DEPUTY PRIME MINISTER'S OFFICE
FOR INVESTMENTS AND INFORMATIZATION
OF THE SLOVAK REPUBLIC

Deputy Prime Minister's Office for Investments and Informatization of the Slovak Republic

The methodology for evaluating synergic effects of the ESIF within context of the Europe 2020 Strategy

Final Report
final version

OPTP operačný program technická pomoc

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Contents

Summary

Description of the document

This document is the final report to evaluation methodology of ESIF synergies in the context of Strategy Europe 2020. The report focuses on the evaluation methods used in pilot projects and other assessments as well as establish system of indicators and methods for contribution to evaluation of ESIF to the Europe 2020. This Methodology focuses on the synergy and impact of interventions planned under ESIF.

The final report is the third output on the Contract No. 690/2016 (Annex No. 1 - Specification) and introduce the outcomes of Part 2. A part of this final report is also the Methodological Manual, which is listed as a separate annex.

Purpose of the evaluation

Increased need for efficient use of EU funds in general, putting pressure to enhanced impacts and value added of all activities supported. In this respect, comprehensive evaluation getting more important because it should assess the efficiency, effectiveness and impact of the implementation of the PA / HPs / OPs. It is also important to compare different approaches used by variety stakeholders.

Following the upcoming evaluation under the evaluation plan and its updates pertaining to the programming period 2014 - 2020 was according the Central Coordination Body (CCO) essential to make provision for the preparation of assignment and implementation of future impact assessment, as well as reducing the complexity of assessment and establish a uniform basis for assessing cross-cutting themes (multi-funding interventions, integrated approach, etc.).

Evaluation methods

In accordance with the assignment and report, the main method was a meta-analysis. Meta-analysis is an evaluation procedure that combines the results of existing studies and evaluation reports. A meta-analysis use different evaluation approaches (qualitative and quantitative) to allow for a comprehensive insight into the studied topic.

This report as well as methodological manual were created based on published analyses and evaluation reports. The main sources of information were (i) pilot evaluations of impacts of SF and CF 2007-2013 (education, research and development, sustainable development, climate change and energy sustainability), (ii) other relevant studies and evaluations carried out in this area (eg. HERMIN evaluation of the impact of ESF interventions on social inclusion, assessment of OPs in the previous programming period), (iii) EVALSED manual published by the European Commission, (iv) assessment reports for the 2007-2013 programming period (v) strategic and methodological documents related to the implementation ESIF, (vi) interviews with experts who carried out pilot assessment and evaluation of operational programs, as well as interviews with MA / IB experts, and (vii) articles dealing with the evaluation of cohesion policy.

Evaluation results

Main results are (a) a methodological guide for evaluation of Europe 2020 goal achievements, and (b) synergy matrix. In addition, methodological manual and synergy matrix are answers to the evaluation questions.

Matrix of synergies are a separate chapter no. 6 and 7 within methodical manual. In principle they are guide in relationship among the objectives of Europe 2020, thematic objectives and EU guidance. Relationships are described in the matrix through areas of intervention, the financial allocations as well as evaluation indicators.

A detailed description of the methods recommended for the evaluation of the achievement of the Europe 2020 objectives is described in Chapter 2. This chapter also summarizes the strengths and weaknesses of different evaluation approaches and their potential risks and solutions.

Methodological manual mission

Manual should help the user to solve two basic groups of questions:

- How to identify synergies between smart, inclusive and sustainable growth?
- How to map, quantify and evaluate the synergic effects of interventions (positive or negative), and causation?

Methodological manual contains: (1) a combination of applicable quantitative and qualitative approaches suitable for assessing priorities of Europe 2020, (2) output and outcome indicators for assessment, and (3) differential analysis (Gap Analysis).

Suitable combinations of evaluation methods and output indicators as well as the gap analysis are described in Chapters 3, 4 and 5. All are separately specified for smart, inclusive and sustainable growth. These chapters also reported general methodological conclusions and recommendations for smart, inclusive and sustainable growth.

List of abbreviations, figures, tables, literature and authors are in annexes.

1 Introduction and structure of the report

The final report is divided into six chapters, which purpose is as follows:
The first chapter - 'Introduction' present objectives and structure of the study.
The second chapter - 'The objectives of the assessment, subject assessment and evaluation questions' define evaluation questions no. 1 and 2 .
The third chapter - 'Background, methodology and evaluation process', describes the approach to the evaluation, methodology and information sources.
The fourth chapter - 'The results of analyses, findings, conclusions and recommendations' describes the evaluation procedure, provides answers to the evaluation questions, presents a Gap Analysis as well as positive and negative findings. In addition comprehensive recommendations to effective use of Methodological manual are described.
The fifth chapter 'Authors' presents the expert team who prepared the study.
The sixth chapter - 'Annexes' contains lists abbreviations, documents for evaluation and bibliography.

The Methodological Manual is a separate part of the Final report.

2 Targets and subject of the evaluation and evaluation questions

2.1 Target, subject and tasks of the evaluation

The aim of the evaluation was to identify a set of indicators and analyses necessary for evaluating achievement of the Europe 2020 objectives and also select the appropriate level of program structure, where effects will be detected, to take account of the results that have a synergy effect on the attainment of common European objectives at national level.

It has been assessed meta-analysis of evaluations already made, by which methodological recommendations for the contributions assessment of ESIF priorities to Europe 2020 through thematic objectives, investment priorities, operational programs including OP Fisheries and Rural Development Programme will be proposed. The common objectives of the Strategy Europe 2020 at the national level provide a quantitative values to the Slovak Republic till 2020.

2.2 Evaluation questions

In accordance with the subcontract for work no. 690/2016, the main task of the evaluation was 'to evaluate the possibility of assessment of synergies and the impact of interventions planned under ESIF in relation to the Strategy Europe 2020'. Methodological manual is a Annexed of this study. Annex is in line with the overall assessment questions. Manual also contains analysis of the optimal, available and necessary data (Gap Analysis) for each growth priority.

Two basic questions were analysed by the following methodology:

- How the ESIF are involved in the fulfilment of national goals of the Europe 2020, mainly related to the smart, inclusive and sustainable growth?
- How synergy effects and impacts of ESIF interventions to Europe 2020 may to be assessed?

The Initial report for this project contains detailed descriptions of the target, subjects and evaluation questions.

3 Recourses, methodology and process of evaluation

3.1 Recourses and general approaches to evaluation

The process and methods of evaluation of cohesion policy passed and undergoing development. Standard methods for assessing socio-economic development with a special focus on assessing the European Union cohesion policy are described in the material EVALSED published in 2004. The study was prepared by the European Commission - Directorate General for Regional Policy with contribution of experts from Maastricht University and Aston Business School. An important source of information for the evaluation is also the document the European Commission for the period 2007 - 2013 (Working Document No 5: Indicative Guidelines on Evaluation Methods: Evaluation during the programming period).
The updated Manual contains provisions for the evaluation during programming period 2014 - 2020. A key source of information is being manual and other information published by the European Commission on webpage dedicated to the exchange of experience with the impact of cohesion policy (EVALSED: The resource for the Evaluation of Socio-Economic Development - Evaluation Guide). EVALSED manual recommends the following types of assessment methods:

- analysis of literature to the effect of socio-economic policies;
- survey;
- econometric and / or statistical modelling;
- participative methods, including interviews and focus groups;
- case studies;
- indicators based on contextual data and / or administrative data provided by public institutions.

Currently the Commission Guidelines on Monitoring and Evaluation - European Regional Development Fund and the Cohesion Fund is document with direct approaches and framework for evaluation. Its aim is to focus on the results of the external factor analysis (positive or negative).
Evaluation results necessarily depend on the whole complex of external factors. In order to evaluate the success of the funds interventions it is required a combination of methodological approaches and analysis of the situation from different perspectives (for more information see Bachtler et al 2013). In other words, there is no ideal approach that would guarantee the result. All methods and approaches have own strengths and weaknesses. High quality assessment therefore needs to: (1) adapt to the particular topic/question/context, (2) wherever possible, analyse the situation from different perspectives by using different methods (triangulation), (3) the cost of evaluation must be proportionate to the expected results.
The first primary issue within the process of funds evaluation is the comprehensiveness of the situation. It is because of the large amount of external factors that influence achieved results. Next issue regards to the time horizon. Interventions in such comprehensive areas such as education, social inclusion or growth are seen with longer time lapse. The third primary issue is availability of data and definition of basic situation (so called Baseline). This is finding what was the situation before the interventions

started to change it. It is beneficial to use to main principals that are mutually compatible and complementary within the evaluation of synergic effects of ESIF:

- *Theory-based impact approach:* Evaluation is based on the interventions logic and it is aimed at the mechanisms that led to observed changes while it should provide answers to questions why, how and what was the context in which interventions functioned.
- *Counterfactual impact approach:* Evaluation is based on control group and its main aim is to search for answers to the question how was the influence of interventions to the change. It simultaneously helps to compare effects of various actions through the analysis of their functioning in different conditions.

The theory-based evaluation of results provide important information that are not based only on quantifiable information, but include also deeper analysis of actions functioning, respectively not functioning and which of the factors and circumstances influence interventions results. Counterfactual evaluation of results can complements and extends situation analysis in the way when it provides more comprehensive information about the situation in supported and non-supported subjects, alternatively territorial areas. Although this method does not have universal application, in appropriate combination with the results evaluation based on the theoretical background it allows to provide complete and comprehensive evaluation.

Policies focused on socio-economic issues usually combine various types of interventions within specific sector or territory. These interventions have roots in various areas of economic and social politics, such as research, development and innovation, education, professional training politics, etc. Specific interventions have own objectives, actions and indicators. The evaluation of objectives in strategic documents therefore meets with two types of issues:

- How to evaluate comprehensive list of mutually influencing interventions?
- How to assess not only the contribution of specific interventions, but also their synergic effects?

The evaluation of comprehensive socio-economic issues has to consequently take into account the current application of several evaluation methods. As we describe in the introduction, it refers to the search for optimal combination of quantitative and qualitative methods with the use of their strengths.

Quantitative methods allows objective measuring and statistical, mathematical or numerical analysis of allocated data[1]:

[1] Deeper discussion to quantitative and qualitative methods is in: EVALSED Guide, Chapter 4: Choosing methods and techniques, pp. 73-90. European Commission (2014): Programming period 2014 - 2020: Guidance document on monitoring and evaluation - European Regional Development Fund and Cohesion Fund–Concepts and Recommendations. Brussels: Directorate General Regional and Urban Policy, March 2014.

- They allow results aggregation on the level of actions and/or operational programmes.
- They allow to use methods of exploration analysis and predictive modelling (for example regression analysis, time series analysis) and also accept judgments about causal relations.
- They create basic overview on the issue and in this way inform follow-up qualitative analysis.
- They help identify size of the intervention effect and accept judgements about the adequacy of costs/benefits of interventions.
- They enable recognise important trends and monitor key indicators connected to socio-economic issues.

Qualitative methods allows detail analysis of socio-economic issues and effects of interventions:

- They help to identify causal context.
- They enable differ effects of interventions for specific groups of recipients.
- They enable detail analysis of specific processes that cannot be researched by quantitative methods.
- They help to clarify interventions context and differentiate intervention effect and effects of external factors.
- They use analytical methods of the type 'bottom-up" within the comprehensive phenomenon. There are often mixed activities and interests of stakeholders with intervention effects in such phenomenon.

An ideal evaluation should start with the analysis of possible approaches and selection of suitable combination of quantitative and qualitative methods that have greater potential to provide data and information needed for the subject of research and evaluation questions. At the same time chosen methodology has to serve for the situation analysis from various perspectives and allows triangulation of data. Conducted evaluation is not the objective, but only a tool.

3.2 Evaluation methodology

Creating matrices of synergies
Each operational programme consists of description of the performance framework, indicators of results at the level of specific objectives and output indicators at the level of investment priority and category of region within the priority axes. Categories of intervention are assigned to the codes according to Commission Implementing Regulation No. 215/2014 and financial allocations.
Categories of intervention are assigned to the codes according to Commission Implementing Regulation No. 215/2014 and financial allocations.
Financial allocations are in some cases broken down by type of region (the more or less developed regions). Assessment was done by combined allocations for both kind of regions. Financial allocations were specified by the European Commission.

Intervention categories with financial allocations are broken down to the level of priority axes (but not the investment priorities) in the operational programs. In some cases, the names of investment priorities are identical to categories of intervention. In other cases, the identification of interventions with investment priorities was carried out based on specific objectives and description of the activities. In these cases, the identification was verified via interviews with experts who participated in the preparation and evaluation of the Partnership Agreement as well as Operational programs for the period 2014-2020.

The strategy Europe 2020 is broadly defined complex framework but not only priorities and common goals, but also integrated guidelines, initiatives, the Council recommendations to individual Member States, etc. The evaluation methodology focuses mainly on the priorities and objectives of common European strategy on the national level. Individual operational programs ensure the fulfilment of the 11 thematic objectives set for ESIF (GR no. 1303/2013. Art. 9). The objectives are described within the Partnership Agreement in more details. A certain proportion of allocation (40% of the total contribution from the European Commission) is not aimed directly on the national targets but contributes to their fulfilment indirectly, through the thematic objectives. Special category called 'allocation within priority but outside national goal" was created to each growth priority.
All operational program include allocations for technical assistance (TA, areas of intervention 121-123). In some cases, technical assistance is addressed to ensure the fulfilment of the objectives of thematic goals. TA is included proportionally in the financial plans of the Operational Programmes.
Allocations under the national targets have been assigned a combination of output and outcome indicators. If only one indicator was defined under the investment priority, this indicator was automatically assigned to matrix of output and outcome indicators. In the case of a few indicators were defined under priority axes, indicator that best describes the nature of the intervention was used for further analysis. The same approach was also used in the selection of output indicators. The most appropriate indicators were identified via interviews with experts participated in the preparation and evaluation of the Partnership Agreement and operational programs for the period 2014-2020 as well as the results of evaluation of objectives EU 2020 as defined in section 3.2.2 of the report.

Financial allocation of Rural Development Programme (RDP) and Operational Programme Fisheries (OP RF) are defined specifically:

- Allocation in the Rural Development Programme is placed on the priority level (P2 to P6). In assigning individual allocations we relied on the Financial Plan RDP 2014 - 2020. Allocations at national priorities (goals) represent sum or codes combination of measures (M01 and M20) and focus areas (F0), respectively. Investment priorities P2 and P6 with overlap to growth priorities were identified for RDV. From defined outputs M01 and M19 were to each investment priorities assigned relevant outputs.
- The Operational Programme Fisheries has financial allocations derived from the relevant Regulation European Parliament and Council (EU) no. 508/2014. Performance framework of this OP has been defined under Chapter 7.

As for the OPF and RDP, technical assistance was calculated proportionally.

Preparation and drafting methodological manual

The meta-analysis was the main method used for creation of Manual.

The meta-analysis is an approach combining outputs of existing studies and evaluation reports through collecting, categorization a evaluation of received information from variety sources. A meta-analysis using different evaluation approaches (qualitative and quantitative) to allow for a comprehensive insight into the studied object. The underlying assumption is that each conceptually similar study contain relevant results and conclusions, but it also can contain varying degrees of mistakes. Verification of studied topic can be done by means of meta-analysis. The advantage of the meta-analysis is to identify the effects and impacts.
It is important correct synthesis, based on the comparison and elimination unverified, marginal, or unsubstantiated conclusions.
A meta-analysis proved as a key instrument in the planning of new studies. It can help in identifying research questions (for example, by identifying what is already clear and what should be examined). It also helps in identifying optimal research methods and approaches that can deliver quality results.
The disadvantage of meta-analysis is that it can narrow down research scope. Therefore, in practice another methods like Grounded Theory is used. In this case qualitative research and the comparison of results takes place at the final stage.
In practice, each of the methods have its own pros and cons, so that combination of methods seems to be a suitable approach. Manual was processed in parallel along two lines. First one, meta-analysis were prepared, Second one, qualitative field research according to identified research questions was carried out. After the initial phase, a meta-analysis and qualitative data were then linked, triangulated (that create base for report and manual).
Qualitative research was undertaken based on research questions. Pool of respondents were selected using by so called snowball method. It is a type of non-probability sampling for highly diverse respondents, ensuring different perspectives and views on the subject under consideration. Due to high complexity of the project it was crucial to work with respondents from different organizations (academia, experts of managing authorities). This approach has the disadvantage that it can focus the research only one of the social and professional group. In order to minimalize negative effect Stratified Purposeful Sampling was used for selection of three main groups of respondents: workers of central state administration bodies, academics and professional assessors. They were subject of chain reference selection.
The main approach has been an in-depth semi-structured interviews. Based on the objectives of the research, questionnaire was prepared. Questionnaire was continuously optimized (from interview to interview).
Specific variation and ideas received during interview were triangulated with the views of other respondents.
Because of high sensitivity of the research topic, anonymity of all respondents have been guaranteed. Therefore interviews were not tape recorded. Only written records were created and always after the interview analysed and processed into complex points which later formed final report.
The result of a meta-analysis necessarily depends on the availability, selection and quality of the studies analysed. Meta-analysis prepared correctly but by inappropriate sample inevitably leads to poor quality results. It is therefore important to choose the analysis reports and studies that provide reliable information and data (Cornell and Mulrow 1991 Wilson and Lipsey 2001).

In preparing meta-analysis, incorporation criteria was defined according theory and research questions. Available reports, evaluation studies and articles focused on evaluation of cohesion policy were mapped and included in the list for the meta-analysis. Criteria included: 1) relevance: whether report or study is relevant to the investigated topic and/or whether subject (country) is comparable, 2) recent origin: whether data and results are still relevant, 3) significance: whether documents are relevant for policy making and/or quoted in academic research.
An overview of the most important evaluation methods used in assessing cohesion policy are set out in Chapter 2 of the manual. Practical examples of the use of these methods for the evaluation of smart, inclusive and sustainable growth are presented in Chapters 3, 4 and 5 of the manual.

An important part of preparing meta-analysis was to assess the pilot evaluation projects from the years 2014-2015 carried out for the needs of the Slovak Government, that are specifically focused on education, science and research, sustainable growth and the elimination of regional disparities. These evaluations were based on the Commission's recommendations for the programming period 2014 - 2020 and built on a combination of quantitative and qualitative approaches that have the greatest potential to provide data and information necessary for the research subject and evaluation questions. Using different methods also enable triangulation of data. The emphasis was put on results and analysis of other factors that affect them and in this context, the impact on achieving value (positive or negative). For the analysis of results and external factors, quantitative analysis with qualitative analysis were combined with using the methodology of field sociological research.

3.3 Information sources

The main sources of information for evaluation and creation of final report were:

(I) the pilot evaluations of synergies SF and CF 2007-2013 (education, research and development, sustainable development, climate change and sustainable energy)
(II) other relevant studies, analysis and evaluations carried out in this area (eg. HERMIN, evaluation of the impact of ESF interventions on social inclusion, assessment of OPs in the previous programming period)
(III) EVALSED, manual of evaluation methods published by the European Commission
(IV) assessment reports for the 2007-2013 programming period
(V) legislative, strategic and methodological documents relating to the implementation of ESIF.
(VI) interviews with evaluation experts participated at pilot assessment and evaluation of operational programs, as well as interviews with experts of managing authorities and implementation bodies RO / SO.
(VII) scholarly articles related to assessing cohesion policy

List of sources is provided in Chapter 6 of this report and in Chapter 10 in the Methodological manual.

4 Results of analyses, findings, conclusions and recommendations

4.1 Evaluation process

The evaluation consisted of two phases:

- Phase 1 of evaluation focused on the development of matrix of national and European objectives and investment priorities
- Phase 2 of evaluation was focused on development of methodological manual for the evaluation of synergies and the impact assessment of interventions planned under ESIF.

4.1.1 Phase 1 of the evaluation

Phase 1 evaluation focused on the development of matrix of national and European objectives and investment priorities. In accordance with an initial report, evaluation procedure consisted of the following stages:

- Goal definition, defining a basic framework, rules and principles
- Processing of methodological approaches
- Preliminary analysis of important documents (Partnership agreement, all operational programs, as well as evaluation reports named in section 3.2 Report)
- Analysis of qualitative data and knowledge. Systemization (matrix showing relevance) of the contribution of the Operational programs ESIF including OP Fisheries and Rural Development Programme for 8 national goals and the three priorities of the Europe 2020 Strategy. Analysis of investment priorities in order to identify their relevance to national targets according to the priorities of the strategy Europe 2020.
- Systemization (matrix showing relevance) of the contribution of the Operational programs ESIF, including OP Fisheries and Rural Development Programme for 11 thematic objectives of the Partnership agreement.
- Analysis of investment priorities in order to identify their relevance to the thematic objectives of the Partnership agreement.
- Quantifying the contribution ESIF based on planned spending of the investment priorities.

Phase 1 evaluation was conducted in the months of July to October, 2016. Phase 1 output are Matrix of national and European objectives and investment priorities. These matrices are part of the research question 1 and are included in the Methodological manual (chapters 6 and 7).

4.1.2 Phase 2 of the evaluation

Phase 2 evaluation was focused on development of methodological manual for the evaluation of synergies and the impact assessment of interventions planned under ESIF. This phase consist of following activities:

- Conducting field research (interviews with experts): discussion of the strengths and weaknesses of different approaches, potential risks and solutions
- Processing and analysis of lessons learned
- Summary of lessons learned from the evaluation of interventions in the programming period 2007-2013 in relation to the programming period 2014 – 2020
- Propose applicable combination of quantitative and qualitative approaches: propose the most appropriate method for the single priorities of the Europe 2020 and the ways in which data and information can be complemented and triangulated. The proposal covers all growth priorities.
- Creating a set of outcome indicators from list of measurable indicators accompanied by other administrative data that is relevant to the assessment ESIF in relation to national targets of Europe 2020, that explain changes and intervention logic (e.g. environmental statistics, economic statistics, etc.). The suggested indicators reflect investment priorities that contribute to specific national targets.
- Gap Analysis, determination of optimal data for the evaluation in the period 2014 – 2020 from national Statistical Office, surveys and interviews, as well as existing data from ITMS2014+ (data collected through the monitoring system) were investigated.
- Processing and systematization of knowledge in the context of the Europe 2020: national targets for smart, inclusive and sustainable growth. They were divided into categories of interventions with strong, medium and weak relevance to the given priority.
- Production of the first version of the evaluation report and the methodological manual.
- Incorporation of comments, processing and editing the final version of the report and the methodological manual.
- Processing of the English version of the final version of a methodological manual

Phase 2 evaluation was carried out in August to December 2016, and its output is Methodological manual (evaluation question no. 2). All activities were coordinated by central co-ordination body (CKO). A detailed work plan for phases 1 and 2 is given in Annex 5.1.

4.2 Answers to the evaluation questions

4.2.1 Evaluation question No. 1

Evaluation question No. 1: How ESIF interventions are involved on fulfilling national targets of the Europe 2020 and the main goals of smart, inclusive and sustainable growth?
The initial report stated that the issue will be analysed by synergy matrix methodology that characterize (a) the contribution of the operational programs ESIF (including OP Fisheries and Rural Development Programme) to 8 national targets and the three priorities of the Europe 2020 strategy, and (b) the contribution of the operational programs ESIF, (including OP Fisheries and Rural development Programme) to national priorities as well as ESIF areas of interventions for the period 2014 - 2020 in Slovakia (in line with the 11 thematic objectives of PA).
Answer to the evaluation question is a synergy matrix in Table A a B bellow. These matrix are also part of the Methodology Manual.

Both matrices summarise in column financial allocations (in €m) into national targets of Europe 2020 and also in activities that, while not fulfilling national targets directly, but serve the achievement of thematic objectives. Description of the objectives is in the explanatory note under the table. The matrix in Table A in the lines is identifying allocation of all operational programs investment priorities including Rural Development Programme. The matrix in Table B presents the allocation to different thematic objectives.

Table A: The matrix of synergies by the operational programmes, priorities of growth national targets of the EU 2020 Strategy and financial allocations

The EU 2020 targets / Investment priorities	SG O	SG 1	SG 2	SG3	SUG O	SUG 4	SUG5	SUH 6	ING N	ING 7	ING 8	Total
OPRI 1.1				856.43			6.23					862.66
OPRI 1.2	199.42			538.11		51.24						788.77
OPRI 2.1				119.83			2.13					121.96
OPRI 2.2	6.00			14.92		1.42						22.33
OPRI 3.1	118.21			25.07		24.40					5.60	173.28
OPRI 3.2	176.54											176.54
OPRI 3.3	26.60											26.60
OPRI 4.1	21.67			0.99		1.98						24.63
OPRI TA	17.48			49.56		2.52	0.27				0.18	70.00
OPHR 1.1		221.45										221.45
OPHR 1.2										97.67		97.67
OPHR 1.3			84.55									84.55
OPHR 1.4										55.07		55.07
OPHR 2.1										194.35		194.35
OPHR 3.1										694.42		694.42
OPHR 3.2										66.50		66.5
OPHR 3.3										35		35.00
OPHR 4.1										152.21		152.21
OPHR 4.2											142.48	142.48
OPHR 5.1		40									99	139
OPHR 6.1		50.05			41.27				106.48		30.81	228.61
OPHR 6.2										15.05		15.05
OPHR TA		10.04	3.13		2.03				4.57	48.43	10.40	78.6
OPQE 1.1					402.88							402.88
OPQE 1.2					497.84							497.84
OPQE 1.3					150.60							150.6
OPQE 1.4					390.45							390.45
OPQE 2.1					419.35							419.35
OPQE 3.1					260.90							260.9
OPQE 4.1								168.98				168.98
OPQE 4.2						110.00						110.00
OPQE 4.3						351.42						351.42
OPQE 4.4						123.47						123.47
OPQE 4.5						185.00						185.00
OPQE TA					53.38	19.37		4.25				77
IROP 1.1										298		298

IROP 1.2							123					123
IROP 2.1									492.91			492.91
IROP 2.2		105								158		263
IROP 3.1	60.9									154.96		215.86
IROP 4.1						111.39						111.39
IROP 4.2					55							55
IROP 4.3					33.33							33.33
IROP 5.1											100	100
IROP TA	2.23	3.85			3.24	4.08	4.51		18.06	22.38	3.66	62
OPII PA1 7i							545.84					545.84
OPII PA1 7iii							180.00					180.00
OPII PA2 7i										1 142.5		1 142.5
OPII PA3 7ii							322.31					322.31
OPII PA4 7i							116.45					116.45
OPII PA5 7d							282.23					282.23
OPII PA6 7a										175.42		175.42
OPII PA6 7b										309.33		309.33
OPII PA7 2a	277.75											277.75
OPII PA7 2b	10.00											10.00
OPII PA7 2c	517.76											517.76
OPII TA	18.06						32.45			36.49		87.00
OPEPA 1.1	234.1											234.1
OPEPA 2.1	33.21											33.21
OPEPA TA	11.14											11.14
RDP P2	261.86				16.58							278.43
RDP P3	244.63				51.95							296.58
RDP P4					560.09		106.73					666.83
RDP P5					14.25							14.25
RDP P6									166.56	77.98		244.54
RDP TA	20.01				25.4		4.22		6.58	3.08		59.29
OPF ST 2.2	7.24											7.24
OPF ST 2.3					2.17							2.17
OPF ST 3.1	0.7											0.7
OPF ST 3.2	0.7											0.7
OPF ST 5.1	2.02											2.02

OPF ST 5.2	2.02											2.02
OPF TA	0.8				0.14							0.94
Total	**2 271.05**	**430.39**	**87.6**	**1 604.91**	**3011.6**	**986.29**	**1 726.37**	**173.2**	**764.3**	**3 736.84**	**392.1**	**15 184.8**

SG O = Smart Growth outside the National Targets; SG 1 = dropout rates under 6%; SG 2 = tertiary education: 40%; SG 3 =Research and Development: GERD 1.2% GDP, SUG O = Sustainable Growth outside the National Targets; SUG 4 = Energy efficiency and decreasing energy consumption Mtoe; SUG 5 Cutting CO2 emission: 13%; SUG 6 Renewable resources: 14%; ING O = Inclusive Growth outside the National Targets; ING 7 = Employment rate: 72%; ING 8 = Decreasing share of population at the risk of poverty.

Table B: The matrix of synergies by the thematic objectives, priorities of growth national targets of the EU 2020 Strategy

The EU 2020 targets / Investment priorities	**SG O**	**SG 1**	**SG 2**	**SG3**	**SUG O**	**SUG4**	**SUG5**	**SUH 6**	**ING N**	**ING 7**	**ING 8**	**Total**
TO1	212.0			1578.0		56.0	8.6					1854.6
TO2	823.6								86.6			910.2
TO3	893.9			26.9	71.1	28.1					5.8	1025.7
TO4					14.8	902.2		173.2				1090.2
TO5					697.4		111.0					808.3
TO6					2154.1							2154.1
TO7							1606.8			1972.7		3579.4
TO8	63.1									1268.6		1331.7
TO9		91.9			74.2				677.7	173.5	386.3	1403.6
TO10		338.5	87.7							322.2		748.3
TO11	278.5											278.5
Total	**2271.0**	**430.4**	**87.7**	**1604.9**	**3011.6**	**986.3**	**1726.4**	**173.2**	**764.3**	**3736.9**	**392.1**	**15184.8**

TO1 = Strengthening research, technological development and innovation, TO2 = Enhancing access to, and use and quality of information and communication technologies, TO3 = Enhancing the competitiveness of small and medium-sized enterprises (SMEs) (including EFARD) and the fishery and aquaculture sector (including EMFF), TO4 = Supporting the shift towards a low-carbon economy in all sectors, TO5 = Promoting climate change adaptation, risk prevention and management, TO6 = Preserving and protecting the environment and promoting resource efficiency, TO7 = Promoting sustainable transport and removing bottlenecks in key network infrastructures, TO8 = Promoting sustainable and quality employment and supporting labour mobility, TO9 = Promoting social inclusion, combating poverty and any discrimination, TO10 = Investing in education, training and vocational training for skills and lifelong learning, TO11 = Enhancing institutional capacity of public authorities and stakeholders and efficient public administration.

The matrix distributes also the proportional part of the technical assistance

4.2.2 Evaluation question No. 2

Evaluation question No. 2: How can be assess synergies and the impact of interventions planned in the ESIF in relation to the Europe 2020?

The initial report stated that the issue will be analysed by summarizing of the application of knowledge gained from evaluation of interventions in the programming period 2007 - 2013 in relation to the programming period 2014 - 2020, including experience with data collection and subsequent analysis. The methodology should determine:

(a) proposing applicable combination of quantitative and qualitative approaches,
(b) developing a set of performance indicators from the list of measurable indicators.
(c) carrying out an assessment by Gap Analysis.

Answer to the evaluation question is an methodological manual, which is a separate annex of the final report.
Assessment by the Gap Analysis is carried out in the next chapter.

4.3 Gap Analysis, positive and negative findings from the outcomes of analyses

This chapter analyses sources and availability of data needed for the achievement of the national targets of the Europe 2020 Strategy, and synergic effects arising between the growth priorities

4.3.1 Data sources and data availability for the smart growth

The data for evaluating of achievement of national targets set by the Europe 2020 Strategy and specification of synergies between the growth priorities are available on the project level (output indicators) and regional levels (result, impact and context indicators).

Indicators for analysing target 'decreasing rates of early school leavers under 6% by 2020'
The Eurostat is the prime resources for data on the result and context levels. An analysis of factors determining achievement of the target indicated a crucial role of the socio-economic background of the students' parents. The Statistical Office of the Slovak Republic (SOSR) provides data on the district level. Data on economic, social, and demographic indicators are available (education attainment, average wage, divorce rates). The Central Office of the Labour, Social Affairs and Family (COLSAF) provides data on the unemployment, social benefits and material deprivation. The Slovak Centre for Scientific and Technical Information (SCSTI) provides data on the drop-out rates and numbers of teachers. The Ministry of Education, Science, Research and Sports (MESRS) provides data on financial support to education from the national and European resources.
The pilot evaluation of the target in education focused on the demand-driven projects. These projects generated most data on the regional levels. The National Projects, however, accounted for significant part of the total support from the European resources. The future evaluations may benefit from data specifying proportional allocations by the national projects on the beneficiary levels. It will help quantifying amount of resources received by the beneficiaries both from the demand-driven and national projects.

There is an interesting opportunity to evaluate results of the interventions on the project level. The projects targeting marginalised communities and/or districts with high incidence of the social exclusion should report students' achievements before and after implementation of the project. In the same time, data on social and economic situation of students' parents should be collected. The data requirements should be added to particular calls.

Indicators for analysing target on 'population with the tertiary attainment'
The Eurostat and SOSR are key data providers for the data on the target. The data refer to total population and educational attainment in the age-specific group 30-34. Data on the demographic structure of the Slovak population (provided by the SOSR) and data on students and higher education institutions (provided by the SCSTI) are important for prediction of target on tertiary attainment.
The project-level data should indicate numbers of students, who benefited from the ESIF in specific investment priorities.

Indicators for analysing target 'research and development' in the Europe 2020 Strategy.
The Eurostat and SOSR are key data providers for the data on the target on the result and context levels. The data concern gross expenditure on research and development (GERD) and breakdown of GERD by source of funds and sector of performance. The abovementioned data, however, do not allow to specify, whether the support from the national and European resources had complementary or substitute effect on firms' own expenditure on R&D (Business expenditure on research and development, BERD).
The business sector should provide 2/3 of the total GERD by 2020. It is therefore very important to know, whether the support from the national and European resources had complementary or substitute effect on BERD. The SOSR provides aggregate data on the BERD. Data on firm level currently are not available. It is currently impossible to know whether the support from the national and European resources had complementary or substitute effect on the BERD. The businesses applying for the European support should report following data:

- The structure of BERD, broken down on research and development;
- The history of BERD in nominal terms and relative terms (BERD / turnover) .

The Managing Bodies should also provide data on the national public support to business in the past (grants by the SRDA agency, amount R&D stimuli, the grants from the Structural and Cohesion Funds in programming period 2007 - 2013).

Indicators for analysing synergies between the targets and priorities of growth
The following data resources are suggested for analysing synergies on the macro level:

- The Data Envelopment Analysis (DEA) traditionally is used for the country-level multi-criterial evaluation in all three priorities of growth. The DEA can be applied also for evaluating synergies between the smart growth and inclusive growth, and smart growth and sustainable growth. The DEA provides context indicator for the evaluation. The DEA would suggest how far the Slovak Republic from the efficiency frontier is, and which combinations of the growth priorities should pre preferred in the future. The Eurostat provides data needed for the DEA analysis. The DEA data de facto are indicators of the Europe 2020 Strategy.

- The analysis of the economic growth via the production function (the Cobb-Douglas function) is appropriate for describing synergies between the smart growth (in terms of the Total Factor Productivity, TFP) and the inclusive growth (in terms of increase in numbers and skills of the labour force). The SOSR and the AMECO macroeconomic database of the European Commission provide data needed for the analysis of the economic growth via the production function.

As for the micro-level, the synergies between the smart and sustainable growth are of interest. The output indicators O0072 (number of IPR applications) and O0073 (number of patent applications) enable for distinguishing, whether the eco-innovations were project outputs.
The synergies between the smart and inclusive growth are harder to spot on the micro-level, as the technology-intensive investments used to decrease demand on labour. The output indicator CO08 (increase in employment in firms benefiting from the support) may not provide a realistic assessment of impact by new technologies on employment. It is better to use the production function on the macro-level.

4.3.2 Data sources and data availability for the inclusive growth

Indicators for the analysis of the objective 'average employment rate in the age group 20-64 years 72% by 2020 '
Within the Partnership Agreement (2014 - 2020), there are basically two approaches leading to the fulfilment of the national target of employment rate in the age group 20-64 years 72% in 2020:

1) investment in human capital (support of a broad spectrum of forms of education of selected population groups, improving labour market functioning and active labour market policies) through the investment priorities of the OPHR and partly IROP. An essential source of data are ITMS2014 + and monitoring reports. Context of economic, social, demographic and administrative data at national resp. regional level are provided by the Statistical Office of the Slovak Republic, Slovak Centre of Scientific and Technical Information. Ministry of Education SR, Central Office of Labour, Social Affairs and Family (COLSAF), Atlas of Roma Communities, as well as those from Social Insurance and municipalities. As the secondary source, we may use respondents providing complementary information or knowledge. It can be project participants: teachers, parents, students, potential employers, government, employees of state / public administration, non-profit sector participants. Character and 'diversity' (heterogeneity and variability) of beneficiaries / target groups as well as indicators of outputs may provide sufficient sources of quantitative and qualitative data.
2) investment in transport infrastructure (motorway and road network) through selected investment priorities OPII and partly IROP. Job creation is foreseen in the implementation of projects of construction / reconstruction of road infrastructure. Yet the OPII output indicators do not provide sufficient information for direct quantification of number of new jobs and their sustainability during and after the implementation of the project.

Missing data can be obtained in the following ways:

a) report, at the project basis, number of jobs created (and their duration) at the level of suppliers and subcontractors (Tiers 2-4) or at the level of firms involved in the projects undertaken. In cooperation with Central Office of Labour, Social Affairs and Family one can detect whether there is an employment generated for risk groups of unemployed (long-term unemployed, young, MRC).
b) the impact of new transport infrastructure on employment growth after implementing the project may be measured ex post based on case studies. Such a monitoring may work with number of jobs in the region before and after the project (structure of the job may be also examined). The primary data source is the Statistical Office of the Slovak Republic or Central Office of Labour, Social Affairs and Family. Additionally, sample surveys may be used.
c) in the case of using econometric methods at the regional level, it is necessary to use more detailed data at NUTS III (regional prices and trade flows between regions) or NUTS IV.

Indicators for analysis of the target to 'reduce the proportion of the population at risk of poverty and social exclusion to 17.2% by 2020"

The share of population at risk of poverty and social exclusion was in 2012 on the level of 20.5%. By 2020 it should, according to the targets of the Europe 2020 fall to 17.2%. Detail description and analysis of this indicator is explained by the Eurostat website. In the Slovak language, we may find its description in the publications of the Statistical Office (Vlačuha and Škápik, P. 2012)) , where it is described and shows how to define the aggregate indicator of poverty or social exclusion based on a multidimensional approach to measuring poverty. Unlike one dimensional indicators reflects the risk of poverty and social exclusion also two others: material deprivation and exclusion from the labour market.

The aim is to complete view using three key sub-indicators:

- ***The risk of poverty:*** at-risk-of poverty in the EU is determined to be 60% of the national median equivalent disposable income. The indicator shows the risk of poverty after social transfers and the proportion of people whose equivalent disposable income is below the poverty line.
- ***Material deprivation rate:*** Indicates the percentage of the population who suffer from an enforced lack of at least four (out of nine) deprivation items.
- ***The rate of low work intensity:*** Share of people living in households with very low work intensity (less than 20%) and in proportion to the total population of the country

Statistical Office (Vlačuha and Škápik, P. 2012) on the basis of EU-SILC 2011 indicates that number of people in Slovakia who were at risk of poverty or social exclusion is 1112200, representing 20.6% of the total population. The share of population at risk of poverty and social exclusion in the following year 2012 reached 20.5%. This was the year and data taken as the basis for target setting. According to EU-SILC, this percentage dropped in 2013 to 19.8%, while in 2014 it went down to 18.4%. It suggests, that the Slovak Republic is on the positive trajectory and has a real chance of achieving the 2020 target set to be on the value of 17.2%. It would be necessary to maintain at least the current levels of economic growth and at least partially overcome structural

barriers that keep part of the population in poverty and social exclusion. The Roma ethnic minority is identified as a priority in this regard.

There are data available at the Statistical Office and the EU SILC for the three sub-indicators (risk of poverty, material deprivation rate, and the rate of low work intensity. As pointed above, there is specific group of the Roma ethnic minority and marginalized Roma communities where a substantial part of the measures in the programming period 2014-2020 is earmarked. Social policy measures here impinge on the availability of data, as the data that has been collected in the Slovak Republic, are not categorized by nationality and ethnicity. On the other hand, targeted measures on social inclusion requires more precise mapping of the target groups. For this reason, in 2004 and 2013 the so-called Atlas of Roma Communities was developed. The latest version is from 2013 and it provides detailed information for the support of inclusive policies.

4.3.3 Data sources and data availability for the sustainable growth

Data necessary for assessing progress towards national target of the Europe 2020 strategy, and the characteristics of synergies between growth priorities, are specified at the project level (outputs) and at the regional and / or country level (the results, the impacts and context indicators). The basic sources of indicators for outcomes and results, as well as for socio-economic context are the Slovak Hydro-meteorological Institute, the Statistical Office of the Slovak Republic (SO SR) and Eurostat. Data and analysis are provided also by the Ministry of Environment and Slovak Environmental Agency. An additional important source of statistics are quantitative data and the Ministry of Economy, as well as information from manufacturers and distributors of electricity and heat.
The best and the most detailed covered area is perhaps production and distribution of energy, energy consumption in transport and in the industry. There are also extensive data available on sources and greenhouse gas emissions. Rather problematic are diffuse sources of emissions from households and quantification of energy savings, where only data at project level are available and we may operate with only proxy indicators, such as household consumption (which however, may be affected by many factors).
The key source of processed data and indicators is the *Enviroportál* (information portal of the Ministry of the Environment). In clear and accessible form an important source of data for the evaluation of interventions.
The Gap Analysis of what data are available and what would need to be added, indicates relatively good sources of data available from the surveys of the Statistical Office, and the Hydro-meteorological Institute, as well as from measurement and research coordinated by Slovak Environmental Agency (SEA). SEA together with the Ministry of Environment operates enviroportal.sk website, which monitors and provides regular updates on development in virtually all key indicators. Monitoring system and data collection at the level of the projects is sophisticated and provides extensive data on each approved project. It would be appropriate to consider some options for improving both technical part of the work with data and information, as well as the proper scope and method of data collection for the projects.
One of the problems in statistical analysis what is the contribution of cohesion policy to energy savings is the fact, that many projects generating energy savings have several

components. For example, in the reconstruction of schools and sanitary facilities, insulation is only one of the several activities. This makes it difficult in mapping precision investment levels in energy efficiency and to get completely accurate figures would require to investigate technical documentation of hundreds of projects. One solution could be that, similarly to the control of the financial side of the projects, there would be also check on the accuracy of data on energy consumption.
In addition, applicants should indicate data not only on the declared energy savings, but also on energy consumption for several years before, and after implementation of the project (eg. an obligation to provide these data to the operator of the monitoring system energy efficiency), while in the context of verification of the savings, the empirically measured savings are compared with the planned (declared) savings. A prerequisite for savings verification and analysis of the effectiveness of utilization of spent finances is division of financial flows (Grant, co-financing, own projects) to (a) the expenditures necessary to implement energy efficiency measures; and (b) for other expenses. So far, such a division is not possible within the ITMS, making it impossible to carry out such an analysis.
The current data collection system does not evaluate the cost-effectiveness of energy efficiency measures. It would be useful to monitor what is capital intensity of energy efficiency measures implemented in each OP, and analyse how the required quantitative objectives can be achieved in terms of economic costs. In this respect, positive change in the current programming period should occur through tracking finances that are directly related to energy saving. These should be monitored at project level and be linked with the monitoring of energy savings to SEIA.
An important part of the evaluation of sustainable growth in the context of the PA targets is analysis of secondary effects. One of the effects of investment in sustainable growth should be job creation and jobs created specifically through environmental investments (i.e. Green jobs). This will require a better definition of this category of jobs. In the same time it opens question, how to monitor and evaluate the jobs affiliated with the whole cycle of implementation and delivery of projects.

4.4 Recommendations

The key recommendation is to use the Matrices of synergies and the Methodological Manual for evaluation of the synergic effects and impacts of interventions planned within the ESIF framework and related to the Europe 2020 Strategy. The recommended combinations of methods and indicators are usable also for the evaluation of achieving targets on the investment priority levels (within the operational programmes and the Rural Development Programme).

The next recommendations include:

(a) To use data specified in the Methodological Manual (in chapters on the data resources and data availability for specific growth priorities) for evaluation of the synergic effects and impacts.

(b) Generating new data for evaluation in case of the data unavailability ('Gap Analysis'). Methods for the data generation are summarised in chapters on the data resources and data availability in the Methodological Manual.

5 Expert team

5.1 Composition of the expert team

Expert name	Role	Position
Ing. Jozef Géci	Project management	other expert, team member
Doc. Ing. Vladimír Baláž, PhD., DrSc	Team leader and Evaluator / analysts	key expert
Mgr. Richard Filčák, MSc. PhD.	Evaluator / analysts	key expert
Ing. Tomáš Jeck, PhD.	Evaluator / analysts	other expert, team member
Ing., Miroslav Balog, PhD et PhD.	Evaluator / analysts	other expert, team member
Mario Rodriguez Polo, MSc. PhD.	Evaluator / analysts	other expert, team member

The team members were responsible for following areas of evaluation

- Vladimír Baláž: smart growth (OPRI and OPHR)
- Richard Filčák: sustainable growth (OPQE, RDP, OPF)
- Tomáš Jeck: synergies between inclusive and sustainable growths (IROP, OPII)
- Miroslav Balog: synergies between inclusive and smart growths (OPEPA, OPRI and OPHR)
- Mario Rodriguez Polo: methodology of evaluation of the smart, inclusive and sustainable growths; translation and editing of the English version of the Manual)

The team members co-ordinated their activities as to identify synergies between the smart, inclusive and sustainable growths.

5.2 Responsible persons of the procurer

The responsible persons of the procurer are involved in receiving and sending documents and reception and acknowledgement of the project outputs.

Persons responsible for contract	Subject	Position / Section / Department
Denisa Žiláková	Deputy Prime Minister's Office for Investments and Informatization of the Slovak Republic	General director of section CCO
Alena Kuruczová	Deputy Prime Minister's Office for Investments and Informatization of the Slovak Republic	Director of the monitoring and evaluation section
Dária Juhásová	Deputy Prime Minister's Office for Investments and Informatization of the Slovak Republic	Manager of the evaluation section
Andrej Chudý	Deputy Prime Minister's Office for Investments and Informatization of the Slovak Republic	Officer of the monitoring and evaluation section, contact person

6 Annexes

6.1 Abbreviations

CCB	Central Coordination Body
EC	European Commission
EMFF	European Maritime and Fisheries Fund
ESIF	European Structural and Investment Funds
EU	European Union
HP	Horizontal principles
OP	Operational program including Rural Development Program
PA	Partnership Agreement
MA	Managing Authority
IB	Intermediate Body
SO SR	Statistical Office of the Slovak Republic
TO	Thematic objective

6.2 References for the evaluation

6.2.1 Cross-cutting evaluations

ÚV SR, (2009). Hodnotenie plnenia cieľov politiky súdržnosti prostredníctvom zvyšovania konkurencieschopnosti, vytvárania pracovných príležitostí a zvyšovania zamestnanosti a hodnotenie dopadu hospodárskej krízy (pre Ministerstvo výstavby a regionálneho rozvoja SR spracoval Consulting Associates, s.r.o.), 97 s., dostupné na: http://www.nsrr.sk/download.php?FNAME=1274166264.upl&ANAME=Hodnotiaca+spr%C3%A1va+za+rok+2009.rar
ÚV SR, (2009). Hodnotenie dopadov krízy na zamestnanosť. (pre Ministerstvo výstavby a regionálneho rozvoja SR spracoval Consulting Associates, s.r.o.), 46. s, dostupné na: http://www.nsrr.sk/download.php?FNAME=1274166264.upl&ANAME=Hodnotiaca+spr%C3%A1va+za+rok+2009.rar
ÚV SR, 2013. Strategické hodnotenie NSRR 2012. (pre Ministerstvo výstavby a regionálneho rozvoja SR spracoval Consulting Associates, s.r.o.) 119 s., dostupné na: http://www.nsrr.sk/download.php?FNAME=1362662435.upl&ANAME=Strategicke_hodnotenie_final_sk.pdf

ÚV SR. 2014. Posúdenie vplyvov politiky súdržnosti na rozvoj Slovenska s využitím vhodného ekonometrického modelu. Hodnotiaca správa 2014. Bratislava: KPMG Slovensko spol. s r.o. dostupné na:http://www.nsrr.sk/download.php?FNAME=1411462847.upl&ANAME=HODNOTIACA_SPRAVA_FINAL_ORI.pdf
ÚV SR. 2015. Pilotný projekt – hodnotenie príspevku EÚ 2020. Hodnotiaca správa 2015. Bratislava: KPMG Slovensko spol. s r.o. dostupné na: http://www.nsrr.sk/download.php?FNAME=1428660233.upl&ANAME=Pilotn%C3%BD+projekt+-+hodnotenie+pr%C3%ADspevku+E%C3%9A+2020+-+Hodnotiaca+spr%C3%A1va+2015+-+FINAL.pdf
ÚV SR. 2015. Metahodnotenie. Záverečná správa. Bratislava: KPMG Slovensko spol. s r.o. dostupné na: http://www.nsrr.sk/download.php?FNAME=1436434573.upl&ANAME=Summary+of+Meta-evaluation.docx
ÚV SR. 2015. Hodnotenie vybraných intervencií ŠF a KF využitím metód Counterfactual Impact Evaluation. Záverečná správa. Bratislava: KPMG Slovensko spol. s r.o. dostupné na: http://www.nsrr.sk/download.php?FNAME=1444742081.upl&ANAME=Hodnotenie+vybran%C3%BDch+intervenci%C3%AD+%C5%A0F+a+KF+vyu%C5%BEit%C3%ADm+met%C3%B3d+CIE+-+Z%C3%A1vere%C4%8Dn%C3%A1+spr%C3%A1va.pdf
ÚV SR. 2015. Kontrafaktuálne metódy hodnotenia dopadov. Prehľad a aplikácia konceptov hodnotenia dopadov intervencií. (ePublikácia). KPMG Slovensko spol. s r.o. dostupné na: http://www.nsrr.sk/download.php?FNAME=1439969875.upl&ANAME=ePublikaciaEU.pdf
ÚV SR. 2015. Hodnotenie informovanosti a publicity v programovom období 2007 - 2013 Záverečná správa (finálna verzia). KPMG Slovensko spol. s r.o. dostupné na: http://www.nsrr.sk/download.php?FNAME=1444742202.upl&ANAME=Hodnotenie+informovanosti+a+publicity+v+programovom+obdob%C3%AD+2007+-+2013+-+Z%C3%A1vere%C4%8Dn%C3%A1+spr%C3%A1va.pdf
ÚV SR. 2015. Pilotný projekt - príspevok k EÚ 2020 - výskum a vývoj Záverečná hodnotiaca správa. KPMG Slovensko spol. s r.o. dostupné na: http://www.nsrr.sk/download.php?FNAME=1444742176.upl&ANAME=Pilotn%C3%BD+projekt+-+pr%C3%ADspevok+k+E%C3%9A+2020+-+v%C3%BDskum+a+v%C3%BDvoj+-+Z%C3%A1vere%C4%8Dn%C3%A1+hodnotiaca+spr%C3%A1va.pdf
ÚV SR. 2015. Pilotný projekt - príspevok k EÚ 2020 - zmena klímy a energetická udržateľnosť Záverečná hodnotiaca správa. KPMG Slovensko spol. s.r.o. dostupné na: http://www.nsrr.sk/download.php?FNAME=1444742778.upl&ANAME=Pilotn%C3%BD+projekt+-+pr%C3%ADspevok+k+E%C3%9A+2020+-+zmena+kl%C3%ADmy+a+energetick%C3%A1+udr%C5%BEate%C4%BEnos%C5%A5+-+Z%C3%A1vere%C4%8Dn%C3%A1+hodnotiaca+spr%C3%A1va.pdf
ÚV SR. 2015. Hodnotenie príspevku implementácie štrukturálnych fondov a Kohézneho fondu na vyrovnávanie regionálnych disparít na Slovensku Záverečná správa. KPMG Slovensko spol. s r.o. dostupné na: http://www.nsrr.sk/download.php?FNAME=1446020437.upl&ANAME=Hodnotenie+pr%C3%ADspevku+implement%C3%A1cie+%C5%A0F+a+KF+na+vyrovn%C3%A1vanie+region%C3%A1lnych+dispar%C3%ADt+na+Slovensku+-+z%C3%A1vere%C4%8Dn%C3%A1+spr%C3%A1va+%28SJ+verzia%29.pdf
ÚV SR. 2015. Analýza vývoja vyrovnávania regionálnych disparít v SR. Finálna správa. KPMG Slovensko spol. s.r.o. dostupné na: http://www.nsrr.sk/download.php?FNAME=1405423840.upl&ANAME=Anal%C3%BDza+v%C3%BDvoja+vyrovn%C3%A1vania+region%C3%A1lnych+dispar%C3%ADt+v+SR.rar
ÚV SR. 2015. Analýza administratívnych kapacít (AK) a efektívnosti subjektov zodpovedných za európske štrukturálne a investičné fondy a AK prijímateľov pomoci. Záverečná správa (Dokument A 'Strategická časť" a Dokument B 'Analýza'). KPMG Slovensko spol. s r.o. dostupné na:

http://www.nsrr.sk/download.php?FNAME=1407919926.upl&ANAME=Anal%C3%BDza_AK_a+efekt%C3%ADvnosti+subjektov+E%C5%A0IF+a+AK+prij%C3%ADmate%C4%BEov+pomoci.rar

6.2.2 Evaluations of the Operational Programmes

Document	Source
Pravidelné hodnotenie operačného programu Výskum a vývoj 2011-2012	Ministry of Education, Science, Research and Sport of the Slovak Republic
Pravidelné hodnotenie operačného programu Výskum a vývoj 2009	
Zhodnotenie správnosti nastavenia systému merateľných ukazovateľov pre operačný program Výskum a vývoj a systému monitorovania operačného programu Výskum a vývoj	
Zhodnotenie relevantnosti cieľov Operačného programu Výskum a vývoj z hľadiska ich plnenia	
Pravidelné hodnotenie operačného programu Vzdelávanie. Záverečná hodnotiaca správa (február 2012)	
Záverečná hodnotiaca správa – Zhrnutie Pravidelné hodnotenie operačného programu Vzdelávanie (február 2012)	
Záverečná hodnotiaca správa. Vyhodnotenie pokroku implementácie operačného programu Vzdelávanie z hľadiska relevantnosti a plnenia cieľov operačného programu Operačný program Vzdelávanie (január 2012)	IBS SLOVAKIA for Ministry of Education, Science, Research and Sport of the Slovak Republic
Záverečná hodnotiaca správa 'Zhodnotenie správnosti nastavenia systému merateľných ukazovateľov a funkčnosti systému monitorovania' Operačný program Vzdelávanie	
Strategické hodnotenie Operačného programu Konkurencieschopnosť a hospodársky rast (február 2013)	IBS SLOVAKIA for Ministry of Economy of the Slovak republic
Pravidelné hodnotenie celého Operačného programu Konkurencieschopnosť a hospodársky rast (február 2010)	Ministry of Economy of the Slovak republic
Hodnotenie čistých efektov absolventskej praxe a podpory pre vykonávanie samostatnej zárobkovej činnosti. Technická správa (2015)	Ministry of Labour, Social Affairs and Family of the Slovak Republic (MLSAFSR Vladimír Bořík, PhD. RNDr. Marek Ďurica, PhD. Mgr. Miloslava Molnárová, PhD.; RNDr. Lucia Švábová, PhD.
Metodika hodnotenia dopadov Operačného programu ľudské zdroje (december 2015)	IBS SLOVAKIA for MLSAFSR
Priebežné hodnotenie celého Operačného programu zamestnanosť a sociálna inklúzia (december 2010)	IBS SLOVAKIA for MLSAFSR
Vyhodnotenie vhodnosti systému ukazovateľov a ich používania v Operačnom programe Zamestnanosť a sociálna inklúzia (január 2010)	Consulting Associates for MLSAFSR
Pilotné hodnotenie dopadov vybraných opatrení aktívnej politiky trhu práce (2013)	Bořík – Caban for MLSAFSR
Metodológia merania dopadov v rámci OP ZaSI tematické hodnotenie	Ministry of Labour, Social Affairs and Family of the Slovak Republic
Ucelené tematické hodnotenie na úrovni jednotlivých prioritných osí OP ŽP a ich prínosu k rozvoju regiónov na území cieľa Konvergencia (november 2015)	KPMG Slovakia for Ministry of Environment of the Slovak Republic
Ucelené tematické hodnotenie ekonomických a sociálnych dopadov OP ŽP na podporované územie cieľa Konvergencia	
Ucelené tematické hodnotenie OP ŽP z hľadiska jeho prínosu k plneniu požiadaviek vyplývajúcich z environmentálneho acquis a dopadov na životné prostredie a verejné zdravie	
Tematické hodnotenie zamerané na identifikáciu ukazovateľov dopadu OP ŽP	

Operatívne hodnotenie Operačného programu Životné prostredie (stav k 30. 09. 2012)	Ministry of Environment of the Slovak Republic
Hodnotiaca správa č. 1/2011 k ad hoc operatívnemu hodnoteniu Operačného programu Doprava 2007 – 2013 s názvom 'Hodnotenie implementácie horizontálnych priorít OPD'	Ministry of Transport, Construction and Regional Development of the Slovak Republic
Hodnotenie aktuálneho stavu, absorpčnej kapacity a rizík Operačného programu Doprava 2007 -2013 k 31. 07. 2012	
Strategické hodnotenie Regionálneho operačného programu	IBS SLOVAKIA for Ministry of Agriculture and Rural development of the Slovak Republic
Pravidelné hodnotenie doterajšej realizácie ROP k 15.4.2010	Ministry of Agriculture and Rural development of the Slovak Republic

6.2.3 List of persons and institutions included into survey

As described in the chapter on evaluation methodology, sampling of respondents for the qualitative part of the research was carried out by a combination of chain reference selection and stratified targeting. For research following three main groups of respondents were identified: experts of central state administration bodies, academics and expert evaluators. Subsequently, they were subject to chain reference selection. Because of high sensitivity of the research topic, anonymity of all respondents (26 in total) have been guaranteed. Therefore, only the numbers are given.
Table: Experts participating in pilot and other evaluations

Expert	**Organisation**
Ing. Karol Frank, PhD.	Slovak Academy of Sciences
Ing. Ivan Lichner, PhD.	Slovak Academy of Sciences
Mgr. Zuzana Poláčková, M. A.	Slovak Academy of Sciences
Ing. Marek Radvanský, PhD.	Slovak Academy of Sciences
Ing. Miroslav Štefánik, PhD.	Slovak Academy of Sciences
Mgr. Tomáš Miklošovič, PhD.	Slovak Academy of Sciences
Ing. Tomáš Domonkos, PhD.	Slovak Academy of Sciences
Ing. Mgr. Daniel Škobla, PhD.	UNDP
Ing. Jakob Hurrle	Charles University, Prague
Jan Grill, PhD.	Manchester University, Veľká Británia

Table: Employees of the central state administration

Structure of programmes	MA/IB	No of interview
Operational Programme Quality of Environment	MA	3
	IB (Ministry of Environment of the Slovak Republic)	3
Operational Programme Human resources	RO	4
	IB (Ministry of Interior of the Slovak republic)	5
	IB (Ministry of Labour, Social Affairs and Family of the Slovak Republic)	4
	MA (Ministry of Education, Science, Research and Sport of the Slovak Republic)	1
Operational Programme Research and Innovation	MA (Ministry of Education, Science, Research and Sport of the Slovak Republic)	3
	IB (Ministry of Economy of the Slovak Republic)	2
	IB IA SIEA	1

6.3 References for the Final Report

Bachtler, G., Begg, I., Polverari, L. and Charles. D. (2013): Evaluation of the Main Achievements of Cohesion Policy Programmes and Projects over the Longer Term in 15 Selected Regions (from 1989-1993 Programme Period to the Present (2011.CE.16.B.AT.015), Final Report to the European Commission (DG Regio), European Policies Research Centre, University of Strathclyde (Glasgow) and London School of Economics.

Bradley, J., Gács, J,. Kangur, A. and Lubenets, N. (2005): HERMIN:A Macro Model Framework for the Study of Cohesion and Transition. Integration, Growth and Cohesion in an Enlarged European Union. New York: Springer.

Charnes, A., Cooper, W.W. and Rhodes, E. (1978): Measuring the efficiency of decision-making units, *European Journal of Operational Research*, 2(4): 429 – 444.

Cooper, W.W., Seiford, L.M. and Zhu, J. (2010): *Data Envelopment Analysis, History, Models and Interpretations*. In Cooper, W.W., Seiford, L.M. and Zhu, J. (Eds): *Handbook on Data Envelopment Analysis* (second edition), Chapter 1, pp. 1 – 38. Springer, New York.

Commission Implementing Regulation (EU) No 215/2014 of 7 March 2014 laying down rules for implementing Regulation (EU) No 1303/2013 of the European Parliament and of the Council laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social

Fund, the Cohesion Fund and the European Maritime and Fisheries Fund with regard to methodologies for climate change support, the determination of milestones and targets in the performance framework and the nomenclature of categories of intervention for the European Structural and Investment Funds.
Cornell, J. E. a Mulrow, C. D. (1999). Meta-analysis. In: H. J. Adèr a G. J. Mellenbergh (Eds). Research Methodology in the social, behavioral and life sciences (pp. 285–323). London: Sage Publicatons.
Council Regulation (EC, Euratom) No. 1311/2013 of 2 December 2013 laying down the multiannual financial framework 2014 – 2020.
Doyle, J.R. and Green, R.H. (2003): Comparing products using data envelopment analysis, *Omega*, 19(6): 631 – 638.
Emrouznejada, A., Parkerb, B.A. and Tavaresc, G. (2003): Evaluation of research in efficiency and productivity: A survey and analysis of the first 30 years of scholarly literature in DEA, *Socio-Economic Planning Sciences*, 42(3): 151 – 157.
European Commission: (2006): Indicative Guidelines on Evaluation Methods: Evaluation during the Programming Period. Working Document No 5. Directorate-General Regional Policy.
http://ec.europa.eu/regional_policy/sources/docoffic/2007/working/wd5_ongoing_en.pdf
European Commission: (2013): Programming period 2014 - 2020: Guidance document on monitoring and evaluation - European Regional Development Fund and Cohesion Fund–Concepts and Recommendations. European Commission, Directorate-General for Regional Policy: Brussels.

Imbens. G.W and Wooldridge, J.M. (2009): Recent Developments in the Econometrics of Program Evaluation. *Journal of Economic Literature*, 47: 5-86.
Nayar, P. and Ozcan, Y.A. (2008): Data envelopment analysis comparison of hospital efficiency and quality, *Journal of Medical Systems*, 32(3): 193 – 199.
Regulation (EU) No 508/2014 of the European Parliament and of the Council of 15 May 2014 on the European Maritime and Fisheries Fund and repealing Council Regulations (EC) No 2328/2003, (EC) No 861/2006, (EC) No 1198/2006 and (EC) No 791/2007 and Regulation (EU) No 1255/2011 of the European Parliament and of the Council.
Sun, S. (2002): Measuring the relative efficiency of police precincts using data envelopment analysis, *Socio-Economic Planning Sciences*, 36(1): 51 – 71.
Talluri, S. (2000): Data Envelopment Analysis: Models and Extensions, *Decision Line*, 31(3): 8 – 11.
Thanassoulis, E. (1993): A Comparison of Regression Analysis and Data Envelopment Analysis as Alternative Methods for Performance Assessments, *The Journal of the Operational Research Society*, 44(11): 1129 – 1144.
Thoemmes, F. (2012): Propensity score matching in SPSS, arXiv preprint arXiv:1201.6385, 2012.
Úrad vlády SR (2014): Pozičný dokument Európskej komisie k Partnerskej dohode a programom SR na roky 2014 - 2020. http://www.nsrr.sk/sk/programove-obdobie-2014---2020/pozicny-dokument-europskej-komisie-k-partnerskej-dohode-a-programom-sr-na-roky-2014---2020/
Úrad vlády SR (2014): Partnerská dohoda 2014 – 2020.
http://www.partnerskadohoda.gov.sk/
Wilson, D. B., a Lipsey, M. W. (2001). Practical meta-analysis. Thousand Oaks: Sage publications.

Deputy Prime Minister's Office for Investments and Informatisation of the Slovak Republic
The methodology for evaluating synergic effects of the ESIF within context of the Europe 2020 Strategy
December 2016
Final Report, final version

Annex: Methodology Manual

1 Summary

The methodology manual is designed for mapping and evaluating impacts of the investment priorities and synergy effects, which are created during implementation of the smart, inclusive and sustainable growth priorities. The manual also is useful for evaluation of the specific operational programmes. It relates to mutual impacts of interventions and impacts by the external factors. The manual, except for evaluating synergic effects, can also be helpful for analysing impacts by the investment priorities.

The manual consists of three parts:

- The chapter 2 presents key quantitative and qualitative methods applied for evaluation of the Cohesion Policies. The chapter also state numerous examples for applications of these methods in evaluation of the results of the Cohesion Policy.
- The second part of the manual consists of chapters 3, 4 and 5. The chapters present potential approaches to mapping and evaluation of impacts by the investment priorities and synergy effects, which arise in implementation of the smart, inclusive and sustainable growth priorities.
- The third part of the manual presents summary tables (matrices of synergies). The matrices analyse allocations by the ESIF, RDP and OPF according to the intervention fields, investment priorities by the operational programmes, national targets of the Europe 2020 Strategy and the ESIF Thematic Objectives 1 – 11.

As for the use of the manual, the authors suggest to use process similar to process of the manual creation.

In the first step the matrices of financial allocations were drafted to evaluate impacts by the investment priorities. The matrices provide for the basic orientation in volume of the financial support and indicators of output and result. Each operational programme contains (within priority axes) description of the performance framework, result indicators on level of the specific target and output indicators on level of the investment priority and category of region. Intervention fields have codes according to the Commission Regulation no 215/2014 and account for specific financial allocations. The investment priorities in the operational programmes do not focus only on the national targets set by the Europe 2020 Strategy, but also on the ESIF 11 Thematic Objectives. Substantial part of the allocations (about 40% of the total contribution by the European Commission) are channelled to interventions outside the national targets. The expert team therefore created a special category 'allocations within the priority, but outside the national target'. Each allocation was related to a specific combination of output and result indicators. If only one result indicator was set in an investment priority, this indicator automatically was used for the matrix of output-result indicators. If two or more result indicators were set in an investment priority, indicator best fitting the character of intervention was used for the matrix. The same procedure was used for selection of the output indicators.

In the second step specific allocations were analysed according to their position within a national target and according creation of potential synergy effects. The chapters 3, 4 and 5 on smart, inclusive and sustainable growths state appropriate evaluation methods and

key data resources for evaluation of the ESIF contributions to national targets and synergies between the growth priorities. The chapters 3, 4 and 5 also identify areas of evaluation with lack of data (*Gap Analysis*) and suggest procedures for generation of data.

1.1 The structure of the Manual

The Methodology manual consists of the following parts:

Chapter 1' Summary' summarises main targets of the manual and procedures used for the manual creation.

Chapter 2 'Recourses, general approaches and targets of the manual' describes main challenges of evaluation of the Cohesion Policy and analyses main approaches and concepts of evaluation of the Cohesion Policy. The chapter also presents a concise overview of the key quantitative and qualitative methods applied for evaluation of the Cohesion Policy, and considers their strengths and weaknesses.

Chapters 3 'Smart Growth', 4 'Inclusive Growth' and 5 'Sustainable Growth' define the respective growth priorities and national targets related to these priorities. The chapters also suggest appropriate methodological approaches to evaluation of the national targets and synergies created between the growth priorities. The chapters 3, 4 and 5 also present main sources of data for evaluation of synergies and identify areas of evaluation, where lack of data present challenge for evaluation of the synergic effects by the ESIF. The chapters 3, 4 and 5 have uniform structure. They provide for detailed overview of the synergies, based on the allocation to particular intervention fields of the ESIF.

Chapter 6 presents Matrix of synergies between the thematic objectives and growth priorities.

Chapter 7 presents Matrices of synergies between the operational programmes and growth priorities. The matrices map the synergies according to the (1) codes of intervention fields, (2) financial allocations to intervention fields, and (3) output and result indicators of the synergies.

Chapter 8 contains list of abbreviations, boxes, tables and figures.

Chapter 9 contain list of experts involved in the evaluation.

Chapter 10 contains list of references.

2 Recourses, general approaches and targets of the manual

2.1 The challenge of evaluation of the Cohesion Policy

The Cohesion Policy is the most important investment policy of the EU. Its objective is to support the creation of work places, competitiveness of enterprises, economic growth, sustainable development and improvement of quality of life for the EU citizens. The policy creates investment framework and strategy for fulfilling set growth objectives that are defined by Europe 2020 strategy. It represents the key tool of the EU for dealing with social and regional disparities. Therefore it is very important to have a possibility of quantitative and qualitative evaluation of interventions impact and analyse benefits from achieved stated objectives.
Europe 2020 strategy defines current objectives of cohesion policy through three growth qualities[2]:

- ***Smart growth:*** developing an economy based on knowledge and innovation.
- ***Inclusive growth:*** fostering a high-employment economy delivering economic, social and territorial cohesion.
- ***Sustainable growth:*** promoting a more resource efficient, greener and more competitive economy.

Planned interventions in favour of intelligent, inclusive and sustainable growth (as they are defined by Europe 2020 strategy and more deeply Partnership Agreement 2014 – 2020) are complicated and mutually influencing area of soft and hard actions that include wide range of investment support into the infrastructure, business, professional training, innovation environment, technology transfer to social work in deprived communities. Methodology and practical approaches to the monitoring and evaluation of results need therefore comprehensive approaches and combination of various methodologies. In reality, we see, that only definition of three growth qualities is very complicated and individual interventions have comprehensive and sectional impact to many development aspects that are often hardly predictable. Concurrently, actions of cohesive policy are always implemented in specific social and economic context.
The manual is focused on synergic effects, but at the same time it helps analyse results of investment priorities. We see in practice that results from particular programmes are beyond results and indicators evaluated within the progress of priority axes and intervention impact is more comprehensive in reality.
The manual should be a help for users when dealing with two basic range of issues:

- How to seek for synergies and how to identify synergies between smart, inclusive and sustainable growth?
- How to map, quantify and evaluate synergic effects of interventions (positively or negatively) and how to analyse causal links?

[2] Europe 2020 – A European strategy for smart, sustainable and inclusive growth, Brussels 3.3.2010, KOM(2010) 2020 final version (pp. 5).

As it is stated in the Figure 1, we deal with the issue that only part of results and benefits from interventions are measurable, quantifiable and can be capitalize in reality. A large group of outputs and impacts (negative as well as positive) are possibly analysed only in the context of qualitative changes.
The manual therefore use logic of applied methodology of Social impact assessment (SIA). It is methodological approach that is built on the combination of processes of analysis, monitoring and systematic categorisation of intended and unintended results and impacts of planned policies, programmes, plans and projects. There are evaluating negative and also positive impacts and all social changes that were caused by these interventions. The main objective is to support economically beneficial, socially progressive and environmentally favourable solutions.

Box 1 What is evaluation?

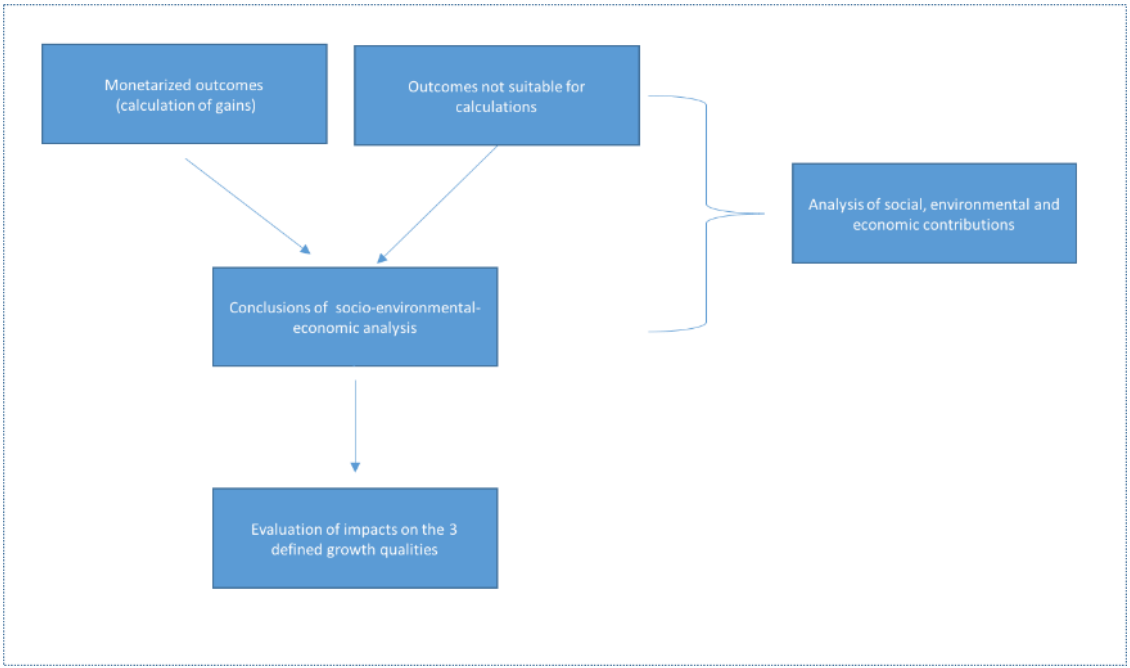
Evaluation is a systematic determination of achieved results' values and significance. It uses criteria that are managed by a set of standards. It regards a view on the activity or initiative with the aim to assess potential objectives, performed concept/proposal or other alternative and help in decision making; identify the level of success or value in connection with the intention and objectives and results of such action that was finished. Primary aim of evaluation is to understand functioning of previous or existing initiative and make it possible to move or help within the process of suitable change identification.

In the area of comprehensive evaluation, we talk about a change in result indicators that were because of policy and funding interventions as well as change in external factors. Basic equation:

Contribution of the intervention + contribution of external factors = change in result indicator.

Source: authors' review.

Figure 1: General approach to evaluation of synergic effects.

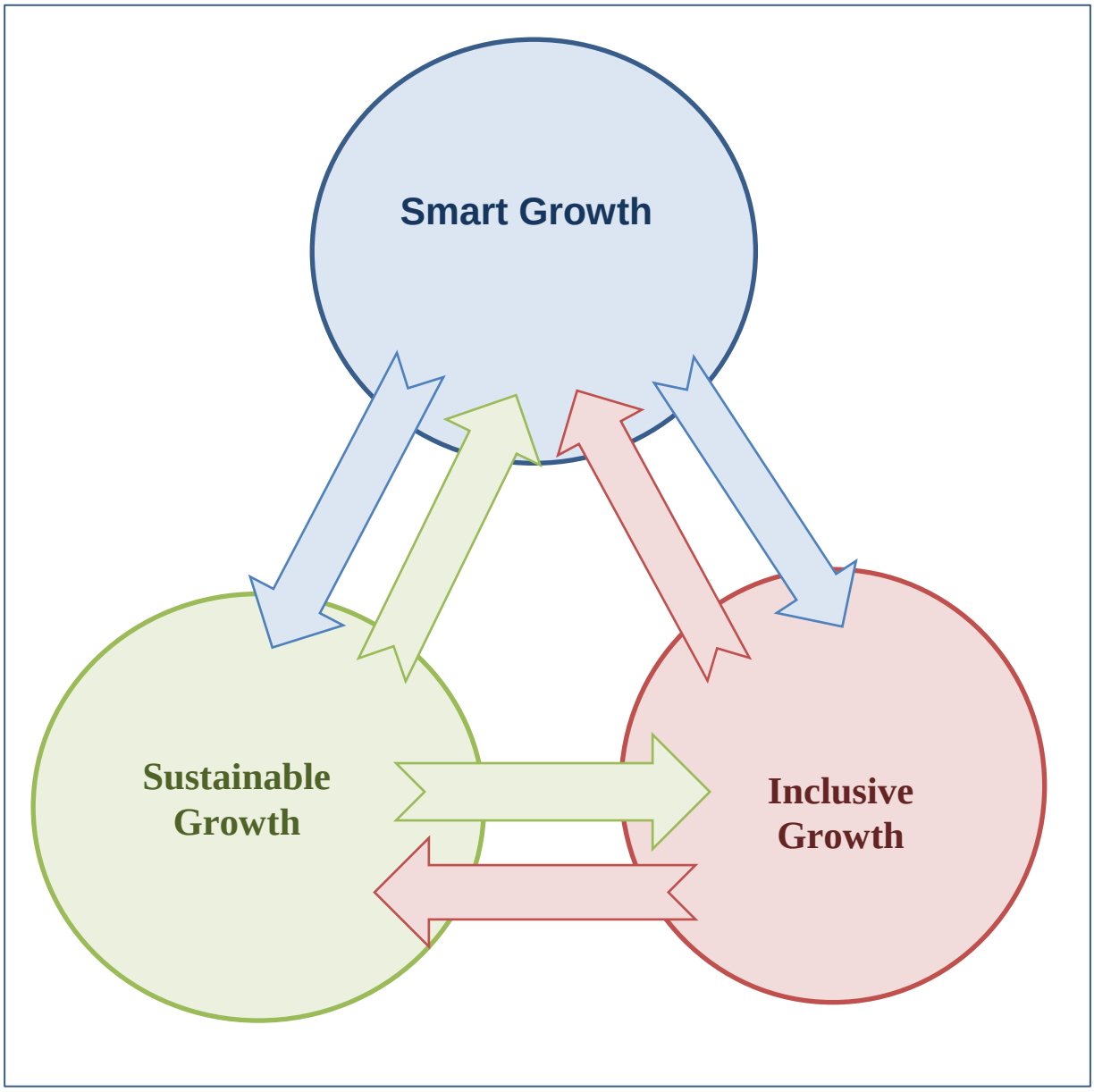


The aim of the manual is to map approaches to the evaluation of interventions and present specific framework focused on optimal combination of quantitative and qualitative approaches to the evaluation of synergic effects. It operates with three growth qualities defined by Europe 2020 strategy and approaches to the evaluation of overlaps between them. For example if we focus on smart growth objectives, we simultaneously support qualitative aspects of sustainable growth? If yes, how we can identify and map such overlaps?

This manual is not a detailed instruction manual to the methods of evaluation or the list of steps how to assess particular projects. The objective of it is to identify within the Partnership Agreement areas where various operational programmes are mutually overlapped and where emerge synergic effects between particular growth priorities.

The manual is based on allocations according to areas of interventions as they are determined on operational level (Figure 2). Team of evaluators analysed all allocations according to areas of interventions within the Partnership Agreement. Affiliation of an operational programme to the particular growth priority was set on the basis of the majority allocations to the priority. For example Operational Programme Research and Innovation concentrate the most allocations to the priority smart growth. Altogether, it consists of allocations that support sustainable and inclusive growth. The direction of synergy is always stated in this manual in line with the affiliation of particular operational programme to one of the growth priority.

Figure 2: The map of synergies between the growth priorities



2.2 General approaches and concepts of evaluation

Process and methods of results evaluation of cohesion policy are still evolving. Standard methods of socio-economic development evaluation with specific focus on cohesion policy evaluation are described in the document EVALSED from 2004. The document were prepared by the European Commission – Directorate-General for Regional Policy with the participation of experts from Maastricht University and Aston Business School.

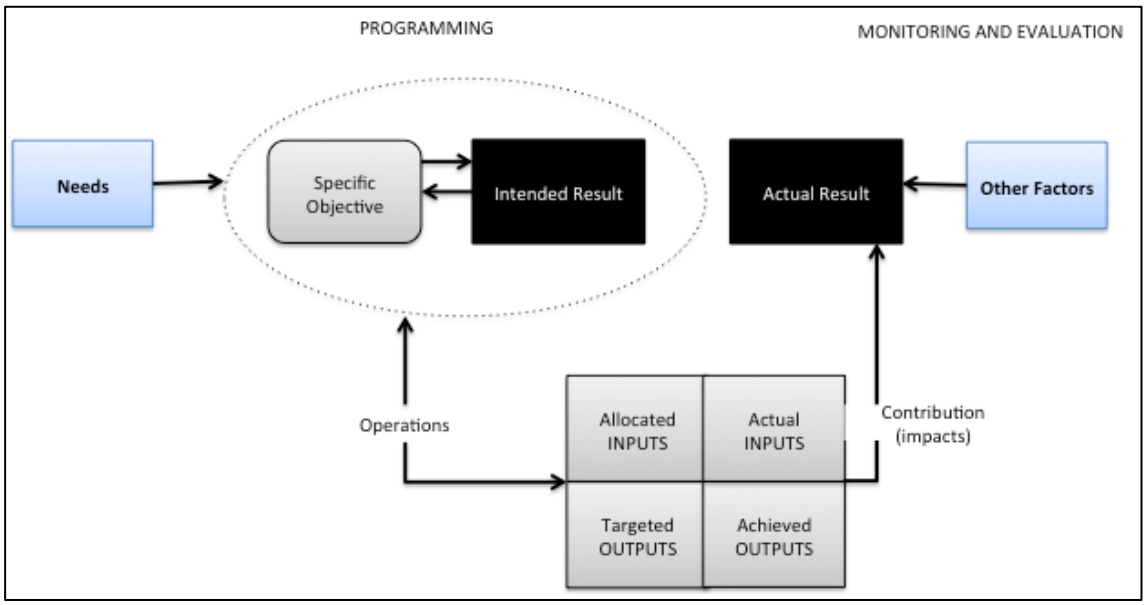
An important source of information for evaluation is also *Working Document No 5: Indicative Guidelines on Evaluation Methods: Evaluation during the Programming Period* from the European Commission for the programming period 2007 – 2013. Last update of the manual from September 2013 contents also regulations for evaluation in the programming period 2014 – 2020. The key source for the preparation of evaluation methods is manual and source information that are published and updated by the European Commission on the webpage and experiences gained in the impacts evaluation of coherence policy (EVALSED: *The resource for the evaluation of Socio-Economic Development - Evaluation guide*). The manual EVALSED recommends following types of evaluation methods:

- analysis of literature about the effects of socio-economic policy,
- user survey,
- econometric and/or statistical modelling,
- participative methods, including interviews and focus groups,
- case studies,
- indicators based on context data and/or administrative data provided by public institutions.

The material that directs approaches and frameworks for evaluations is in the document *Guidance document on monitoring and evaluation - European Regional Development Fund and Cohesion Fund*3. This manual is also based on the European Commission recommendations on evaluation in the programming period 2014 – 2020. As we can see in the Figure 3, the emphasis is on data triangulation and comprehensive evaluation methods. The objective is focus on the real results and analysis of external factors that affect and have impact on achieved results in this context (positive or negative).

[3] Programming period 2014 - 2020: Guidance document on monitoring and evaluation - European Regional Development Fund and Cohesion Fund–Concepts and Recommendations. European Commission, Directorate-General for Regional Policy: Brussels.

Figure 3: Outputs, results and impacts within the context of monitoring and evaluation



Source: Programming period 2014 - 2020: Guidance document on monitoring and evaluation - European Regional Development Fund and Cohesion Fund–Concepts and Recommendations

According to the experience from the evaluation of long-term effects of cohesion policy (1989 - 2013) that were gained by the team of researchers led by London School of Economics (LSE), results are necessarily dependant on whole list of external factors. It is needed to have a combination of methodological approaches and analysis of the situation from various perspectives to explore success rate of interventions in funds (for more information, see Bachtler et al. 2013). In other words, there is no ideal approach that would guarantee a result. All methods and approaches have their strengths and weaknesses. A good quality evaluation requires therefore: (1) adapt to specific research question, (2) everywhere where it is possible, analyse the situation from various perspectives and use various methods – triangulation principal, (3) costs of evaluation have to be adequate to expected results.

The first primary issue within the process of funds evaluation is the comprehensiveness of the situation. It is because of the large amount of external factors that influence achieved results. Next issue regards to the time horizon. Interventions in such comprehensive areas such as education, social inclusion or growth are seen with longer time lapse. The third primary issue is availability of data and definition of basic situation (so called Baseline). This is finding what was the situation before the interventions started to change it. It is beneficial to use to main principals that are mutually compatible and complementary within the evaluation of synergic effects of ESIF:

- *Theory-based impact approach:* Evaluation is based on the interventions logic and it is aimed at the mechanisms that led to observed changes while it should provide answers to questions why, how and what was the context in which interventions functioned.

- *Counterfactual impact approach:* Evaluation is based on control group and its main aim is to search for answers to the question how was the influence of interventions to the change. It simultaneously helps to compare effects of various actions through the analysis of their functioning in different conditions.

Theory-based evaluation of results provide important information that are not based only on quantifiable information, but include also deeper analysis of actions functioning, respectively not functioning and which of the factors and circumstances influence interventions results. Counterfactual evaluation of results can complements and extends situation analysis in the way when it provides more comprehensive information about the situation in supported and non-supported subjects, alternatively territorial areas. Although this method does not have universal application, in appropriate combination with the results evaluation based on the theoretical background it allows to provide complete and comprehensive evaluation.

The Box 2 states general definitions of indicators. The ESIF use output, result, programming, specific, and project indicators, and other indicators set by the Methodological Instruction No. 17 on the List of measureable indicators.

Box 2 Indicator types and use

Indicators are measurable variables that provides information about some specific aspects of researched process and/or results.

- Indicators of inputs: relate to sources that are necessary for the implementation of actions or interventions, for example: indicators referring to politics, human sources, material, financial sources.
- Indicators of processes: are based on indicators for measuring the situation whether activities were carried out, for example: indicators referring meetings, negotiations, trainings, distribution of material, research and testing.
- Indicators of outputs: provides details in connection with the product ('result") of activity, for example: indicators referring number and categories of health care providers trained within the project, number and type of prepared educational trainings.

Indicators of influence: for example referring to education of population, but also health conditions of marginalized groups. These indicators usually do not show quick and short-term results.

Politics focused on socio-economic issues usually combine various types of interventions within specific sector or territory. These interventions have roots in various areas of economic and social politics, such as research, development and innovation, education, professional training politics, etc. Specific interventions have own objectives, actions and indicators. The evaluation of objectives in strategic documents therefore meets with two types of issues:

- How to evaluate comprehensive list of mutually influencing interventions?

- How to assess not only the contribution of specific interventions, but also their synergic effects?

The evaluation of comprehensive socio-economic issues has to consequently take into account the current application of several evaluation methods. As we describe in the introduction, it refers to the search for optimal combination of quantitative and qualitative methods with the use of their strengths.

Quantitative methods allows objective measuring and statistical, mathematical or numerical analysis of allocated data[4]:

- They allow results aggregation on the level of actions and/or operational programmes.
- They allow to use methods of exploration analysis and predictive modelling (for example regression analysis, time series analysis) and also accept judgments about causal relations.
- They create basic overview on the issue and in this way inform follow-up qualitative analysis.
- They help identify size of the intervention effect and accept judgements about the adequacy of costs/benefits of interventions.
- They enable recognise important trends and monitor key indicators connected to socio-economic issues.
-

Quantitative methods allows detail analysis of socio-economic issues and effects of interventions:

- They help to identify causal context.
- They enable differ effects of interventions for specific groups of recipients.
- They enable detail analysis of specific processes that cannot be researched by quantitative methods.
- They help to clarify interventions context and differentiate intervention effect and effects of external factors.
- They use analytical methods of the type 'bottom-up" within the comprehensive phenomenon. There are often mixed activities and interests of stakeholders with intervention effects in such phenomenon.

Ideal evaluation should start with the analysis of possible approaches and selection of suitable combination of quantitative and qualitative methods that have greater potential to provide data and information needed for the subject of research and evaluation questions. At the same time chosen methodology has to serve for the situation analysis from various perspectives and allows triangulation of data. Conducted evaluation is not the objective, but only a tool.

[4] Deeper discussion to quantitative and qualitative methods is in: EVALSED Guide, Chapter 4: Choosing methods and techniques, pp. 73-90. European Commission (2014): Programming period 2014 - 2020: Guidance document on monitoring and evaluation - European Regional Development Fund and Cohesion Fund–Concepts and Recommendations. Brussels: Directorate General Regional and Urban Policy, March 2014.

The European Commission set the main priority for the programming period 2014 – 2020 – orientation to approaches that generate results. The evaluation logic is based in wider context on approaches from management that search for the continual improvement system (Figure 4). One of its presenters was W. Edwards Deming who defined its four phases. We start with planning, then it is implementation, evaluation and following return to the improvement of planning (PDCA – *plan-do-check-act* or *plan-do-check-adjust*).

Figure 4: Deming cycle

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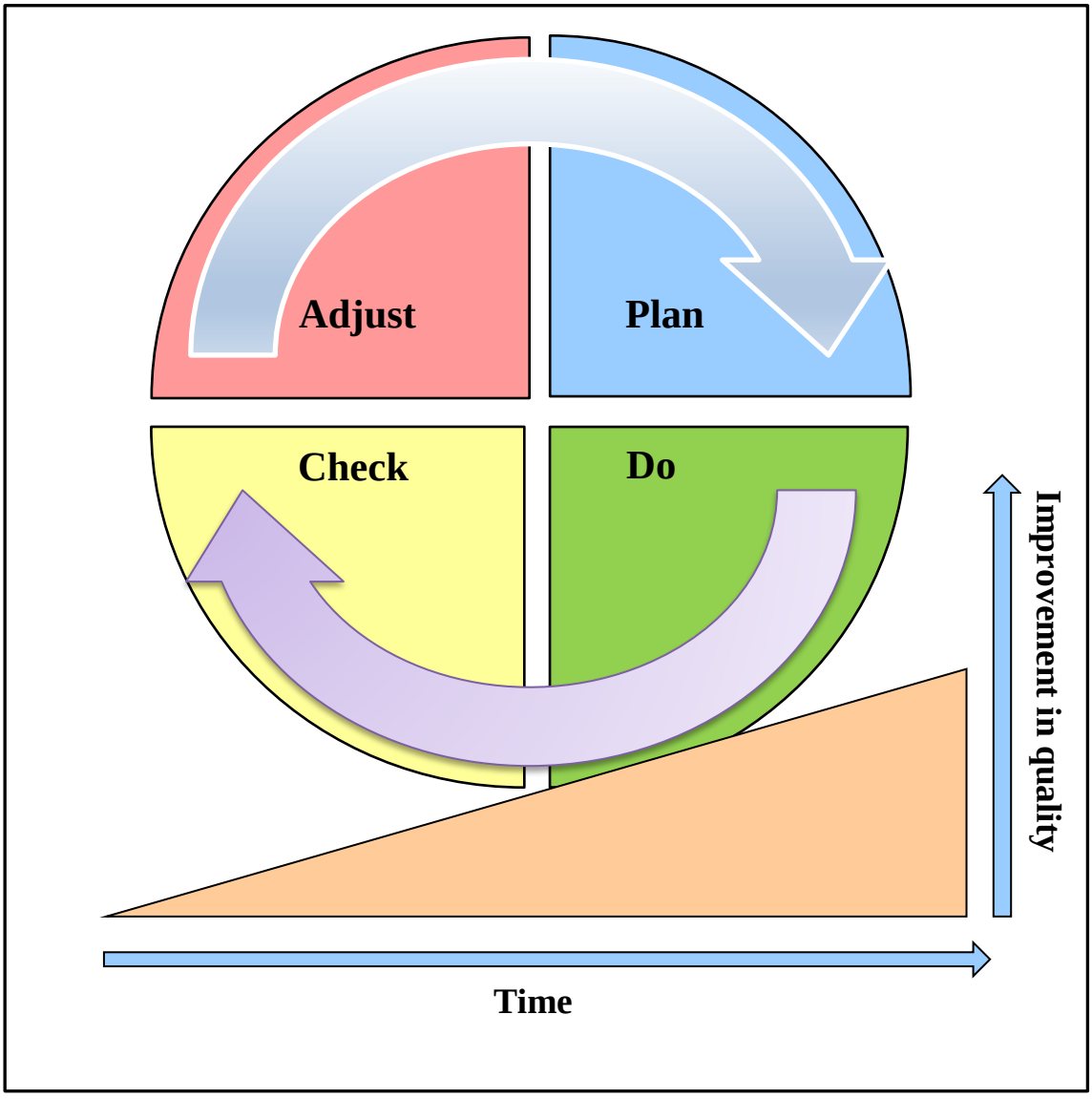


2.2.1 Quantitative methods

There is plethora of mathematical-statistical methods for the evaluation of interventions effects in public policy. Detail overview of econometric methods for results evaluation of social and economic politics present Imbens and Wooldridge (2009)[5].

Regression analysis
The most popular methods in analysis of socio-economic phenomenon is undoubtedly regression. Regression is statistical model that expresses direction and size of one or more independent variables influence (x_1, x_2, x_3....x_n) to a dependent variable (y). The example of using regression within ESIF intervention effects evaluation is the situation when we evaluate contribution of various independent variables (amount of investments from ESIF in one county, number of pupil to one teacher, share of population in material deprivation and divorce rate in county) to the change in dependent variable size (share of early school leavers). Regression make it possible to express if and how the ESIF support and other mentioned factors are important for the final result (number of early school leavers). Regression method has dozens of types and variants. Linear and logistic regression are mostly used.
Interesting possibility for the evaluation of synergies between growth priorities is testing interaction between two independent variables. Instead of the normal formula of regression with two independent variables:

$$y = a + bx_1 + cx_2, \text{ use formula } Y = a + bx_1 + cx_2 + d(x_1 + x_2)$$

The coefficient d express the importance and size of interaction between independent variables x_1 a x_2. If the coefficient d is statistically important at minimum level of 0,05, we can say with sufficient degree of certainty that synergy between two growth priorities exists. If the coefficient d is greater than zero, we can say that two growth priorities are mutually complementary and common effect of both growths is higher than simple sum of these effects. We can for example take one ESIF action that supports work places creation and the second that supports involvement of marginalized groups to work. As long as the unit costs of the second action are lower than the first and if the result of the second measure is to reduce the costs of care for socially disadvantaged citizens, we can talk about the positive synergy between job creation and social inclusion. If the coefficient d is lower than zero, we can say that common effect of two priorities is lower than their sum. The example of such situation is investment influence to smart growth for employment. New technologies increase work productivity and in many cases leads to the end of work places.

An issue in social and economic research can be high mutual correlation of independent variables (explanatory variables). For example it is typical for Slovak counties that there is high correlation between share of population with low education level, share of Roma ethnic group, share of population in material deprivation and share of unemployment. So highly correlated independent variables cannot enter to regression analysis independently because of the high level of unwanted multicollinearity. Standard solution

[5] Imbens. G.W and Wooldridge, J.M. (2009): Recent Developments in the Econometrics of Program Evaluation. *Journal of Economic Literature*, 47: 5-86.

is reduction of independent variables through factor analysis. Factor analysis enables get together several variables that are mutually highly correlated into small number of factors. Factors thus represents inputs for regression.
Specific limitation for regression method is that it enables specification of relation between dependent variable and a set of independent variables (and quantify size of individual independent variables influence on dependent variable), but on the other hand it do not enables specification of the direction for dependence. The example of such dilemma can be an issue whether people are poor because of their bad education or whether they do not have a good quality education due to their lack of financial sources. Both options are not mutually exclusive and dependence can be in both directions.
There can be used special type of regression during the evaluation of interventions impact in the process of identification of dependence direction, so called regression with instrumental variables. Instrumental variable is independent variable that do not influence dependent variable primarily, but only through own influence on other independent variable. It is not easy to find instrumental variables that help identify dependence direction. It is also not easy to guarantee that these instrumental variables will have sufficient explanatory power.
In the case when there are sufficiently long time series, it is possible to apply Granger causality in time series for identification of the dependence direction. Granger causality test examines whether the previous values of specific time series are valuable in forecasting the values of other time series.

Parametric and non-parametric tests
There exists a large amount of statistical tests that enable a sample characteristics evaluation. We are often concerned about whether supported sample of recipients has better characteristics than unsupported sample within the evaluation of interventions effects. Have for example supported enterprises through schemes aimed at research and development higher turnover, more patents and higher employment rate than unsupported enterprises? Is there increase in own expenditure in supported enterprises on research and development? We can ask in the area of sustainable growth if supported enterprises decreased energy consumption more than unsupported enterprises.
The most frequently asked question that is applied in statistical tests is test of average values. It can be for example comparison of average turnover or average energy consumption.
Statistical tests of indicators are divided into parametric and non-parametric tests. Parametric tests (for example t-test for average values comparison) are based on assumptions that researched sample has the normal distribution. It is not obligatory to meet the requirement of the normal distribution, especially with small samples and/or qualitative research. In such case it is necessary to use some of non-parametric tests (for example: chi-square test, Mann-Whitney test or Kruskal-Wallis test).

Production function
Production function is macroeconomic model that reflects a relationship between the amount of inputs to production and production output. The most famous example of production function is Cobb-Douglas production function. It is two factorial production function reflecting a relationship between inputs (factors of work and capital) and outputs (volume of product). Nowadays there is applied also knowledge as a factor in production function that enables specification of efficiency of work and capital factors combination

(Box 4). Factor of knowledge is connected with all types of new knowledge no matter whether they are in form of results from research, development, technological, marketing and/or organisational innovation.
In essence is production function the most suitable to measure the effects of smart growth. It is possible to use it also to measure synergies between smart and inclusive growth because of the factor of work force (including its quality).
Demographically older countries grew mostly thanks to the work productivity that is based on technological progress. The contribution of a new labour force to the economic growth is generally low and in some cases even negative (at an absolute decline in the working population). The same situation is also in the Slovak republic. There were two main sources of the economic growth in Slovakia and more important was the increase of work productivity that provided more than 90% of GDP in Slovakia in 1996-2012. Within the increase of total work productivity was the most important total factor productivity (TFP) that reflects combined contribution of technological progress, education of workforce and methods of effective work organisation. Total factor productivity ensure around the half of the work productivity increase.
Production function provides mostly context information within the evaluation of synergies between growth priorities. It enables the comparison of structure in the context of economic growth sources between various countries and mainly the role of education and knowledge creation within this growth. Production function can be also possible to disaggregated in some cases for economic sectors and specified the contribution of work, capital, education and knowledge for their development.

Data envelopment analysis (DEA)
Data envelopment analysis, sometimes called also stochastic frontier functions method, is an analytical method measuring the efficiency of various social and economic processes. It is a multi-criterial method that measures relative efficiency of processes according to several criteria from inputs to outputs (Talluri, 2000). It became very famous in social and economic output in relatively short time since its presentation in 1978 (Charnes et al., 1978). It does not require the formalisation of evaluated process in specific formula of some production function neither set priory parametric assumptions about researched values, for example the normal distribution of measured values and therefore it can shows dependences that are not detectable by other methods (for example linear regression). Great advantage of DEA is that it enables taking into account various factors influencing the efficiency of social and economic processes. We can express these factors practically in various units. Efficiency is specified for decision-making units (DMU), for example schools, hospitals, banks, but also individuals or countries (Cooper et al., 2010). It is necessary to do following steps for the evaluation of whatever number of DMU:

- specify inputs and outputs for each DMU,
- define the efficiency rate for each DMU as weighted sum of outputs (total outputs) divided by total sum of inputs (total inputs) while all efficiency rates lies between values 0 – 1 (thus between 0% and 100%),
- specify weights in the way to maximise efficiency during the calculation of numerical efficiency value of each DMU and the DMU was presented as good as possible.

Efficiency evaluation is often done by evaluative criteria that compare inputs and outputs of processes. We mention simple example for deeper understanding. There is the comparison of countries according to the height of economic growth (thanks to green technology investments) to 1 Euro of GDP in Box 3. Country A is the most successful in emissions reduction (6,5% in reference period), but its economic growth is only 1,5% yearly. Country C reports the highest economic growth (3,5% yearly), but reduced emissions only by 4%. Country B reduced emissions by 5% and gained economic growth 2,5%. These countries are on the frontier of efficiency due to their ability to generate the best ratio of both outputs (economic growth based on technologies) and outputs (emissions reduction).

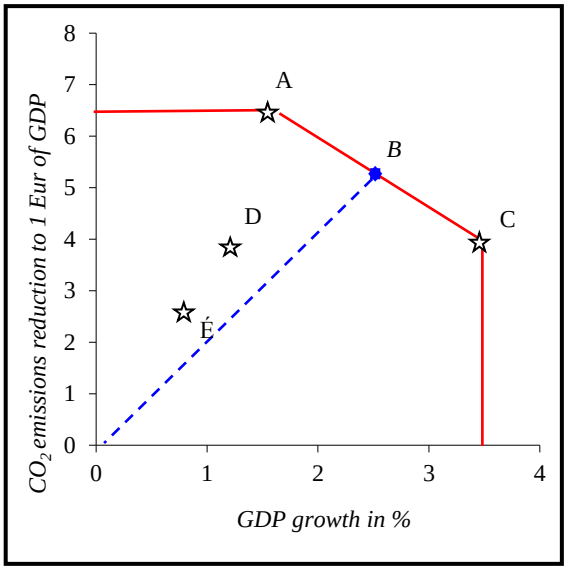
DEA method enable quantification of the current position of each DMU according to set criteria in advance. It is possible calculate with various scenario of the evolution based on the current position. For example country A can choose if it is still the most effective in emissions reduction, but its economy will grew slowly than the economy of country B. Country A can choose also compromise: slows emissions reduction and increase growth rate while it still stay on the frontier. Great advantage of DEA method is that results can serve as an impulse for change of objectives, respectively limiting conditions of optimisation. Countries D and E have lower growth and lower emission reduction rate and thus they are under the frontier of efficiency. If they want to get on the frontier, they have to significantly increase their economic growth or emissions reduction rate or both.

DEA method gained popularity in economic and social practice mainly thanks to its non-parametrical character that is not based on strong assumptions about linear structure of background data dependences. Further advantage of this method is a great flexibility in including highly diverse indicators into the model. Examples of DEA in practice include the evaluation of hospitals (Navar and Ozcan, 2008), measurement of efficiency in police work (Sun, 2002) or evaluation of computer printers quality (Doyle and Green, 2003). Wide bibliographic analysis about DEA method application during 30 years from its creation (Emrouznejada et al., 2008) identified the evaluation of productivity, operational research and management as main sectors of DEA method application. DEA was in economic sectors and social activities mainly used in banking, health care, education and human resource management.

DEA method is based on relative efficiency. We cannot say that country A, B, C gained the greatest possible combinations of both outputs and their performance could not be improved. We can say that these countries are relatively the best from researched countries. It is based on two set criteria.

Comparisons between DEA method and classic regression analysis show that DEA provides more accurate results. However these results are less stable than from regression analysis (Thanassoulis, 1993). Disadvantage of the method is also increase of effective decision-making units simultaneously with increasing number of input and output variables.

Box 3 Formal presentation of the DEA



So called extended Pareto-Koopmans definition of efficiency says that the performance of a DMU is efficient if and only if it is not possible to improve any input or output without worsening any other input or output. We do not know specify the level of absolute efficiency within describing social and economic phenomenon in real life. Therefore we will limit ourselves to the definition of efficiency which we determine based on any gathered empirical information. So called relative efficiency says that specific DMU is based on available proof fully efficient if and only if the performance of other DMU do not reflect that some of their inputs or outputs could not be improved without worsening some of their other inputs or outputs.

Suppose we evaluate the efficiency of n DMU. Each of DMU consumes various amount of inputs and products various amount of outputs. Relative efficiency of each DMU is determined by weighted sum of outputs divided by weighted sum of inputs. If we mark amounts of inputs as m and amounts of outputs as s, than relative efficiency of specific DMU marked as p can be set based on the model

$\max \sum_{k=1}^{s} v_k y_{kp} / \sum_{j=1}^{m} u_j k_{jp}$ with limiting conditions $\sum_{k=1}^{s} v_k y_{kp} / \sum_{j=1}^{m} u_j k_{jp} \leq 1$ for all i, and vk, uj ≥ 1 for all k, j. It is that yki = amount of input k to produced DMU I; xji = amount of input j consumed by DMU i; vk = weight set to output k; and uj = weight set to input j. Share of weighted inputs and outputs can be rewritten into the liner program

$\max \sum_{k=1}^{s} v_k y_{kp}$ with limiting conditions $\sum_{j=1}^{m} u_j k_{jp} = 1$ a $\sum_{k=1}^{s} v_k y_{ki} - \sum_{j=1}^{m} u_j ki \leq 0$ for all i, while it is that vk, uj ≥ 0 for all k, j.

Source: Authors according to Talluri, S. (2000) and Cooper, W.W., Seiford, L.M. and Zhu, J. (2010).

Box 4 Production function

The current opinions about the sources of economic growth are based on the works of Solow, Romer and Barr. It can be summarised as follows: Production process has three common inputs – work, capital and technology, respectively knowledge. This relationship enters to known function of production function: Y = F (K, L, A), where Y is production, K is capital, L is work a A are technologies, respectively knowledge in wider consideration. There results from production function that whole production (for example GDP growth) can rise in various ways: (i) increase in number of workers and/or number of working hours, (ii) improve the quality of employees structure, for example by increase in their education level, (iii) increase in amount of capital to one worker (fixed investments rise more quickly than number of workers and occurs so called capital deepening), (iv) increase the level of used technology and/or improve the quality or work organisation. Inputs of these factor to production are defined mainly in Cobb-Douglas function:

$$Y = AK^{\alpha}L^{1-\alpha},$$

where α is a part of national product in relation to capital and 1-α is a part related to the compensation of workers. Education simultaneously with a number of workers are important. Therefore workforce input '*L*' is written as L_Q and represents the amount of workforce (a number of workers, respectively working hours) and also its quality (mainly specified by the level of education). The rise in national economics is calculated on one worker and/or one working hour due to better comparison. When we divide previous formula by number of workers, respectively number of working hours in national economy we get GDP *(y)* created by one worker, respectively attributable to one hour:

$$y = Y/L = (AK^{\alpha}L^{1-\alpha}) / L = AK^{\alpha}.$$

Data about workforce and capital are gathered from national macroeconomic statistics. Indicator A evaluates inputs of knowledge expressed in the form of combined effects of work and capital (total factor productivity – TFP). Indicator *A* (TFP) is calculated from Cobb-Douglas function as a residual, when we deduct work and capital contribution from total growth. Indicator TFP express in this way the influence of technologies and progress in work organisation to the economic growth.

Calculations of growth accounting have also numerous limitations. The most important is the assumption that shares of work and capital to GDP are constant. It does not reflects realty every time. An amount of work spent in national economy is rightly measured by an amount of working hours. These data are not available every time. It is also hard to incorporate shadow economy. The level of education is also measurable in many ways, for example through public expenditure to education or share of workers with the second or higher level of education in comparison with total workforce.

Macroeconomic models

Macroeconomic models enable measuring the effects of interventions to national or regional economy. Two mostly used types of models are CGE and HERMIN.

Model HERMIN is based on multi-sectoral model HERMES that was created on the initiative of European Commission in 80s. The model was used for the evaluation of cohesion policy effects in several member states of EU as well as regional policies effects (Bradley et al 2005). There are evaluated indicators as GDP, total employment, productivity of work and unemployment. The model compare the development of these basic macroeconomic indicators within the use of structural funds and also without using them. HERMIN types of models enable not only the evaluation of economic development

ex post, but also to suggest optimised scenario for financial allocations and suggest changes in allocations. Model HERMIN was also successfully used for the evaluation of cohesion policy effects in the Slovak Republic.

Advance preparation of data for the comparison of control and tested sample

The effect of interventions is often evaluated by counterfactual analyses. There are compared two groups: a group of recipients of intervention (tested sample) and a group without intervention (control sample). Such groups can be for example agricultural enterprises that get support from European sources and enterprises that did not get it. Other example can be students that benefited from ERASMUS programme and other university students. If we would like to identify the effect of intervention, we have to ensure comparability of both groups at first. It is for example possible that enterprises gained more benefits from European support of specific size and/or students in specific fields of study. Standard procedure to ensure comparability of tested and control sample is advance preparation of data through *Propensity Score Matching* (PSM) method. Statistical method PSM tries to quantify effects of an action (policy, intervention) by taking into account the importance of independent variables that make participation in the action. In other words, PSM method tries to assign to each member in the test sample a 'mirror" member in the control sample that has very similar characteristics. PSM methods reduce distortion of observation that cause confounding variables This distortion can occurs if we compare results in test and control group without additional statistical processing.

PSM method has following steps: (1) Specification of independent variables that influence if the enterprise will be in tested or control sample. (2) Calculation of PSM score through logistic regression, while participation in tested sample has value 1 and participation in control sample value 0. (3) Comparison procedure (for example by methods of closest neighbours) between members of tested and control sample. (4) Statistical comparison of independent variables in tested and control sample after pairing samples (for example comparison of standardised differences of averages). (5) Estimation of intervention effect in paired sample. There is often applied t-test or ANOVA[6].

Advance preparation method can be applied for the evaluation of the main effects of public interventions (for example ESIF influence to the decrease of early school leaving) as well as for the evaluation of synergic effects of such interventions (for example ESIF interventions influence to the decrease of social exclusion and early school leaving).

1.2.2 Qualitative research

The qualitative research for evaluation purposes should be focused on research of the natural environment, highlighting the importance of understanding the processes that affect the considerations discussed and it should include elements of inductive analysis and grounded theory (Atkinson et al 1988). The dominant methods of qualitative research are usually participatory and non-participatory observation, questionnaire

[6] For more information: Thoemmes, F. (2012): Propensity score matching in SPSS, arXiv preprint arXiv:1201.6385, 2012.

surveys, semi-structured interviews and study of written material gathered from secondary sources or directly during field work.

The qualitative methods (Box 5) allow insight into the system in three main ways:

- Relevance of existing interventions;
- Achieved results;
- The impact of interventions.

Box 5 What is qualitative research?

Qualitative research is primarily exploratory research for the unknown and undescribed areas. It is used to obtain information and data relevant for understanding the underlying reasons, views and motivations. It aims to look into the issue and / or acquire and develop ideas or hypotheses for subsequent quantitative research.

Qualitative research is also used to detect tendencies in thinking and opinions of social actors and to get a deeper understanding of the factors that create or affect the studied problem. Qualitative data collection methods vary from using of unstructured to semi-structured techniques. Some common methods include focus groups, individual interviews and participation / observation. The sample size is usually small, and respondents are selected to meet required quota.

While quantitative methods provide empirical data and results, they do not have sometimes clear answer to question why and how were achieved intended and unintended effects of interventions. Qualitative methods have the main benefit in searching an answer about ways of interventions functioning. They provide data for searching the solutions since knowledge and information are mostly in the system, but sometimes it is not possible to identify them due to various barriers.
Quantitative and qualitative research methods differs mostly in five aspects:

- analytical objectives,
- types of questions that use,
- types of gathering data and tools that use,
- types of data that produce,
- the level of flexibility that can be incorporated into the design of study or research.

Table 1 provides the comparison of qualitative and quantitative research approaches and identify benefits and limitations that can occur in used approaches.

Table 1: Comparison of quantitative and qualitative research approaches

	Quantitative	**Qualitative**
General Framework	Seek to confirm hypotheses about phenomena Instruments use more rigid style of eliciting and categorizing responses to questions Use highly structured methods such as questionnaires, surveys, and structured observation	Seek to explore phenomena Instruments use more flexible, iterative style of eliciting and categorizing responses to questions Use semi-structured methods such as in-depth interviews, focus groups, and participant observation
Analytical Objectives	To quantify variation To predict causal relationships To describe characteristics of a population	To describe variation To describe and explain relationships To describe individual experiences To describe group norms
Question Format	Closed-ended	Open-ended
Data Formal	Numerical (obtained by assigning numerical values to responses)	Textual (obtained from audiotapes, videotapes, and field notes)
Flexibility in Study Design	Study design is stable from beginning to end Participant responses do not influence or determine how and which questions researchers ask next Study design is subject to statistical assumptions and conditions	Some aspects of the study are flexible (for example, the addition, exclusion, or wording of particular interview questions) Participant responses affect how and which questions researchers ask next Study design is iterative, that is, data collection and research questions are adjusted according to what is learned

Source: Adapted from Qualitative Research Methods: A Data Collector's Field Guide, FHI 2000.

Suitable methods of qualitative research

In the course of the review and assessment of achieved results and positive / negative outcomes of interventions, it seems as the optimal approach to combine following three proven qualitative methods. It is a participant observation, in-depth interviews and focus groups. Each method is suitable for obtaining certain specific data type:

- **Participant observation:** Is suitable especially for understanding of naturally occurring behaviour in a normal contexts. Suitable especially for the evaluation of the so-called 'soft projects" in the field of social inclusion and education. Observation of social practice in a particular project site provides valuable information, such as how implementation works, how and whether the main actors do have the support of the target group, or how well implemented programs function and what are the intended and unintended results.
- **In-Depth interviews:** Are optimal for data collection on the history and process of implementation of measures, and to identify barriers that hinder the process. They are particularly suitable in an environment where we investigate sensitive topics such as personal responsibility, external influences and the like.
- **Focus groups:** They are effective in collecting data on the internal functioning of a complex system such as the implementation of projects. They are very effective in identifying problems and developing solutions and recommendations.

Possibilities in the assessments and advantages of qualitative methods.
Evaluation during the last and present programming period indicate significant advantages of using qualitative methods. The area of programming and implementation of cohesion policy is a very complex and sensitive. It is therefore quite difficult to identify and interpret the deeper structural and other barriers in achieving stated objectives. Personalized and anonymized approach in qualitative research thus has potential to reveal broader causal connections and implications for management.
An important aspect of the research is triangulation of the data obtained. It is optimal to use of techniques that allows the data validation by means of cross-verification of two or more sources. In particular, the use of a combination of several research methods in the study the same phenomenon is useful.
For instance, appropriate selection of the sample of respondents for interviews and focus groups may allow views that confront and eliminate extreme deviations. This is a sensitive area, because it is sometimes very difficult to filter, what is extreme evaluation of the respondent and vice versa, what is original and beneficial perspective. Therefore, the proper combination of methods for the qualitative research depends also on experience of the research team and on systematic approach to the analysis of data, using the triangulation.
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2.3 Strengths and weaknesses of particular approaches, potential risks and solutions

The conducted pilot evaluations of strategy Europe 2020 targets tested different approaches to the evaluation of achieved impacts of the interventions in so diverse areas such as research and development, education, sustainable growth and employment. The pilot evaluations indicate, that the most appropriate approach to evaluating the impacts is a combination of quantitative and qualitative methods. It allows to triangulate different data and to combine research methods according to the analysed topics. A combination

of various quantitative and qualitative methods is also recommended by EVALSED manual.

Based on the pilot evaluations outcomes we summarize here the main methodological recommendations for the upcoming assessments:

- **Aims and objectives of the evaluation:** The key is clearly and precisely defined objective of the evaluation, which should not be too broad, but focused on the key issues. Following this step, it is important to define precisely which interventions will be analysed, and what are the synergies that the evaluation focus.
- **Evaluation questions and criteria:** The appropriate and clear evaluation questions should ideally be directed to areas where information is lacking and should have clearly defined added value of research. Evaluation criteria were tested in the pilot evaluations, where they focused on the relevance, efficiency and effectiveness of the interventions. This framework appears to be suitable also for follow up evaluations.
- **Planning evaluation:** When combining quantitative and qualitative approaches, it is important to determine which method is most appropriate to the evaluation questions, how data and information complement each other, and what are triangulation options. For instance in the pilot evaluation in education, research and development and green growth, results of the questionnaire surveys proved to be consistent with data from field research and provided additional information for better understanding of the context and internal / external factors affecting results achieved.

From the pilot evaluations, following conclusions may be drawn on the strengths and weaknesses of tested approaches:

Strengths:

- Slovakia has a unified monitoring system ITMS common for the entire EŠIF;
- There is increasing number of external sources of information and analysis, which may be used for the evaluation of R&D in the Slovak Republic (i.e., database of financial indicators, quality rating of research organizations). In combination with statistical data and qualitative approaches it enables a large variety of approaches to the evaluation of measuring results of interventions;
- There is a large number of evaluation studies on what are the effects of public policies on smart, sustainable and inclusive growth in the OECD countries. It enables international exchange of knowledge and experience. Particularly interesting is the exchange of experiences with the Czech Republic, where in many respects we see similar socio-economic environment as the one in Slovakia.

Weaknesses:

- Most of the assessments are conducted by government bodies, that are logically focused on its own operating program. Experience with the assessment of synergy effects of different operational programs is limited;
- The analysis of individual national targets of the Europe 2020 does not provide a sufficiently comprehensive picture of the synergy effects of interventions. The national targets are often interdependent. Therefore, analysis of the national goals represent only a partial picture of the results and effectiveness of interventions;
- Possibilities to use ITMS output indicators for evaluation of Europe 2020 goals are rather limited for R&D. What is missing are some key indicators (especially of the volume and the internal structure of expenditure on R&D in businesses, testing of students in schools supported by EŠIF). It is also necessary to analyse the results and impacts in the context of socio-economic indicators. It is however, prevailingly difficult to separate the positive / negative impact from external factors influencing results achieved and impacting effects of the interventions.

Threats:

- Evaluation of the synergy effects of interventions that go beyond an individual OP face the fundamental problem, which interventions should be taken into account and which should be omitted. Each growth priority contains many direct and indirect effects of different interventions and we face risk to left out an important area of impacts. The methods applied to EŠIF synergies and to assessment of the Europe 2020 goals must therefore always adapt to research problems.

Opportunities:

- A combination of quantitative and qualitative methods, which allows for different triangulation of data and combine research methods according to the analysed topics.
- The methods providing a comprehensive view on the cumulative impacts.
- The information and data can be used for further evaluation.

3 Smart growth

This chapter firstly defines 'smart growth' in chapter 3.1 and then turns national targets in the smart growth in chapter 3.2.

The chapter 3.3 presents the quantitative and qualitative methodology approaches to evaluation of the ESIF contribution to the smart growth. The achievement of the national targets of the EU2020 Strategy is subject to social, economic and demographic context. The chapter 3.3 analyses impact of the context on the choice of the evaluation methods. The chapter also presents examples of applications of the methods in the past evaluations. The main investment priorities for achieving national targets are listed in the final part of the chapter. The chapter presents investment allocations and key activities of the investment priorities, and combination of the output and result indicators for evaluating contribution of the ESIF to achievement of the national targets.

The chapter 3.4 summarises key data sources, which are needed for evaluating contribution of the ESIF to achievement of the national targets and for evaluating synergies between the growth priorities. The chapter also identifies fields of evaluation with lack of data (Gap Analysis) and suggests procedures for the data generation.

The chapter 3.5 firstly analyses allocations by the operational programmes to the smart growth priority. It also lists allocations, which fell under the priority, but are outside the specific national targets. The chapter also lists a table with a map of allocation by the OPRI, OPEPA and OPF to targets in the smart growth. The table lists fields of interventions and amounts of allocations for each investment priority by the abovementioned operational programmes. The subchapters 3.5.1 and 3.5.2 map synergies between the smart growth on one hand, and inclusive and sustainable growths on the other hand. These subchapters also include tables with maps of allocations for specific priorities by the OPRI, OPEPA and OPF.

3.1 Definition of the Smart Growth

The Smart Growth means developing an economy based on knowledge and innovation. The EU2020 Strategy defines Smart Growth in following way[7]:

'Smart growth means strengthening knowledge and innovation as drivers of our future growth. This requires improving the quality of our education, strengthening our research performance, promoting innovation and knowledge transfer throughout the Union, making full use of information and communication technologies and ensuring that innovative ideas can be turned into new products and services that create growth, quality jobs and help address European and global societal challenges. But, to succeed, this must be combined with entrepreneurship, finance, and a focus on user needs and market opportunities'.

[7] Communication from the Commission, Europe2020 (2010): A strategy for smart, sustainable and inclusive growth, European Commission, Brussels, 3.3.2010 COM(2010) final, pp. 11-12.

3.2 The national targets for the Smart Growth

The Slovak national targets in Smart Growth refer to:

1) less than 6% of children should leave school at an early age by 2020
2) at least 40% of 30-34–year-olds should complete third level education by 2020
3) 1.2 % of GDP to be invested in R&D, of which 2/3 by the private sector by 2020.

3.3 The methodological approaches (quantitative and qualitative) for evaluating contributions to the Smart Growth

3.3.1 Target 'decreasing rate of early school leavers under 6% by 2020'

The socio-economic context of evaluation

A review of the relevant literature should be first step in the analysis of the 'early school leavers. The PISA exercise by the OECD is a good resource of the internationally comparable information[8]. The studies on education suggest that a large complex of factors impacts outcome by students of the primary, secondary and tertiary students. Many factors relate to the socio-economic background of region and society the students live. Most important factors include education of parents and other relatives of the students, employment rates, income levels in the region and/or presence of the marginalised communities in the region. The students from divorced and/or incomplete family, and those coming from small villages also use to account for sub-standard education outcomes. The type of school (vocational training school versus general secondary school) also may be of importance for the education outcomes. The general secondary schools usually are located in the cities and visited by higher numbers of talented students. The quality of education also is impacted by personal capacities of the education system (e.g. number of students per one teacher) and amount of financial means allocated to development of the school (see Box 6 for an example from Slovakia).

The abovementioned contextual factors are crucial for achieving good outcomes of the education. Any evaluation of the contribution by the ESIF to achieving national target has to take these factors into account. High complexity of the issue indicates a combination of the quantitative and qualitative methods has to be applied in evaluation of the national target.

Methodology of the national target evaluation

[8] OECD (2014): PISA 2012 Results in Focus What 15-year-olds know and what they can do with what they know. OECD: Paris.

The importance of the socio-economic context of the implementation of the ESIF and the diverse character of the interventions indicates a combination of the quantitative and qualitative methods has to be applied in evaluation of the national target.

The quantitative analysis may exploit (a) a regional approach, which is based on existing statistical data, or (b) a national-wide approach, which is based on the student survey.

The regional approach quantifies the ESIF contribution with help of the secondary statistical data. The approach is based on comparison of the inputs to education in the Slovak (NUTS IV) regions (districts) and outputs of education (rates of the early school leavers). The number of the Slovak districts (79) is high enough for conducting regression analysis. The regression quantifies relation between the education inputs and outputs in terms of (i) statistical significance and (ii) strength of relationship.

It is a frequent event in the socio-economic research that the independent (explanatory) variables are mutually correlated. If a district accounts for the high unemployment rate, it also is likely to account for low average wage, high incidence of poverty and high share of marginalised social groups in the total population. It is incorrect to use the highly-correlated independent variables in the regression. The solution is the subject the independent variables to factor analysis. The factors generated via the factor analysis further are used as inputs in the regression equation.

Rich data sources, data availability and low costs of data are main advantages of the regional approach. In fact, all data needed for the analysis are available from the public databases and provided by the Statistical Office of the Slovak Republic (SOSR), Slovak Centre for the Scientific and Technical Education (SCSTI), the Central Office for the Labour, Social Affairs, and Family, and the Ministry of Education, Science, Research and Sports (MESRS). Data on the ESIF investments are available from the ITMS+ database. These data can be aggregated on the district level. The data on inputs and outputs of the education are available for high numbers of years and allow for the time series analysis.

The regional approach also has some weaknesses. All Slovak districts benefit from the ESIF interventions. The counterfactual analysis therefore cannot be used on the district level. A hypothetic comparison of districts benefiting / not benefiting from the ESIF interventions is difficult, as there are almost no districts with zero intervention. The regression analysis can indicate, whether the ESIF intervention is significant in the regression model and suggest the strength of the relationship. The regression analysis, however, cannot prove arrow of causality. The regression analysis, for example, indicates there is a strong indirect relation between the amount of the ESIF intervention and rates of the early school leavers. The standard interpretation is that the higher amount of intervention was channelled to a specific district, the more the rates of early school leavers decreased. The alternative interpretation is that there is a relation between the quality of ESIF project applications and amount of the ESIF intervention. It is possible that the developed districts (with low rates of the early school leavers) accounted for high-quality teachers/mayors and were able to submit the higher quality project applications than teachers/mayors from the less developed districts. These two interpretations are not mutually exclusive and, in fact, complement each other. The

results of the quantitative analyses must therefore be interpreted within a specific context. The context is best explained by the qualitative analytical methods (focus groups, in-depth interviews).

The approach based on the students' competences, for example is used by the OECD PISA exercise. It is an international comparison, which records both educational outcomes and the socio-economic background of the students. The PISA exercise enables for monitoring impact of the students' social background on the education outcomes and motivations of the students to achieve better outcomes. It also enables for analysing relationship between the education outcomes and diverse features of the schools and education systems. Main advantages of the PISA exercise include: (i) targeting particular students and schools (the regional approach aggregates data on the district level) and (ii) international comparability of the data. There are some reservations about the PISA exercise too and relate to the contents and methods of the testing, or student sample selection. Many indicators in evaluation are based on the indices created from opinions by the schoolmasters, teachers and students. Some indicators may not reflect the reality correctly[9]..

The ESIF beneficiary survey (sent to school directors / mayors) is another evaluation method for the national target. The survey enables for representative opinions of the project beneficiaries. The survey may combine open and closed questions. The closed questions may be coded on the Liker scale from 1 to 5, or 1 to 10. If the response rate is high, the answers can be evaluated via the non-parametric tests. The analysis, for example, may explore whether specific types of respondents differed in their opinions (e.g. school directors versus mayors).

The qualitative analyses, based on the focus groups and in-depth interviews enable clarifying some important details and causal relations, which are impossible to pinpoint by the quantitative methods. The quantitative field research does not enable for creating representative sample of projects and localities. The representative sample also is no target by the qualitative research. The researchers, however, have to select projects and project localities in such way as to enable for comparing experiences from diverse types of activities – according to the target, mode of implementation and type of school.

The interview usually is implemented in the semi-structured way. The respondents have to have opportunity to state their own opinions. The list of prepared questions assures all issues are debated during the interviews. The participant observation is an important part of the research. The participant observation assures the researchers obtain a good overview of the situation of the school and the implemented project. After the end the interview, the researchers also should be accompanied by the school director or teacher and visit the school and classes benefiting from the ESIF support. There also in an opportunity to have a small talk with teachers, students and parents accompanying students.

[9] Šiškovič, M. a Toman, J. (2014): PISA 2012: výsledky Slovenska v kocke, Komentár 01/2014, Inštitút vzdelávacej politiky Ministerstvo školstva, vedy, výskumu a športu SR {*Slovakia's outcomes in a nutshell*}. The commentary 01/2014, The Institute for the Education Policy of the MESRS.

The information obtained from the school management are compared with information from participant observation, and/or information from the school webpage and project fiche.

The results of the quantitative methods are sensitive to a careful preparation. Localities and respondents typical for the project implementation must be selected. Selection of projects and respondents also must reflect diverse forms of the project management. It enables for identifying impact of project management on the project results.

Box 6 Evaluating synergies between the inclusive growth targets in the Slovak regions

The pilot evaluation of the education target identified 1,082 projects from the Operational Programme Education (OPE) and the Regional Operational Programme (ROP). The projects targeted kindergartens, and primary and secondary schools in 79 Slovak districts. There were some 388 projects under the OPE Measures 1.1, 4.1 and 3.1, and 663 projects under the ROP Measure 1.1 with certified spending rate at least 70%. Some schools benefited from two or more projects (both under the OPE and ROP) and the total number of respondents in the mailing survey was 880. The financial allocations by the OPE and ROP were basic variables for the quantitative and qualitative analysis.

The regression analysis was based on the publicly available data resources. It followed the PISA methodology and took into account the factors of the socio-economic background of the students and inputs in primary and secondary schools. Support from both national and European resources was taken into account. The primary and secondary school outputs were measured differently. The primary schools had dependent variables (a) the percentage of the early school leavers in primary education ('leavers') and (b) results of the ninth-graders (Test 9) in mother language and mathematics in terms of average mark of school (AMS) and average success rate of the school (ASR). The secondary schools had their dependent variables AMS and ASR in mother language and mathematics.

The social background (independent) variables on district levels included: (1) unemployment rates, (2) average wage in EUR, (3) share of Roma in total population (according to the ROMA Community Atlas), (4) share of urban population., (4) total divorce rate, (5) share of population in material deprivation, (6) share of population in age group 35+ with primary and/or no education, (7) share of population in age group 35+ with lower secondary education, (8) share of population in age group 35+ with higher secondary education, (9) share of population in age group 35+ with tertiary education. The (independent) variables of the education inputs included (10) numbers of students per one full-time teacher, (11) amount of the national public support per student in EUR, (12) amount of the European support per students in EUR, and separately by the OPE and ROP projects. The OPE projects had different variables for the the Measures 1.1/4.1 (targeting soft skills) and 3.1 (targeting Roma community).

The high correlation between the dependent variable 'leavers' and independent variables on the socio-economic background of the students indicate high synergies between the EU2020 targets in education, employment and social inclusion.

The allocations to the investment priorities and methods of evaluation

Two operational programmes support the national target on early school leavers in the programming period 2014-2020: the Operational Programme Human Resources (OPHR, Investment Priorities 1.1, 5.1 and 6.1) and the Integrated Regional Operational Programme (IROP, IP 2.2). The total sum of allocations (including proportional part of the technical assistance) for the target is €431.9m.

The ***specific goal OPHR 1.1.1*** 'Increasing inclusivity and equal access to quality education and improving results and competences of children and students' is key for the achieving national target in early school leavers. The activities supported by this target focus on inclusion of students from disadvantaged environments, innovations in educational programmes and teaching aids, career and upbringing counselling, etc.

The ***OPHR Investment Priority 1.1*** combines the output indicators on numbers of participating students and institutions with the result indicators measuring improvements in skills, competences and introduction of the inclusive programmes.

The output indicators O0072: Number of participants completing activities for improving skills and enhancing literacy and O0073: Number of schools involved in activities oriented on support of the inclusive model of education are combined with the result indicators R0069: Number of participants completing activities improving skills and enhancing literacy, R0070: Number of participants involved in activities for improving skills and enhancing literacy, and whose competences and skills improved within 6 months of programme completion and R0071: Number of supported schools which apply the inclusive model of education. Planned numbers of supported schools (440) and students (39,946) are big enough to apply the regression analysis for evaluation contribution of the ESIF to national target on the regional level. The numbers also allow for mailing survey of the project beneficiaries. Detailed information on the impacts of the ESIF on national target could be obtained via case studies based on in-depth interviews with the project beneficiaries.

The Investment Priority OPHR 5.1 'Socio – economic integration of marginalized communities, such as the Roma' allocates €40.0m. The IP targets end of discrimination by children from the marginalised Roma communities (MRC) in the pre-school education. The suggested result indicators include R0105 Number of children from MRC that completed at least one year in supported kindergartens participating in the activities aimed at support of inclusive education / R0106 Participants from MRC who gained upper secondary (ISCED 3) or post-secondary education (ISCED 4). They are combined with the output indicators CO09 children with primary (ISCED 1) or lower secondary education (ISCED 2) and O0103 Number of kindergartens included in the activities focused on support of inclusive education. The IP supports 210 kindergartens (output indicator O0103) and 150 villages (output indicator O0106).

The Investment Priority OPHR 6.1 'Providing support for physical, economic and social regeneration of deprived communities in urban and rural areas' allocates €50.1m. The specific goal 6.1.2 'Improving access to quality education, including education and care in early childhood' is key for the achieving national target. The output indicators O0195: Number of pre-school facilities built in municipalities with the presence of MRC and O0197: Number of pre-school facilities refurbished in municipalities with the presence of MRC are combined with the result indicator R0146: Number of children from MRC in the

age group 3–6 years, who have completed at least one year of pre-school education. The OPHR IP 6.1 combines output indicators on new and refurbished pre-school facilities with the result indicators on number of children using the facilities. Some 300 facilities will be supported in localities with the MRC. The result indicator assumes the numbers of the MRC children in age group 3-6 years with pre-school education increase from 2,568 in 2014 to 11,391 in 2023. The numbers of supported pre-school facilities are relatively high, but the facilities are concentred in a relatively low number of districts. The regression analysis based on the regional data is not an appropriate method for evaluation of the ESIF contribution to achieving national target. The appropriate methods include survey of student competences and/or project beneficiaries in the OPHR IP 6.1. The survey results should be compare with in-depth interviews with the project beneficiaries.

The Investment Priority IROP 2.2 'Investing in education, training and vocational training, skills and lifelong learning by developing education and training infrastructure' allocates €105m. The following activities are of key importance for achieving national target:

- The specific goal 2.2.1 'Increase of gross school readiness of children in kindergartens' with output indicator O0226: Number of supported pre-primary schools and result indicator R0096: Gross school readiness of children in kindergartens.
- The specific goal 2.2.2 'Improvement of key competences of pupils in primary schools' with output indicator O0227: Number of supported primary schools and result indicator: R0097: Success in Testing 9 language learnt and R0098: Success in natural science.

The output indicators for the IROP IP 2.2 indicate support to 203 pre-school facilities and 420 primary schools. The numbers are big enough for a quantitative analysis via linear regression and also a counterfactual analysis for schools receiving / not receiving support from the ESIF.

3.3.2 Target 'increasing share of population with the tertiary attainment in age specific group to 40% by 2020'

The demographic and economic context of the evaluation

The achievement of the national target in the tertiary education is subject to several factors, including:

1) Demographic trends
2) Interest by young people in the tertiary education. The interest is related to (i) the successful completion of the secondary education, and (ii) job availability and salary after graduation.
3) Investment to the tertiary education.

Methodology for evaluation of the national target

The evaluation has to take into account the aggregate data on development of tertiary education and the case studies. The case studies enable for analysing environment of the intervention and also the strengths and weaknesses of specific interventions. The methodology for evaluation of the target therefore consists of the mix of the quantitative and qualitative methods.

The quantitative (mathematical and-statistical) methods are appropriate for analysis of the demographic developments. The national target is not set in the absolute numbers of people with the tertiary education, but as a share of these people in a specific age group. Achievement of the target by 2020 therefore is subject to following factors:

- numbers and socio-economic structure of population born in period 1986-1990 (including share of children born into the marginalised groups in the total cohort),
- numbers of graduates from the upper secondary education,
- interest by the graduates of the upper secondary education in tertiary education,
- average length of the tertiary study.

The abovementioned parameters are basic inputs for modelling and extrapolation of the time series. The demographic predictions with the socio-economic parameters are standard methods of evaluation of the achievement of the Europe 2020 targets (see Barslund 2012[10]).

The allocations to the investment priorities and methods of evaluation

Evaluation of the ESIF contribution to the national target in tertiary education is no easy task. The interest in tertiary education has been significant in Slovakia with or without the ESIF support. The ***OPHR Investment Priority 1.3*** invests €87.7m (including technical assistance) to the target in tertiary education in the programming period 2014-2020.

The ***OPHR Investment Priority 1.3*** 'Access to employment for job-seekers and inactive people, including the long-term unemployed and people far from the labour market, also through local employment initiatives and support for labour mobility' however, does not target numbers of graduates, but their employability. The output indicator O0077: Numbers of University students is combined with the result indicator R0081: Number of graduates of established profession-oriented bachelor's programmes.

The ***OPHR Investment Priority 1.3*** supports quite diverse activities (mobility programmes, innovative forms of education, changes in curricula, counselling and preparatory courses for students from marginalised communities). Effects of these diverse activities are best to describe via ***qualitative methods***. The best tools for evaluating national target in the University education may include case studies based on interviews with the students, teachers and rectors of the Universities. The case studies

[10] Barslund, M. (2012): Recent Developments in Selected Education Indicators and their Relation to Europe 2020 Targets, National Institute Economic Review April 2012, 220: R6-R16.

may be completed with statistical overviews of the successful completion of the University study and success in finding a job after graduation.

The evaluation of the national target in the University education should not stop with shares of the population with tertiary attainment in the total population. It also should target progress in improving quality of education. The relations between the ESIF interventions and improvements in quality of education can be measures via several quantitative methods. The sample size is small and limited by a total number of Universities. The regression techniques cannot by applied. It is, however, possible to quantify relation between the total amount of intervention allocated to individual Universities (or intervention per one student) on one hand and position of the University in the World Ranking Web of Universities (Webometrics) on the other hand. The Spearman rank correlation coefficient (the Spearman Rho) is applied for quantifying the relation. The computation of the Spearman rank correlation coefficient (in terms of intervention per student) should take into account that the lower-quality Universities use to have lower total numbers of students than good quality Universities. The per student intervention therefore tends to be higher in the lower-quality Universities than in the good quality ones.

3.3.3 Target 'increasing expenditure on research and development to 1.2% GDP by 2020'

The economic context of the evaluation

The impact of the public policies on expenditure on the research, development and innovation was subject of many evaluation studies in the developed countries. Most studies targeted synergies between the public and private resources for R&D. Some studies focused on the effects of the public support on economic results of the enterprises, such as sales, exports, employment and patent applications. The studies usually do not distinguish between the support from the national public and European resources.

The Smart Specialisation Strategy (the RIS3 document) sets that the two thirds of the total gross expenditure on research and development (GERD) should be funded by the private and one third by the public sector. The evaluation literature provides diverse opinions whether the public expenditure on R&D stimulates private expenditure or not. Some older studies suggested that the public support replaces firms' own expenditure in R&D or even decreases it[11] and therefore is inefficient[12]. Some recent studies indicate

[11] Wallsten, S.J. (2000): The Effects of Government-Industry R&D Programs on Private R&D: The Case of the Small Business Innovation Research Program. *The RAND Journal of Economics*, 31(1): 82-100.
[12] For the detailed discussion of effects of tax reliefs on growth of researcher employment and wages see: Lokshin, B., and Mohnen, P. (2012): Do R&D tax incentives lead to higher wages for R&D workers? Evidence from the Netherlands. *Research Policy* 42(3): 723-830.

complexity of the issue of support from public resources[13]. The positive effects of the public support on generation of the business expenditure on R&D (BERD) was reported in 60%, the neutral ones in 20% and the negative ones in 20% of evaluation studies (see Box 7). The most studies on effects of the public support on BERD are based on the counterfactual analysis. The studies employ linear or logistic regression, and/or comparison of indicator means via the t-test or non-parametric tests.

The *Difference-in-Difference* (DiD) method often is used to quantify effects of the public support to R&D, and/or efficiency of businesses. The DiD is an econometrics technique, which uses data obtained from observation to imitate an economic experiment. The method quantifies effects of a specific policy measure (independent variable) on result of the measure (dependent variable). It compares average change in result in the test sample and control sample in two or more time periods.

The effect of public support on BRRD can only be computed in cases, when firms report data on their BERD. The problem was identified in the Pilot Evaluation of R&D in 2015 in Slovakia. The Slovak firms (beneficiaries of the support from the SF and CF) were not obliged to report data on past expenditure on R&D and innovation. The data limitations disabled answering the evaluation question on increase of BERD via the complementary support from the public resources,

The effects of support from the ESIF can be quantified not only for the BERD, but also for the economic efficiency of the businesses. The Pilot Evaluation of the R&D pointed to importance of available and trustworthy data on economic and financial results of the enterprises. The accountancy rules indicate the data on sales are more trustworthy than data on profits. The profits are subject to the tax optimisation in the enterprise, but also within enterprise group. The evaluation procedure indicated need for obtaining good quality data from firms, which apply for support from the national public and European resources. The data on sales and employment are more suitable for comparison than data on the profits, and profitability of the total assets, own assets and/or sales. The reliable and long-term data are not easy to obtain for most firms in the control sample.

[13] Zúñiga-Vicente, J.A., Alonso-Borrego, C., Forcadell, F.J. and Galán, J.I. (2014): Assessing the Effect of Public Subsidies on Firm R&D Investment, *Journal of Economic Surveys* 28(1): 36–67.

Box 7 The effects of public support on BERD

The results of a meta-analysis by Zúñiga-Vicente et al (2014) can be exemplified on the following studies:

González and Pazó (2008) used the matching technique. They tested a hypothesis that public support ousts firm's own resources on R&D on a sample of 9,455 Spanish firms. They found that the public support neither ousts nor stimulates higher BERD. The firms added the public support to their own funds, which would have been invested anyway. The support from the public resources operated better in small firms, which had limited own resources for R&D, and/or in low-tech sectors. The meta-analysis by Becker (2014) came to similar conclusions.

Görg and Strobl (2009) analysed results of the public support to industry research in Ireland (956 grants in 1999 - 2002). The smaller grants had more positive effects on BERD in domestic enterprises, while the larger grants tended to replace BERD. As for the foreign firms in Ireland, the public grants had neither positive nor negative on BERD.

Clausen (2009) analysed data from the business innovation survey in Norway in 1999 - 2001 (the third wave of the EU innovation survey, CIS3). He compared behaviour by 278 supported and 741 unsupported firms. The econometric analysis (regression with the instrumental variable) indicated that the public support targeting research generated synergies with the firm own BERD, while the support targeting development used to oust the firm BERD. The Hottenrott et al (2014) analysed support to 4,827 Flemish projects in 1997 – 2009 and came to very similar conclusion.

Klette and Møen (2012) analysed long-term data on 192 Norwegian firms in the high-tech industries in 1982 - 1995. The supported firms tended to have higher BERD also in time after the support ended. The authors assumed the firms had accumulated experience and knowledge during implementation of the supported project. Such firms are more willing to invest in R&D in the future.

Czarnitzki and Lopes-Bento (2012) analysed potential ousting BERD by the public support on a sample of Flemish 3,019 projects in 2004 – 2010. They used both classical econometric methods (regression) and the in-depth interviews with the managers of the Flemish government agencies supporting R&D. The authors concluded the public support did not oust BERD, but generated synergic effects (including growth in researcher employment), also in case of the repeated support.

Source: authors' review.

The selected methods for identifying synergic effects of the ESIF

The synergic effects of the ESIF interventions can be analysed on the macro- and micro-levels. The macro-economic models based on (i) the production function (Cobb-Douglas), (ii) macro-economic models, and (iii) the data envelopment analysis can be used to analyse synergies between the three growth priorities:

(i) J. Vogel (2015) used the production function to analyse impact of the R&D investment and investment to the human capital on growth in the total factor productivity (TFP) in 159 regions of the EU15 countries in 1992-2005. The production function identified direct impact of the investment in human capital on growth in TFP and big indirect effect of the R&D investment on growth in TFP in

manufacturing industries. Strauss and Samkharadze (2011) used the EUKLEMS database (now the AMECO database) on growth in fixed investment and human capital in manufacturing industries of 12 EU Member Countries and the USA. They used the production function to quantify contribution of the information and communication technologies (ICT) to economic growth and growth in the TFP. The marginal productivity in the ICT sector was higher than share of ICT in the total investments. The finding, however, was valid only in cases when investment in the ICT was accompanied by the investment in the highly-skilled professionals.

(ii) The evaluation study 'The Analysis of Impact by the Cohesion Policy via an Econometric Model' states (p. 4) that the additional average economic growth generated by the SF and CF investment was 0.7-1.2 percent in period 2009-2013. The study did not provide for decomposition of the factors of the economic growth and data on contribution by the SF and CF to the factors of growth. Data on the ESIF contribution to growth in TFP would provide a valuable information on how the ESIF contribute to the long-term sustainability of the Slovak economic and social system. The prediction by the European Commission indicates the TFP would be main factor of economic growth in the future in Slovakia (EC 2015).

(iii) The data envelopment analysis (DEA) often is used to quantify the synergies between the growth priorities. The DEA enables to quantify existing efficiency frontier for each growth priority and aggregate partial indicators for all three priorities. The national targets of the EU2020 Strategy are used for partial indicators in the DEA. The aggregate indicators enable to identify how far a specific country is from the efficiency frontier and which combination of policies should be used to achieve the efficiency frontier. The Box 9 provides for an overview of the DEA studies in the abovementioned field.

The synergies between the growth priorities can be evaluated also on the micro-level. An example can be provided: evaluation of the projects supported in fields of intervention (061) Research and innovation activities in private research centres including networking, and (065) Research and innovation infrastructure, processes, technology transfer and co-operation in enterprises focusing on the low carbon economy and on resilience to climate change. The evaluation identifies projects with similar activities in the abovementioned fields of intervention and compares selected outputs of the projects, for example (i) increase in competitiveness via increase in sales and/or exports, and (ii) achieved process innovation in field of the energy savings.

If firms benefiting from intervention under the (065) field account for better results than firms benefiting from intervention under the field (061) the conclusion emerges that the better outcomes follow from synergies between the intelligent and sustainable growth. Performance of the evaluation is subject to the (i) existence of a large sample of data on the firms' economic outcomes, and (ii) existence of a large sample of firms (at least 50-100 units). The evaluation may be based on the regression method (e.g. regression with an interactive member) or a simple t-test. The data preparation method via the propensity score matching is suggested before the regression exercise.

Box 8 Using DEA for evaluating synergies between the growth priorities

Lábaj et al (2014) used the DEA for quantifying synergies between the smart, inclusive and sustainable growth in the EU27, Norway, Iceland and Switzerland. The smart growth was defined via indicators of labour force, capital stock and size of the gross domestic product (GDP). The greenhouse emission defined the sustainable growth and the income inequalities the inclusive growth. The authors constructed seven models of growth, based on different combinations of labour, capital, income inequalities and greenhouse emissions. The Nordic countries and the UK, Germany and France mostly appeared on the efficiency frontier. The authors also decomposed economic growth and took into account contribution of the economic and ecologic factors to the TFP. The analysis indicated important contribution of the technology advance to ecology resource savings in the sample of analysed countries.

Burja and Burja (2013) used similar method to Lábaj et al (2014), but selected different sets of countries and indicators. The authors used the DEA for analysing synergies between the smart, sustainable and inclusive growth in ten New Member Countries of the EU. The efficiency frontier for the (i) smart growth was defined via the per capita GDP in the purchasing power parity (PPP) and the global competitiveness index; for the (ii) inclusive growth via the Human Development Index, and for the (iii) sustainable growth via the Index of the Environmental Development (the index is provided by the Yale University in the USA). The Czech Republic and Slovenia were on the efficiency frontier, followed by Slovakia and Estonia. Romania and Bulgaria were the last ones. The authors used the comparative analysis to explore diverse scenarios of the economic, social and ecologic developments, which would help Romania to get on the efficiency frontier.

Bosseti and Buchner (2009) used the DEA for quantifying 11 scenarios for economic and social policies till 2100, depending on developments in the greenhouse emission in the countries accessing to the Kyoto Protocol. The predicted cumulative GDP till 2100, increase in the global Earth temperature and the Gini coefficient of the income inequalities were used for computation of the efficiency frontier. The authors concluded that policies aimed at dramatic decreases in the greenhouse emissions are best for sustaining economic and social development.

Halkos et al (2015) used the for computing index of sustainable economic and environmental development in 20 OECD Member Countries in 1990-2011. The economic development was characterised via size of the labour force, capital stock, and size of the GDP. The environmental development was characterised via development in the greenhouse emission. The Nordic countries and Switzerland were on the efficiency frontier. The USA, Canada and most EU15 Member Countries remained deeply below the efficiency frontier, because of the continuing greenhouse emissions.

Hudrlíková (2013) used indicators of the eight national targets of the Europe 2020 Strategy for computing efficiency frontier in the DEA analysis. The author used several alternative methods for indicator weighting to compute sensitivity test for ranking the EU28 Members (according to weighting method). Notwithstanding diverse weighting methods the country rankings were quite similar to each other. The Nordic countries always appeared on the top of the list, while the southern and new EU Member Countries, and the USA were placed on the bottom. The Groshek (2015) used similar procedure and used the DEA to rank countries according to the eight national targets of the EU2020 Strategy.

Source: authors' review.

The allocations to the investment priorities and methods of evaluation

The national target to achieve GERD 1.2% GDP by 20202 concentrates substantial amount of interventions by the ESIF (€1604.9m).

The OPRI Investment Priorities 1.1 and 2.1 'Enhancing research and innovation infrastructure and capacities to develop research and innovation excellence, and promoting centres of competence, in particular those of European interest' in the the non-Bratislava and Bratislava regions concentrate 60.8% of total intervention allocated to the national targets, The OPRI IP 1.1 and 2.1 therefore are key for achieving the target. The fields of intervention (056-060) support infrastructure of research and innovations in the small and medium enterprises (SMEs), large enterprises and public sector (including science-technology parks). The output indicators measuring infrastructure development are combined with result indicators measuring outputs of institutions, which benefit from the infrastructure. The output indicator CO01 (number of enterprises granted support) sets several dozens of public and private institutions, for which the intervention is designed. The result indicators target numbers of the patent applications (R0126), number of participations in projects involving international co-operation (R0042) a number of publications by Slovak organisations in the Web of Science Core Collection and SCOPUS databases (R0126).

The evaluation of the impact of the ESIF infrastructure projects on increase in the GERD can be done via the case studies, in-depth interviews with the project beneficiaries and firms settled in the science-technology parks.

The OPRI Investment Priorities 1.2 and 2.2 'Enhancing research, development and innovation capacities in industry and services' in the non-Bratislava and Bratislava regions concentrate about 34.5% of the total allocations for the national target in GERD. The fields of interventions no. 002, 061, 062, and 064 support research and innovation processes in enterprises and technology transfers.

The output indicator CO01: (number of enterprises granted support) is combined with the results indicators R0044 and R0045: Amount of private investments in research and development in Slovakia (and Bratislava region respectively). The planned numbers of supported enterprises (2200) and amount of private expenditure on R&D (over €600m) are big enough for the large-scale counterfactual analysis. The evaluation of the ESIF contribution should employ procedures of the counterfactual analysis (the DiD method in particular) and focus on two areas:

- The multiplying effect of the public expenditure on R&D on the private one,
- The impact of the public expenditure on R&D on economic and financial indicators of firm (sales in particular).

3.4 Data resources and availability

The data for evaluating of achievement of national targets set by the Europe 2020 Strategy and specification of synergies between the growth priorities are available on the project level (output indicators) and regional levels (result, impact and context indicators).

Indicators for analysing target 'decreasing rates of early school leavers under 6% by 2020'

The Eurostat is the prime resources for data on the result and context levels. An analysis of factors determining achievement of the target indicated a crucial role of the socio-economic background of the students' parents. The Statistical Office of the Slovak Republic (SOSR) provides data on the district level. Data on economic, social, and demographic indicators are available (education attainment, average wage, divorce rates). The Central Office of the Labour, Social Affairs and Family (COLSAF) provides data on the unemployment, social benefits and material deprivation. The Slovak Centre for Scientific and Technical Information (SCSTI) provides data on the drop-out rates and numbers of teachers. The Ministry of Education, Science, Research and Sports (MESRS) provides data on financial support to education from the national and European resources.

The pilot evaluation of the target in education focused on the demand-driven projects. These projects generated most data on the regional levels. The National Projects, however, accounted for significant part of the total support from the European resources. The future evaluations may benefit from data specifying proportional allocations by the national projects on the beneficiary levels. It will help quantifying amount of resources received by the beneficiaries both from the demand-driven and national projects.

There is an interesting opportunity to evaluate results of the interventions on the project level. The projects targeting marginalised communities and/or districts with high incidence of the social exclusion should report students' achievements before and after implementation of the project. In the same time, data on social and economic situation of students' parents should be collected. The data requirements should be added to particular calls.

Indicators for analysing target on 'population with the tertiary attainment'

The Eurostat and SOSR are key data providers for the data on the target. The data refer to total population and educational attainment in the age-specific group 30-34. Data on the demographic structure of the Slovak population (provided by the SOSR) and data on students and higher education institutions (provided by the SCSTI) are important for prediction of target on tertiary attainment.

The project-level data should indicate numbers of students, who benefited from the ESIF in specific investment priorities.

Indicators for analysing target 'research and development' in the Europe 2020 Strategy.

The Eurostat and SOSR are key data providers for the data on the target on the result and context levels. The data concern gross expenditure on research and development (GERD) and breakdown of GERD by source of funds and sector of performance. The abovementioned data, however, do not allow to specify, whether the support from the national and European resources had complementary or substitute effect on firms' own expenditure on R&D (Business expenditure on research and development, BERD).

The business sector should provide 2/3 of the total GERD by 2020. It is therefore very important to know, whether the support from the national and European resources had complementary or substitute effect on BERD. The SOSR provides aggregate data on the BERD. Data on firm level currently are not available. It is currently impossible to know whether the support from the national and European resources had complementary or substitute effect on the BERD. The businesses applying for the European support should report following data:

- The structure of BERD, broken down on research and development;
- The history of BERD in nominal terms and relative terms (BERD / turnover) [14].

The Managing Bodies should also provide data on the national public support to business in the past (grants by the SRDA agency, amount R&D stimuli, the grants from the Structural and Cohesion Funds in programming period 2007 - 2013).

Indicators for analysing synergies between the targets and priorities of growth

The following data resources are suggested for analysing synergies on the macro level:

- The Data Envelopment Analysis (DEA) traditionally is used for the country-level multi-criterial evaluation in all three priorities of growth. The DEA can be applied also for evaluating synergies between the smart growth and inclusive growth, and smart growth and sustainable growth. The DEA provides context indicator for the evaluation. The DEA would suggest how far the Slovak Republic from the efficiency frontier is, and which combinations of the growth priorities should pre preferred in the future. The Eurostat provides data needed for the DEA analysis. The DEA data de facto are indicators of the Europe 2020 Strategy.
- The analysis of the economic growth via the production function (the Cobb-Douglas function) is appropriate for describing synergies between the smart growth (in terms of the Total Factor Productivity, TFP) and the inclusive growth (in terms of increase in numbers and skills of the labour force). The SOSR and the AMECO macroeconomic database of the European Commission provide data needed for the analysis of the economic growth via the production function.

As for the micro-level, the synergies between the smart and sustainable growth are of interest. The output indicators O0072 (number of IPR applications) and O0073 (number of patent applications) enable for distinguishing, whether the eco-innovations were project outputs.

The synergies between the smart and inclusive growth are harder to spot on the micro-level, as the technology-intensive investments used to decrease demand on labour. The output indicator CO08 (increase in employment in firms benefiting from the support) may not provide a realistic assessment of impact by new technologies on employment. It is better to use the production function on the macro-level.

[14] The data from the statistical survey on the 'Innovation activities by the Slovak enterprises do not allow for distinguishing firms' own resources for R&D and resources used for co-financing projects funded from the EU resources. It therefore is impossible to find whether the EU resources are used in complementary or substitutive way for firm R&D expenditure.

3.5 Smart growth: allocations to main targets and synergies

The synergies between the growth priorities, national targets of the Europe 2020 Strategy, and thematic objectives 1-11 are identified via the field of intervention in this chapter. The thematic objectives and the fields of intervention are defined by the Regulation (EU) No 1303/2013 of the European Parliament and of the Council of 17 December 2013 and the European Maritime and Fisheries Fund and repealing Council Regulation (EC) No 1083/2006.

The synergy size is defined via the financial allocation to those particular fields of interventions, which are falling between two growth priorities (outside the scope of the key operational programme).

The synergy effects are measured via a combination of output and result indicators for specific field of intervention.

The indicators for synergies are detailed in the synergy matrices for all operational programmes, three growth priorities and the thematic objectives.

The total allocations by the European resources to intervention fields supporting the smart growth in the programming period 2014-2020 account for €4,395.5m, of which:

- The national target 'decreasing rate of early school leavers under 6% by 2020' '€431.9m (9.8 %);
- The national target 'increasing share of population with the tertiary attainment in age specific group to 40% by 2020' €87.7m (2.0%);
- The national target 'increasing expenditure on research and development to 1.2% GDP by 2020' €1604.9m (36.5%);
- Interventions in smart growth outside national targets €2271.0m (51.7%).

Three operational programmes concentrate most of their allocations in the smart growth: OPRI, OPEPA, and OPF.

The Operational Programme Research and Innovations allocates European resources €2,296.8m (less the technical assistance), of which €2,196.8m to the smart growth, €87.4m to the sustainable growth and €5.6m to the inclusive growth (including proportional part of the technical assistance, Table 2).

As for the smart growth priority the OPRI invests mainly to the target 'increasing expenditure on research and development to 1.2% GDP by 2020'. The following fields of intervention concentrate most allocations:

- 056-059 (research and innovation infrastructure, total €813.6m)
- 002, 060-061 and 064 (research and innovation activities and processes, total €590.9m)
- 062 (technology transfer and university-enterprise co-operation primarily benefiting SMEs, total €163.6m).

The intervention logic assumes that increase in expenditure on research and developments is achieved either directly (via investment in the infrastructure, technologies and equipment, and/or indirectly, via increased capacity of the public and private institutions for generating research.

The support to the competitiveness of the Slovak economy (the smart growth generated by factors outside the research and development) is the second major theme of the OPRI. The key intervention fields include:

- 001 and 004 (generic productive investment, total €206.8m),
- 063, 066 and 067 (clusters and advanced support services for SMEs, incubations and spin-offs, total €313.1m),
- 076 a 077 (development and promotion of cultural and creative services, total €21.9m).

In this theme the intervention logic is based mainly on the productive investments, non-technology innovations and development of the business sector via advanced support services for businesses and innovations. It is assumed that the abovementioned activities increase SMEs survival, profitability and shares in total exports and gross value added.

The Operational Programme Effective Public Administrative (OPEPA) allocates the total European resources €278.5m. All interventions by the OPEPA concentrate in the smart growth. The operational programme has two investment priorities:

- Strengthening institutional capacities and efficiency of the public administration;
- Efficient judicial system and increased law enforceability.

Both priorities fall into the intervention field 119 (investment in institutional capacity and in the efficiency of public administrations and public services at the national, regional and local levels with a view to reforms, better regulation and good governance). The intervention logic assumes that the available, efficient and transparent public services support the civil society and business environment.

The Operational Programme Fisheries (OPF) allocates the European resources €15.79m, of which €13.5m is channelled into the smart growth (the thematic objective 3, plus a proportional part of the technical assistance. The operational programme has six investment priorities ('specific targets'), of which five support general smart growth (outside the EU2020 targets). The following specific targets support the smart growth:

- 2.2 (enhancement of the competitiveness and viability of aquaculture enterprises, including improvement of safety or working conditions, in particular in SMEs);
- 3.1 (the improvement and supply of scientific knowledge and collection and management of data);
- 3.2 (support for monitoring, control and enforcement, enhancing institutional capacity and an efficient public administration without increasing the administrative burden),
- 5.1 (improved market organisation for fishery and aquaculture products);
- 5.2 (encouragement of investment in the processing and marketing sectors).

The intervention logic assumes that the support to innovative processes, technologies and equipment in the aquaculture contributes to the smart growth.

Table 2: The map of allocations for the OPRI, OPEPA, and OPF to targets in the smart growth

Smart growth	Interventions in smart growth outside national targets	Early school leavers	Population with the tertiary attainment	Share of GERD in GDP
OPRI 1.1				(056 - 060) €856.4m
OPRI 1.2	(001,004,063,066,067) €199.4m			(002,061,062, 064) €538.1m
OPRI 2.1				(056 – 060) €119.8m
OPRI 2.2	(001,063) €6.0m			(002,061,062,064) €14.9m
OPRI 3.1	(001, 063) €118.2m			(056,064) €25.1m
OPRI 3.2	(066,067) €176.5m			
OPRI 3.3	(076,077,082) €26.6m			
OPRI 4.1	(001,066,067,076,077) €21.7m			(056) €1.0m
OPRI TA	(121-123) €17.5m			(121-123) €49.6m
OPEPA 1.1	(119) €234.1m			
OPEPA 2.1	(119) €33.2m			
OPEPA TA	(121-123) €11.1m			
OPF 2.2	€7.2m			
OPF 3.1	€0.7m			
OPF 3.2	€0.7m			
OPF 5.1	€2.0m			
OPF 5.2	€2.0m			
OPF TA	(121 - 123) €0.8m			
Total	**€857.8m**			**€1604.9m**

Source: Financial plans by the operational programmes. Notes: (073) €5.6m = the intervention code and allocation in €m.

3.5.1 Synergies with the inclusive growth

The synergies between the smart and inclusive growths are limited, and sometimes negative. Many modern technologies tend to replace jobs. The synergies between the smart and inclusive growth (defined by allocations to intervention fields) are generated via the OPRI activities related to the creation of the social enterprises. The operational programme invests €5.8m (including the proportional part of the technical assistance) to the target 'decreasing share of population at the risk poverty or social exclusion' (Table

3). The investment priority 3.1 contains the specific target 3.1.1 and supports 'social innovation, i.e. the support of disadvantaged social groups of people (women, young people under 30 years, senior people over 50 years, long-term unemployed, third-country nationals, handicapped people, the Roma, etc.)' via intervention field 073 (Support to social enterprises, SMEs). The effect of the synergy can be measured via the combination of the output and result indicators: O0078 Number of new SMEs established by individuals from disadvantaged social groups (specific) - R0048 Survival rate of new enterprises on the market after two years.

The operational programmes Effective Public Administration and Fisheries have no allocations to the intervention fields in the inclusive growth.

Table 3: The map of synergies between the smart and inclusive growth by codes of intervention

Smart growth	Interventions in inclusive growth outside national targets	Employment rate	Decreasing share of population at the risk of poverty or social exclusion
OPRI 3.1			(073) €5.6m
OPRI TA			(121-123) €0.2m
Total	€0.0m	€0.0m	€5.8m

Source: Financial plans by the operational programmes. Notes: (073) €5.6m = the intervention code and allocation in €m.

3.5.2 Synergies with the sustainable growth

The synergies between the smart and sustainable growth (defined via allocations to intervention fields) are visible in following areas:

- Improving energy efficiency in firms (via the research and technology transfers aimed at the low-carbon economy and resilience to climate change). The synergies are mainly supported by the OPRI.
- Investment to the ecological transport (mainly railways and public passenger transport), and to the information and communication technologies built-in the environmental infrastructures. These synergies are mainly supported by the Operational Programme Integrated Infrastructure.

The Operational Programme Research and Innovations (OPRI) generates synergies mainly in the sustainable growth priority (Table 4). The OPRI invests €81.6m into the targets on the energy efficiency and €6.0m into the target on decreasing the CO2 emissions:

- *The investments priorities 1.2 and 2.2* 'Promoting business investment in research and innovation (in the Bratislava Region)' support the eco-innovations

via the intervention field 069 (Support to environmentally-friendly production processes and resource efficiency in SMEs). The list of output and result indicators contains no specific indicators for eco-innovations. The synergy effects can be captured via combination of the output and result indicators: CO01 Number of enterprises granted support (common) - R0046 Share of enterprises implementing research, development and innovation, or R0047 Number of enterprises with innovation activities in the Bratislava region. The businesses declaring eco-innovation should be taken into account in the synergy evaluation.

- *The investment priority 3.1* 'Promoting entrepreneurship' contains intervention fields 068 (Energy efficiency and demonstration projects in SMEs and supporting measures) and 069 (Support to environmentally-friendly production processes and resource efficiency in SMEs). The contents of the priority set no specific indicators for the sustainable growth. The synergy effects can be captured via combination of the output and result indicators: CO01 Number of enterprises granted support (common) - R0048 Survival rate of new enterprises on the market after two years. The businesses declaring eco-innovation and process innovations targeting energy consumption should be taken into account in the synergy evaluation.
- *The investment priority 4.1* 'Supporting the capacity of SMEs to grow' contains intervention field 069 (Support to environmentally-friendly production processes and resource efficiency in SMEs). The contents of the priority set no specific indicators for the sustainable growth. The synergy effects can be captured via combination of the output and result indicators: CO01 Number of enterprises granted support (common) - R0130 Share of profit-making SMEs in the Bratislava Region. The businesses declaring eco-innovation should be taken into account in the synergy evaluation.

The Operational Programme Fisheries (OPF) generates some limited synergies in area of the sustainable growth. The specific target 2.3 'Protection and restoration of aquatic biodiversity and enhancement of ecosystems related to aquaculture and promotion of resource efficient aquaculture' tackles the need for innovative technologies and processes in farms for resource efficient and sustainable aquaculture, increasing production while protecting the environment. The total allocation to the synergy (including proportional part of the technical assistance) is €2.3m. The synergy effects can be captured via combination of the output and result indicators: 2.2 Number of projects for productive investments in aquaculture and 2.5 Change in the volume of production: recirculation system (in tonnes).

The Operational Programme Effective Public Administration makes no allocation to the intervention fields in the sustainable growth.

Table 4: The map of synergies between the smart and sustainable growth by codes of intervention field

Smart growth	Interventions in sustainable growth outside national targets	Energy efficiency	Decreasing CO2 emission	Renewable energy resources
OPRI 1.1			(065) €6.2m	
OPRI 1.2		(069) €51.2m		
OPRI 2.1			(065) €2.1m	
OPRI 2.2		(069) €1.4m		
OPRI 3.1		(068. 069) €24.4m		
OPRI 4.1		(069) €2.0m		
OPRI TA		(121 - 123) €2.5m	(121 - 123) €0.3m	
OPF 2.3	€2.2m			
OPF TA	(121 - 123) €0.1m			
Total	**€2.3m**	**€81.6m**	**€8.6m**	**0**

Source: Financial plans by the operational programmes. Notes: (073) €5.6m = the intervention code and allocation in €m.

4 Inclusive growth

The fourth section starts with 'inclusive growth' definition in the chapter 4.1. The following chapter 4.2. defines national targets for the inclusive growth.
The chapter 4.3 presents the quantitative and qualitative methodology approaches to evaluation of the EŠIF contribution to the inclusive growth. The achievement of the national targets of the EU2020 Strategy is subject to social, economic and demographic context. The chapter 4.3 analyses impact of the context on the choice of the evaluation methods. The chapter also presents examples of applications of the methods in the past evaluations. The main investment priorities for achieving national targets are listed in the final part of the chapter. The chapter presents investment allocations and key activities of the investment priorities, and combination of the output and result indicators for evaluating contribution of the ESIF to achievement of the two national targets.
Sub-chapter 4.3.1 is focused on achieving the national target in employment rate in the age group 20-64 years – i.e.,72% in 2020. It shows the benefits and the limitations of qualitative and quantitative methods and socio-economic context that may affect the choice of methods for evaluation. In the sub-chapter we also present examples and case studies of the use of methods in assessing the impact of interventions in Slovakia. In the second part of sub-chapter 4.3.1 there are specific operational programs, investment priorities or priority axes contributing to the achievement of national targets of inclusive growth. Included is justification for assigning specific investment priorities to the national targets of inclusive growth, the amount of allocations and appropriate combinations of output and outcome indicators as well as contextual sources of statistical data.
The same logical structure and functional content can be also found in subsection 4.3.2, addressing national target to reduce the proportion of the population at risk of poverty and social exclusion to 17.2% in 2020 (from 20.5% in 2012). Section 4.3 also gives examples of the use of these methods in previous assessments.
The chapter 4.4 summarises key data sources, which are needed for evaluating contribution of the EŠIF to achievement of the national targets and for evaluating synergies between the growth priorities. The chapter also identifies fields of evaluation with lack of data (Gap Analysis) and suggests procedures for the data generation.
The chapter 4.5 firstly analyses allocations by the operational programmes to the inclusive growth priority. It also lists allocations, which fell under the priority, but are outside the specific national targets. The chapter also lists a table with a map of allocation by the OPHR, IROP and OPII to targets in the inclusive growth. The table lists fields of interventions and amounts of allocations for each investment priority by the abovementioned operational programmes. The subchapters 4.5.1 and 4.5.2 map synergies between the inclusive growth on one hand, and sustainable and smart growths on the other hand. These subchapters also include selected indicators for synergies evaluation.

4.1 Definition of the Inclusive Growth

The Inclusive Growth means fostering a high-employment economy delivering social and territorial cohesion. The EU2020 Strategy defines Inclusive Growth in following way[15]:

'The inclusive growth means empowering people through high levels of employment, investing in skills, fighting poverty and modernising labour markets, training and social protection systems so as to help people anticipate and manage change, and build a cohesive society. It is also essential that the benefits of economic growth spread to all parts of the Union, including its outermost regions, thus strengthening territorial cohesion. It is about ensuring access and opportunities for all throughout the lifecycle. Europe needs to make full use of its labour potential to face the challenges of an ageing population and rising global competition. Policies to promote gender equality will be needed to increase labour force participation thus adding to growth and social cohesion'.

4.2 The national targets for the Inclusive Growth

The national targets in the EU2020 Strategy refer to:

1) Achieving employment level 72% in the age specific group 20-64 by 2020;
2) decreasing share of people in risk of poverty and social exclusion to 17.2% by 2020 (from 20.5% in 2012.

4.3 The methodological approaches (quantitative and qualitative) for evaluating contributions to the Inclusive Growth

4.3.1 Target 'achieving employment level 72% in the age group 20-64 by 2020'

The starting point for the analysis of the national target of achieving certain level of employment rate of age group 20-64, is a knowledge of the broader socio-economic context of economic growth and the labour market. Employment growth, not only as part of the Europe 2020 objectives, but as the primary objective of national economic policy is a result of many factors. Besides of (capital) expenditures of the public sector (mainly EU funds), the growth (change) in employment in Slovakia is mainly affected by the activity of foreign investors, legislative changes (especially the tax levy legislation and labour market policies), labour migration, phase of the economic cycle as well as by the focus of the education system and demographic trends, etc. Specific problems of the Slovak economy include: weak links between economy growth and job creation, long-term unemployment, youth unemployment and the situation of marginalized groups in the labour r market. The determining factor in relation to the national target of strategy Europe 2020 in the employment is active labour market policies (including implementation of EU funds). In order to maximize value added, evaluation and analysis

[15] Communication from the Commission, Europe2020 (2010): A strategy for smart, sustainable and inclusive growth, European Commission, Brussels, 3.3.2010 COM(2010) final, pp. 18-19.

is necessary to focus on the supply side (human capital), but also the demand side (employers, potential employers).

Appropriate quantitative and qualitative methods

Investment priorities of the OPHR, IROP and OPII are mostly focused to human capital (catalyse employability at the labour market) and/or road/highway infrastructure (there is direct impact on employment growth, particularly in the construction sector but the low rate of job sustainability). In the case of OPHR mainly indirect effects on jobs creation are expected. In the selection of appropriate analytical methods have to be taken into account this kind of restriction. Selection of appropriate method is influenced by minimum amount of intervention (limiting factor of econometric methods) and the number of project, beneficiaries or the size and variability of the target group.

Data envelopment analysis (DEA) – method is limited by the criteria that must meet so called decision-making unit (DMU). For example, DMU can be supported schools, while the input variables can be allocation and output variable number of unemployed graduates or the school's performance in Monitor 9. Similarly, the marginal efficiency can be analysed at lifelong learning or building of administrative capacity at employment providers of services.

Counterfactual method can be used, in case of a higher number of beneficiaries (broad target group), especially in certain investment priorities OPHR as part of active labour market policy. In many cases, interventions are targeted to sufficient number of beneficiaries. It allows large and comparable groups supported and unsupported respondents (beneficiaries, project participants) using the propensity score matching method.

This method has also been implemented in case of the Slovak Republic. Counterfactual methods were implemented in the assessment of selected measure of OP Competitiveness and Economic Growth (measure 1.1.1.- technology transfer to enterprises) by M. Stefanik[16]. Additionally, active labour market policy measures (at the level of unemployed persons) were evaluated in the analytical study (Stefanik et al., 2015)[17]. Moreover, counterfactual evaluation of selected measure of active labour market policy were also applied by Karasová – Štefánik (2015)[18].

[16] Štefánik, M. (2015). Cost-benefit analysis (CBA) : Task 2 Chapter 9. In BONDONIO, Daniele - NEMEC, Rastislav. Evaluation of selected structural funds and cohesion fund interventions using counterfactual impact evaluation methods : final reports. - Bratislava : KPMG Slovensko, 2015, p. 187-197. Kapitola vyšla aj v slovenčine Štefánik M. Úloha 2, kap. 10 Analýza výnosov a nákladov (CBA analýza). [Bratislava] : KPMG Slovensko, 2015. S. 197-207.

[17] Štefánik, M., Lubyová, M., Dováľová, G. a Karasová, K. (2014). *Analýza účinkov nástrojov aktívnej politiky trhu práce : výstup v rámci aktivity A3-T5*: Problematika trhu práce podľa regionálnych a odvetvových rozdielov (*Impact evaluation of interventions of active labour market policy*). Bratislava : Centrum vzdelávania Ministerstva práce, sociálnych vecí a rodiny SR, 2014. 222 s.

[18] Karasová, K. a Štefánik, M. (2016) Vyhodnotenie účinnosti opatrenia - príspevok na dochádzku za prácou : 6. kapitola = Evaluating the impacts of the intervention - Contribution to commuting. In Lubyová, M. a Štefánik, Miroslav. Trh práce na Slovensku 2016+. 1. vyd. - Bratislava : Ekonomický ústav SAV : Prognostický ústav SAV, Centrum spoločenských a psychologických vied SAV : Filozofická fakulta, Univerzita Komenského v Bratislave, 2015, s. 157-179. ISBN 978-80-7144-255-4.

Case studies (Best Practices) can be a complementary method used for assessment of large infrastructure projects or alternatively the primary method especially for small projects (limited number of respondents) or in case of missing hard data.

Cost Benefit Analysis (CBA); assess relationship between the costs (public funds) and revenues (benefits) resulting from implementation of the measure. In Slovakia, the method was applied in the study Stefanik et al. (2015).

Econometric modelling (HERMIN, CGE); is adequately used at assessment of investments in physical infrastructure that generate jobs directly. CGE modelling permits quantify the impact on the level of the operational program or priority axis to employment. The analysis can go up to level of 60 sectors but accuracy of the obtained results may to be limited. However, use of advanced econometric models is determined by a certain (minimum) level of total allocation. Given the priority axes provide a limited set of output and outcome indicators (so impact on employment growth is not possible to quantify) the quantity and quality of the necessary statistical data (especially in the case of regional models) including contextual data are highly important. As an example, econometric modelling and variant scenarios impact assessment of cohesion policy in Slovakia were carried out by Radvanský (2014). The HERMIN model that is a covering small-open economy considers the structure of the cohesion policy instruments, was used in evaluating the implementation of EU funds in the Slovakia (programming period 2007 – 2014) [19]. This study also depicted assumptions as well as model limitations (pp. 109 - 107).

Regression analysis, statistical analysis can be used in the case of sufficient number of projects/beneficiaries, sufficient target group size, number of participating stakeholders as well as hard data.

Qualitative methods (questionnaire survey, focus groups, interviews) are usually used in the case of projects (or project indicators) with insufficient hard data or effects are difficult to quantify because there is mainly soft outputs on place.

Allocations to investment priorities and evaluation methods

Target achieving employment level 72% in the age group 20-64 by 2020 is covered during programming period of 2017-2020 by following operational programmes: OPHR, IROP, OPII, RDP:

- The Operational Programme Human Resources (investment priorities 1.2, 1.4, 2.1, 3.1, 3.2, 3.3, 4.1 a 6.2)
- The Integrated Regional Operational Programme (investment priorities 1.1, 2.2 and 3.1)
- The Operational Programme Integrated Infrastructure (priority axes 2 and 6)
- The Rural Development Programme (Priority 6)

[19] Government Office SR. 2014. Posúdenie vplyvov politiky súdržnosti na rozvoj Slovenska s využitím vhodného ekonometrického modelu. Hodnotiaca správa 2014. Bratislava: KPMG Slovensko spol. s r.o., http://nsrr.sk/sk/hodnotenie/programove-obdobie-2007---2013/

The Operational Programme Human Resources allocates €1310.3m to fulfil objectives through following investment priorities:

Investment priority 1.2 OPHR 'Improving the labour market relevance of education and training systems, facilitating the transition from education to work, and strengthening vocational education and training systems and their quality, including through mechanisms for skills anticipation, adaptation of curricula and the establishment and development of work-based learning systems, including dual learning systems and apprenticeship schemes' allocates €97.7m.

Intervention logic is aimed at promoting employment through improving the education system and youth employment. It represents indirect impact of the intervention on the job creation.

The proposed performance indicators are as follows: R0076 Number of participants who completed activities oriented on the support of the dual education system and practical training with employers, and O0076 Number of participants who completed activities oriented on the support of the dual education system and practical training with employers. High number of planned attendees (34329 + 1754) benefiting from investment priority allows to use numerous quantitative and qualitative methods (or their combination) such as questionnaire survey, regression analysis, non-parametric statistical methods and field research (interviews, focus groups).

The possibility of using several methods allows to results triangulation. Given the potentially large number of participants, regional comparison may to be appropriate. As part of the investment priority, it is monitored following indicator R0077 Number of newly created or innovated apprenticeship courses incorporating elements of the dual system of education and practical training with employers (planned value is 201 + 30). Moreover, to the above-mentioned methods, case studies (e.g. focused on the best practices) or counterfactual analyses (e.g. comparison of supported and unsupported students) may be used. In the case of DEA method, regions (at level of NUTS III, NUTS IV) or supported schools may to be the decision-making units. Alternatively, following groups may to be used as respondents: teachers, parents, students, potential employers, self-government, etc.. The data sources are mainly ITMS2014+, monitoring reports as well as the contextual economic, social, demographic, and administrative data at national or regional level that are provided by the Statistical Office of the Slovak Republic, Slovak Centre of Scientific and Technical Information, Ministry of Education, Science, Research and Sport of the Slovak Republic as well as Central Office of Labour, Social Affairs and Family.

Investment priority 1.4 OPHR: 'Enhancing equal access to lifelong learning for all age groups in formal, non-formal and informal settings, upgrading the knowledge, skills and competences of the workforce, and promoting flexible learning pathways including through career guidance and validation of acquired competences' allocates €55.1m. Intervention logic is aimed at promoting employment through increasing skills via lifelong learning. Proposed indicators are as follows: R0085 Participants gaining or improving a qualification upon leaving, and O0082 Number of participants involved in LLL activities (12936 + 3234). High numbers of beneficiaries are precondition for the application of different methods, such as statistical evaluation method, linear regression, questionnaire survey and field research.

The possibility of using several methods allows to results triangulation. Given the potentially large number of participants, regional comparison or counterfactual analyses may to be carry out. In case of qualitative methods, participants of lifelong learning, potential employers as well as regional branches of Central Office of Labour Social Affairs and Family may to become respondents. The main data sources are mainly ITMS2014+, monitoring reports as well as the contextual economic, social, demographic, and administrative data at national or regional level that are provided by the Statistical Office of the Slovak Republic, Slovak Centre of Scientific and Technical Information, Ministry of Education, Science, Research and Sport of the Slovak Republic as well as Central Office of Labour, Social Affairs and Family.

Investment priorities 2.1 OPHR 'Sustainable integration into labour market of young people, in particular those not in employment, education or training, including young people at risk of social exclusion and young people from marginalized communities, including through the implementation of the Youth Guarantee' allocates €194.4m.

This measure is aimed at unemployed youngsters, reduction of youth inactivity rate and support the transition to the labour market. Thus, it indirectly creates conditions to deliver target achieving certain level of employment in the age group 20-64, especially in the age sub-group 20-29. There are two expected indicators CR01 Unemployed participants who complete the YEI supported intervention, and output indicator O0085: Persons below 29 years of age. Projected value of output indicator is sufficiently high (54460), so range of methodological approaches such as statistical methods, linear regression, questionnaire survey and field research may to be used.

The possibility of using several methods allows to results triangulation. Given the potentially large number of participants, regional comparison or counterfactual analyses may to be carry out. The main data sources are ITMS2014+, monitoring reports as well as the contextual economic, social, demographic, and administrative data at national or regional level that are provided by the Statistical Office of the Slovak Republic, Slovak Centre of Scientific and Technical Information, Ministry of Education, Science, Research and Sport of the Slovak Republic as well as Central Office of Labour, Social Affairs and Family, and participants outside the public sector.

Investment priorities 3.1 OPHR 'Access to employment for job-seekers and inactive people, including the long-term unemployed and people far from the labour market, also through local employment initiatives and support for labour mobility' allocates €694,4m.

The contemplated combination of indicators are as follows CR04: Participants in employment, including self-employment, upon leaving, and R0089: Participants that successfully completed education/professional training reaches the target value (61,587). Sufficiently high number of observations allows use variety of methods (or its combinations) such as statistical methods, linear regression, questionnaire survey and field research. The possibility of using several methods allows to results triangulation. Given the potentially large number of participants, regional comparison or counterfactual analyses may to be carry out. The main data sources are ITMS2014+, monitoring reports as well as the contextual economic, social, demographic, and administrative data at national or regional level that are provided by the Statistical Office of the Slovak Republic, Slovak Centre of Scientific and Technical Information, Ministry of Education, Science,

Research and Sport of the Slovak Republic as well as Central Office of Labour, Social Affairs and Family or Atlas of Roma communities.

Investment priorities 3.2 OPHR Equality between men and women in all areas, including in access to employment, career progression, reconciliation of work and private life and promotion of equal pay for equal work allocates €66.5m.

The measure aims to reconcile work and family life and the reduction of horizontal and vertical gender segregation in the labour market. Proposed indicators are as follows: output indicator O0087: Number of supported facilities, and R0092: Number of employers/institutions performing measures to align work and family lives six months after completion of project.

Given the low number of organizations supported (50 + 82), methods of qualitative research are recommended (focus groups, depth interviews or case studies). Quantitative methods (including the counterfactual analysis) allows the use of result indicator R0094: Number of parents who received child care benefits and who are employed, or self-employed, six months after the departure, in which the target value (10 553 + 5198) creating a sufficient number of respondents. Contextual economic, social, demographic, gender and administrative data at national or regional level that are provided by the Statistical Office of the Slovak Republic, Slovak Centre of Scientific and Technical Information, Ministry of Education, Science, Research and Sport of the Slovak Republic as well as Central Office of Labour, Social Affairs and Family or participants outside the public sector.

Investment priority 3.3 OPHR 'Modernisation of labour market institutions such as public and private employment services and improving of the matching labour market needs, including through actions that enhance transnational labour mobility, as well as through mobility schemes and better cooperation between institutions and relevant stakeholders' allocates €35m.

The specific objective is to increase the quality and capacity of public services and increase the participation of partners and private employment services to solve problems in the field of employment. Monitored indicators are as following R0097: Number of employees of labour market institutions that completed education focused at the improvement of their skills to provide individualized services to clients, and O0091: Number of participating employees of labour market institutions. Due to the implementation soft activities, implementation of qualitative evaluation methods, such as in-depth semi-structured interviews are recommended.

Investment priority 4.1 OPHR 'Active inclusion, including with a view to promoting equal opportunities and active participation, and improving employability' allocates €152.5m.

The specific objectives are to increase the participation of the most disadvantaged and endangered people in society, including the labour market and to prevent and eliminate all forms of discrimination. This priority contributes to the achievement of the second objective of inclusive growth - a reduction of population at risk of poverty and exclusion from society. Monitored indicators are R0098: Inactive young people aged up to 29, engaged in job searching, education/training, gaining a qualification, in employment, including self-employment, upon leaving, and O0094: Inactive young people up to 29 year. Target number of beneficiaries (indicator R0098) is high enough (1030 + 156),

therefore in addition to qualitative methods (field research) also quantitative ones (regression, statistical methods, counterfactual analysis) may to be used. Contextual of economic, social, demographic, gender and national administrative data at national or regional level, the Statistical Office of the Slovak Republic, Slovak Centre of Scientific and Technical Information are provided by the Statistical Office of the Slovak Republic, Slovak Centre of Scientific and Technical Information, Ministry of Education, Science, Research and Sport of the Slovak Republic as well as Central Office of Labour, Social Affairs and Family, Social Insurance, potential employers, or participants outside the public sector.

Investment priority 6.2 OPHR 'Support for social enterprises allocates €15,1m. Its specific objective is to increase the employment rate of marginalized Roma communities in the social economy entities in areas with the presence of marginalized Roma communities'.

The suggested indicators are following: R0148 Unemployment rate of Roma population in Roma concentrations aged 15 – 64 years, and CO08 Employment increase in supported enterprises. Given the supported enterprises (100) as well as increasing employment in these companies (500) appropriate qualitative evaluation methods are mainly suitable for assessment. Contextual of economic, social, demographic data at national or regional level are provided by the Statistical Office of the Slovak Republic, Central Office of Labour, Social Affairs and Family, Social Insurance or the Atlas of Roma communities.

Integrated Regional Operational Programme is investing in fulfilment of the national target employment growth €611m:
Investment priority 1.1 IROP 'Enhancing regional mobility through connecting secondary and tertiary nodes to TEN-T infrastructure, including multimodal nodes' allocates €298m.

Better roads of II. and III. category are crucial preconditions for improving the circular mobility of people in rural areas relates to growing diversification of economies into non-agricultural activities result in employment growth[20]. Indicators used are following: C013 Total length of new roads, and R0113 Time saving in road transport C014 Total length of reconstructed or upgraded roads. It is not possible to assess influence of supported activities on the national targets of Europe 2020 related to the employment growth. Additionally, advanced econometric modeling could not be used. The impact on employment can be evaluated indirectly using by the case studies. As sources of data ITMS2014+ and database of Statistical Office could be used.

Investment priority2.2 IROP 'Investing in education, training and vocational training, skills and lifelong learning by developing education and training infrastructure' allocates €158m. The investment is focused on infrastructure upgrading (building/reconstruction of specialized classrooms, laboratories supporting polytechnic education, orientation of students on engineering and science, language teaching, ICT labs for the development of information and communication skills of primary school pupils).

The expected results of the support should be soft outcomes such as strengthening of vocational education and training system as well as increase its attractiveness in the

[20] Source: Integrated Regional Operational Programme, p. 37.

context of lifelong learning or improving conditions for employing graduates of vocational education and training to labour market needs. Proposed indicators are R0166 Share of pupils with vocational training and continuous practice in SVS, on the total number of pupils in SVS, O0147 Number of supported Centres of vocational education and training, R0097 Success in Testing 9 language learnt, and O0227 Number of supported primary schools. Qualitative methods may to be used. As respondent's teachers and other staff, participating public authorities, potential employers, self-governing regions could also participated. As data sources ITMS2014+ as well as database SOSR can be used.

Investment priority 3.1 IROP 'Supporting employment-friendly growth through the development of endogenous potential as part of a territorial strategy for specific areas, including the conversion of declining industrial regions and enhancement of accessibility to, and development of, specific natural and cultural resources' allocates €215.7m.

The specific objective is to stimulate sustainable employment and support job creation in the cultural and creative industries. Proposed indicators are R0160 Total number of jobs created in the cultural and creative industry, and CO08 Employment increase in supported enterprises. The target value (1260 + 40) allows for using combination of qualitative and quantitative methods (statistical method, field research, questionnaire). Moreover, cultural and creative industries may to be evaluated using by case studies. Contextual primary economic, social, demographic data at national or regional data are provided by the Statistical Office of the Slovak Republic, Central Office of Labour, Social Affairs and Family, Social Insurance or participants outside public sector, Ministry of Culture of the Slovak Republic as well as municipalities.

The Operational Programme Integrated Infrastructure allocate overall funding of €1,627.3m in the following priority axis:

- ***Priority axis 2 (Road infrastructure (TEN-T CORE) Investment priority 7i) POII*** Support to multimodal single European space via investment to the TEN-T allocates €1,142.5m to construction of new highways and expressways
- ***Priority axis 6 Road infrastructure (outside TEN-T CORE) 7a)*** Support to multimodal single European space via investment to the TEN-T allocates €175.4m to selected expressways.
- ***Priority axis 6 Road infrastructure (outside TEN-T CORE) 7b)*** Enhancing regional mobility via connection secondary and tertiary nodes with the TEN-T infrastructure allocates €309.3m to improvement of first category of the state roads. The specific objective is to improve the security and availability of road infrastructure TEN-T and regional mobility through construction and modernization of first category roads.

One of the expected results of these investments are enhanced conditions for increasing regional competitiveness, population mobility improvement as well as increase potential to employment growth. A direct impact on the employment growth is expected in the primary construction sector. To quantify impact, HERMIN structural model could be applied that determine the direct impact of intervention or CGE modelling. As sources of data is ITMS2014+ database under the Statistical Office of the Slovak Republic.

Given that it is a large one-off investments concentrated in limited number of regions, as complementary evaluation method case studies can be used (alternatively CBA and/or

SWOT analysis of the local/regional labour market). Because due to intervention also other indirect impacts are expected (such as reduction of noise, CO_2, NO_2 and PM10) indirect synergy with sustainable growth will be reached. The primary source of data for econometric modelling systems are ITMS2014+ and Statistical Office data. The sources of quantitative and qualitative data for the case studies are participants implemented transport projects (government agencies, public administration bodies, local governments, private sector, employers, etc.). Contextual as well as primarily economic, social, demographic and administrative data at national or regional level are provided by the Statistical Office of the Slovak Republic, Ministry of Transport, Construction and Regional Development, as well as transport research institutes.

On a small scale, the national goal of employment growth is also supported by **Rural Development Programme**. Priority P6 'Promoting social inclusion, poverty reduction and economic development in rural areas' allocates €78m on rural employment through facilitating diversification, creation and development of small enterprises and job creation.

Investments are supporting tourism and agro-tourism through support of farms and non-agricultural micro and small enterprises. Depending on the number of supported agricultural and non-agricultural business, the number of newly established companies and new jobs supported, combination of quantitative and (mainly) qualitative methods (field research, questionnaire survey, in-depth interviews) and case studies may to be used. The contextual economic, social, demographic, and administrative data at national or regional level are provided by the Statistical Office of the Slovak Republic, Social Insurance Agency in Slovakia and Central Office of Labour, Social Affairs and Family.

4.3.2 Target ‚decreasing share of people in risk of poverty and social exclusion to 17.2% by 2020 (from 20.5% in 2012)'.

Socio-economic context of evaluations

The first step in the analysis is to define the population at risk of poverty and social exclusion. According to statistical surveys and qualitative analyses the most vulnerable groups are unemployed young people (aged 0-17), single-parent families and families with several children, people with disabilities and those employed but with low education levels. Other identified groups are the homeless, drug addicts and other addicts, threatened, respectively abused children, victims of trafficking and chronically ill patients. Specific groups of people in strong risk of poverty and social exclusion are members of the Roma ethnic minority, especially for marginalized Roma communities (MRC).

Reducing the share of population at risk of poverty and social exclusion is a complex objective, which is the sum, result and multiplier of a wide range of measures implemented. These may include anything from measures of financial support to individuals and families that targets to improve their access to the labour market through measures to promote education and housing, as well as support and care services for children and active participation in social life.

The main strategy is to promote social inclusion, which would lead to increased participation of the most disadvantaged and vulnerable people in the society. For this purpose, we need to prevent and eliminate all forms of discrimination, improving access to affordable, sustainable and high-quality services (including health care and social services of general interest) and in particular to support the transition from institutional to community-based care.

How to quantify poverty is rather a complicated issue and the reality of poverty cannot be measured directly. What we analyse is the concept of poverty, based on some certain limits, which have been set and are therefore subject of ongoing discussion bringing together different views. In other words, it is all about finding consensus where is the threshold above which we consider man to be poor.

The basic approach is to define the absolute and a relative poverty. Absolute poverty presumes the existence of a minimum living standard package. This is the approach used mainly in the developing countries where the baseline is to quantify how much is needed to meet basic human needs such as food, shelter or clothing. In the broader context of biological and cultural functions necessary for survival, as the World Bank estimates, this boundaries are at a level of $ 2 per day per person for the poor, while less than 1.25 US dollar per day per person is defined as 'deep poverty'. This approach to definition of poverty is usually not used in developed countries, i.e., Slovakia, although in social reality of MRC, we see a situation where part of the population actually meets this definition of absolute poverty designed for developing countries (Filčák 2012).

Approaches to measuring poverty in Slovakia are based on the assumption that poverty cannot be objectively measured, but can be analysed with respect to the specific context. Poverty is therefore what people in a given society considered as poverty (i.e., socially constructed). Poverty is not a function of biological needs, but mater of a standard definition and what are significant deviation from this standard. On this basis, there are four main approaches to measuring poverty:

- Income: Evaluating average income, median income and income differences within the 10 income deciles.
- Minimum standards: the number of people below the subsistence minimum and a defined number of people receiving social support,
- Consumption and expenditures: consumption basket, the ratio of the cost of basic needs such as food or energy,
- Relative: subjective perception of poverty by a respondent.

The issue, closely related with the poverty, is social exclusion. It is concept used particularly where the social or ethnic group finds himself on the margins of society. This brings limits for the group in access to resources and effective participation in the society. Social exclusion is the result of social and/or ethnic factors. Often, as is the case with the Roma ethnic minority, it is a combination of both.

Material deprivation, low education, problematic housing and environment tend to exclude people from the community and social activities. Families at risk of poverty do

not send children for school trips, are not part of the local societies and live on the margins of society.

In practice, the approach to social exclusion applies four main approaches:

- ***Redistribution***: analysing social impacts and focuses on people living in poverty.
- ***Ethical approach:*** emphasizing criminal behaviour and moral decay of certain social groups that are socially excluded.
- ***Anti-discrimination approach***: focus on the breakdown of racial discrimination, leading to segregation in education and/or the labour market.
- ***Integrative approach:*** social exclusion is given the same level as the exclusion from the labour market, both of which are closely related.

The key problem of social exclusion is that it inevitably leads to long-term unemployment and builds structural barriers to creating measures to improve education, health and active participation in society.

Selected methods for identifying synergy effect in the ESIF

The main approach is, in the context of this objective, to build on quantitative analysis. It means working with the available statistical data operating with three main indicators (risk of poverty, material deprivation rate ,and the rate of low work intensity). In assessing extend, to what the measures implemented contributed to a reduction in aggregated indicators of the number of people at risk of poverty or social exclusion, it is necessary to analyse the situation in the context of overall economic development and social policy measures.

The number of people at risk of poverty or social exclusion can be influenced from the bottom-up (through targeted measures to improve their position) as well as through enhancing economic growth, opening access to jobs and through redistribution of profits. Evaluation at local or regional level must be done by the evolution of local indicators in the context of national or regional social and economic indicators. In theory, there should be a correlation between economic growth and decline in people at risk of poverty or social exclusion. If it is not so, or it is low, it means that the measures implemented face structural barriers, and we may assume problems such is a lack of redistribution of resources, inefficient public policies, or a strong degree of social exclusion of citizens (in our case mainly the Roma).

The specific conditions of Slovakia, which are also reflected in research methods are twofold, is relatively small degree of spatial exclusion of the poor and the problems of marginalized Roma communities. While other target groups in the population ara mostly living in mixed communities, marginalized Roma communities are often clearly spatially defined.

Quantitative analysis can also be used to identify how were the intervention successful in focus on the identified target audience and what the results were in the context of the most vulnerable groups (Table 5). Here one can use sample surveys.

In identifying the impact of interventions that focus on a particular place or community, it is possible to use a combination of quantitative and qualitative approaches. Comparative

analysis can focus on the people who were directly subject of the intervention and compare the data to the surrounding population, which did not directly benefit from the interventions. This method is suitable, for example, when evaluating interventions for marginalized Roma communities and helps to analyse, to what expend we see as impacts on social inclusion.

One of the recommended methods for the analysis of measures to combat poverty and social inclusion is the counterfactual analysis. Applying this approach we try to compare marginalized communities, which were the subject of interventions, and those which were not. Potential for future analysis may be also seen in comparison of the available quantitative data and with data that have been collected by the Atlas of Roma communities. This would require updating of the Atlas on a regular basis, and adjust type and extent of data collection to the requirements imposed by assessment of the impact of cohesion policy.

An important part of the risk of poverty or social exclusion research are qualitative analysis. While quantitative indicators show trends towards objectives at national level, or alternatively, they may provide information at the level of a region or a particular community, they cannot provide full information on why/how certain measures work. In addition, we need to understand, what are the deeper structural barriers for achieving better results. Good choice is to include case studies, where the impact of the interventions is evaluated by using the methods of qualitative research on selected sites. It is possible through observation, focus groups and in-depth interviews, to identify factors that affect the results of interventions. Good use of qualitative methods requires clearly identify goals, to choose adequate sample sites and identify proper respondents. What is important is understanding the context (using quantitative methods), and triangulation and validation of the data collected.

Allocations to investment priorities and evaluation methods

To reduce the risk of poverty or social exclusion is in the current programming period 2014-2020 addressed through the three operational programmes:

- The Operational Programme Human Resources, Investment Priority 4.2 'Enhancing access to affordable, sustainable and high-quality services, including health care and social services of general interest'; 5.1 'Socio - economic integration of marginalized communities, drought and the Roma'; and 6.1 'Providing support for physical, economic and social regeneration of deprived communities in urban and rural areas'
- The Integrated Regional Operational Programme, Investment Priority 5.1 'Undertaking investments in the context of community- led local development strategy'
- The Operational Programme Research and Innovation, Investment Priority 3.1 'Promoting entrepreneurship, in particular by Facilitating the economic exploitation of new ideas and fostering the creation of new firms, including through business incubators.'

The total amount of allocations (including proportional technical assistance) for this purpose and in the four investment priorities is set at €401.33m. For the individual investment priorities, the following evaluation methods may be suggested:

Investment Priority 4.2 OPHR: 'Enhancing access to affordable, sustainable and high-quality services, including health care and social services of general interest'. In terms of investments it is the most important measure. As much as €142.48m and 151 supported projects are planned for this investment priority. It is the largest contribution to the targets of the risk of poverty and social exclusion. Health and social services are essential for improving social inclusion. For many people at risk of poverty and social exclusion it is difficult to access these, which reduce their opportunities for social inclusion.
Output indicator here is O0098: Number of supported capacities of new, innovative services or actions at the community level, at home, in the open environment or in temporary area. The number of persons to whom these services / performed actions in the community / at home / in the open environment are provided should by 2023 in less developed regions rise from 8,257 to 10,063, while in more developed regions from 1209 to 1437. The number of new and innovative clinical practices established in the health system should from zero increase to 100 and the number of new and innovative methods for prevention incorporated to the system should increase from 0 to 4.
Key is the number of projects targeting public administrations or social services (at national, regional and local level) which is planned at the value of 165, and the number of projects for public administration and social services, where the number of projects should reach 6 (151 + 6, output indicator CO22).
Results and impacts of projects focused on public administration and social services can be examined through a questionnaire survey combined with qualitative research on a defined sample of projects. Projects focusing on public administration (or social services) will probably represent a very wide range of approaches and optimum would be to first map them all using the method of Rapid Appraisal and then generate sample for optimal case studies.

Investment Priority 5.1 OPHR: 'Socio - economic integration of marginalized communities, such as the Roma.' In total €99m is planned for this investment priority. The main approaches are increasing the level of education of MRC at all levels of education, focusing on pre-primary education, reducing the unemployment rate of Roma men and women (4.1.2.), as well as the promotion of access to health care and public health, including preventive healthcare, health education and the improvement of standards hygiene in housing.
Performance indicator is R0106: Participants of MRC, which gained upper secondary (ISCED 3) or post-secondary (ISCED 4) education and the output indicator is O010: Number of employees in the educational process and in the provision of social services. The number of participants from the MRC, who gained upper secondary (ISCED 3) or post-secondary (ISCED 4) should grow from 164 to 266. Inactive participants from MRC, who at the time of leaving from the programs and are involved in the job search should reach 3353, while the number of Roma who are employed in health and educational promotion, prevention and counselling should increase from 16 to 76. The number of

persons from the MRC, who may reach improved living standards of hygiene due to the land property rights settlement program is expected to reach 6398 people.
For the evaluation of the benefits from these different approaches it is suggested to combine aggregated analysis of output indicators from individual projects with a questionnaire survey. In addition to the quantitative assessment of the achievement of objectives (research of project beneficiaries), it is necessary to combine approach with qualitative assessment methods, focused primarily on the results achieved in the employment of members of the Roma ethnic minority, as well as on the achievements of the land property rights settlement program. There are fairly strong barriers at the local level, which need to be addressed for the achievement of the set objectives and the planned numbers. The socio-economic context plays a strong role.

Investment Priority 6.1 OPHR: 'Providing support for physical, economic and social regeneration of deprived communities in urban and rural areas' will invest €30.8m. It is intervention area 055 - 'Other social infrastructures which contribute to regional and local development.'
It deals with building community centres, which are connected to the allocation made through the IP 1.5 As the indicators one may use combination od: R0147 Number of MRC members, who six months after the project termination used the services of community centres - O0196 number of new social infrastructures facilities /O0198 - Number of renovated facilities of social infrastructure.
For evaluation of the benefits it may be appropriate to combine aggregated analysis of output indicators from individual projects with a questionnaire survey. In addition to the quantitative assessment of the achievement of objectives (research of project beneficiaries) it is necessary to include qualitative assessment methods.

Investment Priority 5.1 IROP: 'Undertaking investments in the context of community-led local development strategies", where €100m is planned for this investment priority. Here we deal with a community-led local development based on the functioning of local public-private partnerships, possibly institutionalized in the form of local action groups.
Performance indicator is R0168: The share of employment in micro and small enterprises with up to 49 employees and self-employed persons in the total number of employment in micro and small enterprises with up to 49 employees and self-employed persons in the sectors falling outside support for the Rural Development Programme 2014-2020, while output is CO008: Employment in supported businesses. In this area it means mainly financing of operational and animation costs associated with the management and implementation of local development strategies led by a community.
The main approach to the evaluation should be in deploying qualitative methods on samples of such strategies, while it is possible to develop a number of case studies that focus on the positive and negative factors in the implementation, and on the quality of the results achieved. Given the large number of enterprises supported (373, output indicator CO01), it would be appropriate to used also quantitative methods, namely (a) exploration of project beneficiaries and (b) the counterfactual analysis of indicators of employment in supported versus unsupported enterprises and based on the method of difference-in- Difference (DID).

Investment Priority 3.1 OP R&D: 'Promoting entrepreneurship, in particular by facilitating the economic exploitation of new ideas and fostering the creation of new firms,

including through business incubators.'. It is supporting activity aimed at social inclusion through promoting entrepreneurship, with the total allocation of €5.6m.
The output indicator is O0078: Number of new SMEs established by people from disadvantaged social groups (370 enterprises) and result R0048: The survival rate of new businesses in the market after two years. Given the large number of supported firms, we may use here quantitative methods, namely (a) exploration project beneficiaries and (b) the counterfactual analysis of indicators of employment in supported versus unsupported enterprises based on the method of difference-in-difference (DID).
Quantitative data on the socio - economic context of the business environment and the quantification of SMEs number and the survival rate could be complemented by qualitative research, focusing on the factors that may reduce the creation of new businesses, job creation and the factors that influenced the survival rate .

4.4 Data resources and availability

Indicators for the analysis of the objective 'average employment rate in the age group 20-64 years 72% by 2020 '
Within the Partnership Agreement (2014 - 2020), there are basically two approaches leading to the fulfilment of the national target of employment rate in the age group 20-64 years 72% in 2020:

1) investment in human capital (support of a broad spectrum of forms of education of selected population groups, improving labour market functioning and active labour market policies) through the investment priorities of the OPHR and partly IROP. An essential source of data are ITMS2014 + and monitoring reports. Context of economic, social, demographic and administrative data at national resp. regional level are provided by the Statistical Office of the Slovak Republic, Slovak Centre of Scientific and Technical Information. Ministry of Education SR, Central Office of Labour, Social Affairs and Family (COLSAF), Atlas of Roma Communities, as well as those from Social Insurance and municipalities. As the secondary source, we may use respondents providing complementary information or knowledge. It can be project participants: teachers, parents, students, potential employers, government, employees of state / public administration, non-profit sector participants. Character and 'diversity' (heterogeneity and variability) of beneficiaries / target groups as well as indicators of outputs may provide sufficient sources of quantitative and qualitative data.
2) investment in transport infrastructure (motorway and road network) through selected investment priorities OPII and partly IROP. Job creation is foreseen in the implementation of projects of construction / reconstruction of road infrastructure. Yet the OPII output indicators do not provide sufficient information for direct quantification of number of new jobs and their sustainability during and after the implementation of the project.

Missing data can be obtained in the following ways:

a) report, at the project basis, number of jobs created (and their duration) at the level of suppliers and subcontractors (Tiers 2-4) or at the level of firms involved

in the projects undertaken. In cooperation with Central Office of Labour, Social Affairs and Family one can detect whether there is an employment generated for risk groups of unemployed (long-term unemployed, young, MRC).

b) the impact of new transport infrastructure on employment growth after implementing the project may be measured ex post based on case studies. Such a monitoring may work with number of jobs in the region before and after the project (structure of the job may be also examined). The primary data source is the Statistical Office of the Slovak Republic or Central Office of Labour, Social Affairs and Family. Additionally, sample surveys may be used.

c) in the case of using econometric methods at the regional level, it is necessary to use more detailed data at NUTS III (regional prices and trade flows between regions) or NUTS IV.

Indicators for analysis of the target to 'reduce the proportion of the population at risk of poverty and social exclusion to 17.2% by 2020"

The share of population at risk of poverty and social exclusion was in 2012 on the level of 20.5%. By 2020 it should, according to the targets of the Europe 2020 fall to 17.2%. Detail description and analysis of this indicator is explained by the Eurostat website.[21] In the Slovak language, we may find its description in the publications of the Statistical Office (Vlačuha and Škápik, P. 2012))[22], where it is described and shows how to define the aggregate indicator of poverty or social exclusion based on a multidimensional approach to measuring poverty. Unlike one dimensional indicators reflects the risk of poverty and social exclusion also two others: material deprivation and exclusion from the labour market.

The aim is to complete view using three key sub-indicators:

- ***The risk of poverty:*** at-risk-of poverty in the EU is determined to be 60% of the national median equivalent disposable income. The indicator shows the risk of poverty after social transfers and the proportion of people whose equivalent disposable income is below the poverty line.
- ***Material deprivation rate:*** Indicates the percentage of the population who suffer from an enforced lack of at least four (out of nine) deprivation items.
- ***The rate of low work intensity:*** Share of people living in households with very low work intensity (less than 20%) and in proportion to the total population of the country

As illustrated in Table 5, the most vulnerable groups in Slovakia are, in the population at risk of poverty and social exclusion, children, followed by adults and older people. Statistical Office (Vlačuha and Škápik, P. 2012) on the basis of EU-SILC 2011 indicates that number of people in Slovakia who were at risk of poverty or social exclusion is 1112200, representing 20.6% of the total population. The share of population at risk of poverty and social exclusion in the following year 2012 reached 20.5%. This was the year and data taken as the basis for target setting. According to EU-SILC, this

[21] http://ec.europa.eu/eurostat/statistics-explained/index.php/People_at_risk_of_poverty_or_social_exclusion

[22] Vlačuha, R. a Škápik, P. 2012. EU SILC 201: Ukazovatele chudoby a sociálneho vylúčenia. Bratislava: Štatistický úrad Slovenskej republiky.

percentage dropped in 2013 to 19.8%, while in 2014 it went down to 18.4%. It suggests, that the Slovak Republic is on the positive trajectory and has a real chance of achieving the 2020 target set to be on the value of 17.2%. It would be necessary to maintain at least the current levels of economic growth and at least partially overcome structural barriers that keep part of the population in poverty and social exclusion. The Roma ethnic minority is identified as a priority in this regard.

Table 5: Share of population at the risk of poverty (% of specific population)

Country	Total	Children(0–17)	Adult (18–64)	Elderly (65 and more)
EU-28	**24.4**	**27.8**	**25.4**	**17.8**
EA-18	**23.5**	**25.6**	**25.1**	**16.0**
Belgium	21.2	23.2	21.6	17.3
Bulgaria	40.1	45.2	36.4	47.8
Czech Republic	14.8	19.5	14.6	10.7
Denmark	17.9	14.5	21.3	10.8
Germany	20.6	19.6	22.0	17.4
Estonia	26.0	23.8	24.0	35.0
Ireland	27.4	30.3	29.2	13.0
Greece	36.0	36.7	40.1	23.0
Spain	29.2	35.8	31.8	12.9
France	18.5	21.6	19.9	10.1
Croatia	29.3	29.0	29.3	29.7
Italy	28.3	32.1	30.0	20.2
cypress	27.4	24.7	28.3	27.2
Lithuania	32.7	35.3	30.0	39.3
Latvia	27.3	28.9	25.6	31.9
Luxembourg	19.0	26.4	19.4	6.4
Hungary	31.1	41.4	31.5	18.1
Malta	23.8	31.3	21.8	23.3
Netherlands	16.5	17.1	18.9	6.9
Austria	19.2	23.3	18.9	15.7
Poland	24.7	28.2	25.2	18.2
Portugal	27.5	31.4	28.3	21.1
Romania	40.2	51.0	38.7	34.0
Slovenia	20.4	17.7	21.3	20.1
Slovakia	18.4	23.6	18.1	13.4
Finland	17.3	15.6	17.9	17.0
Sweden	16.9	16.7	17.2	16.5
Great Britain	24.1	31.3	23.2	19.3

Source: Eurostat (online data code: ilc_peps01)

There are data available at the Statistical Office and the EU SILC for the three sub-indicators (risk of poverty, material deprivation rate, and the rate of low work intensity. As pointed above, there is specific group of the Roma ethnic minority and marginalized Roma communities where a substantial part of the measures in the programming period 2014-2020 is earmarked. Social policy measures here impinge on the availability of data,

as the data that has been collected in the Slovak Republic, are not categorized by nationality and ethnicity. On the other hand, targeted measures on social inclusion requires more precise mapping of the target groups. For this reason, in 2004 and 2013 the so-called Atlas of Roma Communities was developed. The latest version is from 2013 and it provides detailed information for the support of inclusive policies (Box 9).

Box 9 The Roma Communities Atlas 2013

Project Atlas of Roma Communities implemented in 2013 the United Nations Development Programme (UNDP) in collaboration with the Institute of Roma Studies at University of Presov, the Office of the Plenipotentiary for Roma Communities and the Association of Towns and Municipalities. The project was part of a joint program of UNDP and the Ministry of Labour, Social Affairs and Family, designed to monitor the living conditions of the Roma population.

Based on the original methodology developed in 2004 as applied method of sociographic territorial mapping of Roma settlements, the Atlas identified four types of the Roma settlements (vis-à-vis spatial relations to majority population). It is (i) Scattered - Roma living in the village mixed with the majority; (ii) Concentrated in the village - Roma living in the community but concentrated in a part or parts; (iii) Concentrated on the outskirts of the village - Roma living in concentrations in the outskirts of the village; and (iv) Concentrated outside the village - Roma living in the village far from the village or separated from the village by a barrier. Atlas of Roma Communities 2013 is not a census of the Roma population, but relies on estimates numbers based on the perception of people in a particular town or city who is/who is not Roma.

The highest number of villages and towns with the Roma community is located in the Banská Bystrica region (266 municipalities, which is 24.9% of all municipalities included in the Atlas) and the least concentration is in the Bratislava and Žilina region (27 municipalities, which is only 2.5% of all municipalities included in Atlas). The highest percentage of municipalities with Roma community has Košice Region (58.2%) and the smallest percentage of municipalities with Roma community has Zilina (8.6%). Out of the 138 cities in Slovakia, Atlas found only 18 towns with no register relevant Roma community. These cities: Svaty Jur (BA); Sliač (BB); Dudince (BB); High Tatras (PO); Nová Dubnica (TN); Nemšová (TN); Ilava (TN); Bojnice (TN); Willow (TT); LEOPOLD (TT); Bytča (A); Tvrdošín (A); Námestovo (A); Trstená (A); Krasno nad Kysucou (A); Turčianske Teplice (A); Rajec (A); Rajecké Teplice (ZA).

Atlas provides detailed data and statistics on the living conditions of Roma and is the basis for public administration, non-profit and private sector in setting up targeted public policies and programs aimed at improving living conditions and social inclusion of Roma.

Complete information about the Atlas of Roma communities are on the website of the Ministry of Labour, Social Affairs and Family.

The Gap Analysis of what data are available and what would be needed to be supplemented indicates relatively good sources of data available from the EU SILC and the Statistical Office of the Slovak republic. The three basic indicators of risk of poverty, material deprivation, and low work intensity rate can effectively followed, tracked and analysed at the level of the Slovak republic and provide data for monitoring of aggregate indicator of the risk of poverty and social exclusion. For the needs assessment of the

impact of cohesion policy it would be important systematically track what is the contribution of the measures for the identified target groups. As Table 5 indicates, in the case of Slovakia it is mainly group of children (0-17). The second aspect is the issue of the MRC, where good data quality is supplied by the existing Atlas of Roma Communities. Yet for the assessment of the impact of interventions it would be necessary to update the atlas in regular cycles, while coordinate its questionnaire and scope of collected data as much as possible with the needs assessment of partnership agreement.

4.5 The Inclusive Growth: allocations to main targets and synergies

The total volume of allocations from European funds to areas of intervention aimed at inclusive growth for the programming period 2014 - 2020 is €4,663.m,[23] whereby:

- to the national target 'Increasing the employment rate of people aged 20-64 years to a level of 72% by 2020' allocation is €3,655.81m (or 78.4% of the EU funds for inclusive growth).
- to the national target of 'Reduction of population at risk of poverty and exclusion from society by 170,000 people by 2020,' it is €386.8m allocated (or 8.28% of EU funds inclusive growth).
- For areas not included in any of the national targets, but supporting activities that pursue inclusive growth it is allocated €621.3m (or 13.32% of the EU funds inclusive growth).

As for the programmes earmarked for inclusive growth, we have identified following three operational programs: Operational Programme Human Resources, Operational Programme Integrated Infrastructure, and Integrated Regional Operational Programme.

- In the framework of the inclusive growth there is €1,310.3m in OPHR invested primarily into the national objective 'Increasing the employment rate of the population aged 20-64 years to a level of 72% by 2020'. The area of intervention with the highest investment is represented by the code 102 ('Access of job seekers and inactive people to employment, including long-term unemployed and people who are distant from the labour market, including local employment initiatives and support for labour mobility) with the total of €694.4m. On youth unemployment is focused the second highest investment - Code 103 (sustainable inclusion of young people, especially those not in employment, education or training, including young people at risk of social exclusion or young people from marginalized communities to the labour market, including guarantees for the young), where €194.4m is benchmarked. Effects of interventions can be measured by a combination of output and outcome indicators: 'Unemployed participants who complete the intervention supported by the funds allocated to the initiative to promote the employment of young people - under the age of 29

[23] Source: Financial plans of the operational programmes. The sums involve proportional part of the technical assistance.

years' or 'Participants who are in employment upon leaving, including those self-employed - Participants who have successfully completed education / training."

- In the context of inclusive growth, the OPHR focuses national target 'Reduction of population at risk of poverty and exclusion from society by 170,000 people by 2020' identified in the areas of intervention, 110, 112 - 'socio-economic integration of marginalized communities such as the Roma'; and 'Improving access to affordable, sustainable and high quality services, including health care and social services of general interest,' both supported by of €273m. Effects of interventions can be measured by a combination of output and outcome indicators: 'Participants from the MRC, who gained upper secondary (ISCED 3) or post-secondary (ISCED 4) education - The number of employees in the educational process and in the provision of social services,' or 'The number of supported capacities in building of new, innovative services or actions at the community level, at home, in open environment or temporary areas - Number of projects targeting public administrations or social services at national, regional and local level.' In the thematic areas 055 - Other social infrastructures contributing to regional and local development, allocation is made at the level of 30.8m. The proposed combination of indicators is: R0147 number of people from MRC, who six months after the project terminates use the services of community centres - O0196 number of new social infrastructure facilities / O0198 - Number of renovated facilities of social infrastructure.
- Besides the two aforementioned national targets funded by the OPHR, there are others which lesser in extent, contribute to the overall inclusive growth. These are the areas of intervention 032; 054; 101 with a total investment of 106.5m. Here we find investments in infrastructure aimed at improving the quality of life and inclusion; 032 - 'Local access roads (newly built)"; 054 - 'Infrastructure in housing.' Such investments contribute indirectly to inclusive growth. Effects of interventions can be measured by a combination of output and outcome indicators: 'Number of new social infrastructure facilities - Number of people from MRC, who six months after the project termination use the services of community centres; or 'population using improved housing forms - Number of Roma dwellings with good living conditions'

The Integrated Regional Operational Programme allocated from European funds in all areas of intervention in total €1,692.5m (excluding technical assistance). Of this amount, EUR 1 203.9 mil.is allocated to inclusive growth targets. In the framework of the inclusive growth investing, IROP allocates amount of 611m for the national target of 'Increasing the employment rate of the population aged 20-64 years to a level of 72% by 2020.'

- The largest part of this amount, or €298m, is designated for areas of intervention 031 and 034 ('Other national and regional roads (newly built) and reconstructed or improvement in the quality of other types of roads (motorways, national, regional or local roads). The effect of this intervention can be measured by a combination of indicators:' Overall length of new roads –Time savings in road transport' or CO14 'Total length of reconstructed or renovated roads - saving time in road transport.'

- A smaller amount of €158m has been allocated to education infrastructure (codes 050: Educational infrastructure - vocational training and adult education and 051: Education Infrastructure - school education (primary and general secondary education).
- The employment growth by supporting business infrastructure in selected - creative – industries is supported by allocated €155m (areas of intervention 072: Business infrastructure for SMEs (including industrial parks and areas); 077: Development and promotion of cultural and creative activities in SMEs; and 076: Development and promotion of cultural and creative activities in SMEs.
- To the national target 'Reduction of population at risk of poverty and exclusion from society by 170,000 people by 2020,' there is intended allocation in IROP at the level of €100m and within the area of intervention 097 (initiatives in community-led local development in urban and rural areas).

The effect of the interventions can be measured by a combination of indicators like 'share of employment in micro and small enterprises up to 49 employees and self-employed persons in the total number of employment in micro and small enterprises with up to 49 employees and self-employed persons in the sectors falling outside support for the Rural Development Programme 2014-2020 - Employment in supported businesses.'
Outside the two aforementioned national targets, the IROP finances, although to a lesser extent, activities which contribute to the overall inclusive growth targets with 492.9m. The investments are in:

- 053: Health Infrastructure
- 055: Other social infrastructures which contribute to regional and local development.

The effects can be measured by a combination of indicators 'Share of persons (children with disabilities, people with disabilities, people in unfavourable social situation, the elderly), to whom social services at the community level are provided to the total number of persons who are provided with social services - Capacity of supported facilities of social services' or 'Number of primary contact doctors per one contact point – Number of inhabitants with access to improved health services in the centres of integrated health care.'

Table 6: The map of allocations by the OPHR, IROP, and OPII into targets in the inclusive growth

Inclusive growth	Interventions in inclusive growth outside national targets	Employment rate	Decreasing share of population at the risk of poverty or social exclusion
OPHR 1.2		(118) €97.7m	
OPHR 1.4		(117) €55.1m	
OPHR 2.1		(103) €194.4m	
OPHR 3.1		(102) €694.4m	
OPHR 3.2		(105) €66.5m	
OPHR 3.3		(108) €35m	
OPHR 4.1		(109) €152.2m	
OPHR 4.2			(112) €142.5m
OPHR 5.1			(110) €99m
OPHR 6.1	(032,054,101) €106.5m		(055) 30.8m
OPHR 6.2		(073) €15.1m	
OPHR TA	(121-123) €4.0m	(121-123) €48.4m	(121-123) €10.1m
IROP 1.1		(031,034) €298m	
IROP 2.1	(053,055) €492.9m		
IROP 2.2		(050,051) €158m	
IROP 3.1		(072,076,077) €155m	
IROP 5.1			(097) €100m
IROP TA	(121-123) €18.6m	(121-123) €22,4m	(121-123) €3.67m
OPII PA 2; 7i		(028,044) €1142,5m	
OPII PA 6; 7a		(029,044) €175.42m	
OPII PA 6; 7b		(031,034) €309.33m	
OPII PA 7; 2c		(121-123) €36.49m	
Total	**€621.3m**	**€3 655.8m**	**€386m**

Source: Financial plans by the operational programmes. Notes: (065) €51.2m = the intervention code and allocation in €m.

4.5.1 Synergies with the smart growth

Total synergies between inclusive growth and smart growth are quite significant, reaching amount EUR 1 406.2 million. EUR (including technical assistance; Table 7). The highest share of synergies one finds in OPII - Priority 7 (Information Society) in the amount of €823.7m, identified as the interventions in support of smart growth yet not included in the national targets. These interventions aimed to increase the efficiency of modern ICT and potentially innovate public sector (e-Government, e-Health, etc.). The substitution of labour by new technologies may decrease the demand for labour in the public sector. The growth of the efficiency of public administration through ICT reduces the administrative burden on businesses and increase its competitiveness. Given the complex nature of the area to which interventions under OPII and Priority axis 7 aim, the effect of the interventions could be measured a number of combinations of output and outcome indicators:

- Percentage of population using mobile broadband internet access / Percentage of population using broadband internet regularly - Other households with broadband access with the speeds of at least 30Mbps;

- The percentage of SMEs that sell goods and services online - Number of new SMEs using shared public administration services;
- The overall use of e-Government services by entrepreneurs / Total use of e-Government services by citizens - Number of new simplified life situations for entrepreneurs realized through the combination of e-services / Number of new simplified life situations for citizens realized by combining electronic services;
- Downloads of open data - additional share of public administration institutions affiliated to a central platform for open data;
- The percentage of individuals with moderate to high computer skills - Increased use of electronic services by disadvantaged groups;
- Percentage of disadvantaged individuals using the Internet - Increased use of electronic services for disadvantaged groups.

The second group of synergies consists from the interventions of the OPHR and IROP, which contribute to the national target of reducing early school leaving. Their amount is €431.7m (including technical assistance). In the framework of the OPHR there are these investment priorities:

- IP 1.1 - Reducing and preventing early school leaving and promoting equal access to good-quality early-childhood, primary and secondary education, including formal, informal and conventional methods of education for the purpose of re-integration into education and training,
- IP 5.1 - Socio-economic integration of marginalized communities aimed at Roma children in pre-school age (allocation of €40m); and
- IP 1.6, which is in the intervention area 050: Infrastructure of education and care for pre-schoolers focused on children from marginalized communities (amount of the intervention is €50.2mo, increasing the capacity of kindergartens).

Effects of the interventions can be measured by a combination of output and outcome indicators: 'gross schooling of children in kindergartens - Number of supported kindergartens'
A slight synergy between the operational programs of inclusive growth and smart growth may be found in the areas such as national targets for increasing the share of population with higher education. For this aim, the OPHR interventions in the amount of 87.7m (including technical assistance) focus on the following investment priorities:

- IP 1.3 Improving the quality, efficiency and access to tertiary and equivalent education. The effect of this intervention can be measured by a combination of output and outcome indicators: Number of graduates supported by professionally oriented bachelor programs - Number of university students.

Table 7: The map of synergies between the inclusive and smart growths by codes of intervention fields

Inclusive	Interventions in smart growth outside national targets	Early school leavers	Population with the tertiary attainment	Share of GERD in GDP
OPHR 1.1		(115) €221.5m		
OPHR 1.3			(116) €84.6m	
OPHR 5.1		(111) €40m		
OPHR 6.1		(052) €50.1m		
OPHR TA		(121-123) €11.5m	(121-123) €3.1m	
OPII PA 7; 2a	(045, 046,048) €277.8m			
OPII PA 7; 2b	(082) €10m			
OPII PA 7; 2c	(078,079,080,081) €517.8m			
OPII TP	(121-123) €18.1m			
IROP 2.2		(052) €105m		
IROP 3.1	(066, 067) €60.9m			
IROP TA	(121-123) €2.2m	(121-123) €3.6m		
Total	**€886.8m**	**€431.7m**	**€87.7m**	**€0m**

Source: Financial plans by the operational programmes. Notes: (065) €51.2m = the intervention code and allocation in €m.

4.5.2 Synergies with the sustainable growth

Significant synergies are found between operational programs for inclusive growth and sustainable growth. HR OP, IROP and OPII all contribute to the objectives of sustainable growth by investing of the amount of €1,858.9m. Dominant position in this regards has OPII which has priority of investment to the national target of reducing CO_2 emissions by investing in rail transport and low-carbon urban transport systems and where the investment totals €1,479m.

The Operational Programme Integrated Infrastructure develops multi-modal transport systems:

Investment Priority7i) 'Support to multimodal single European space via investment to the TEN-T' contains the area of intervention 024 (Railways - core TEN-T network). The priority, among other things, envisages a reduction of delays and operating costs, creation of conditions to increase the share of rail passengers and freight transport and reduce negative impacts on the environment (reduction of noise load and CO_2, NO_2 and PM^{10}. The effect of this synergy can be measured by a combination of common indicators of outcome output: R0053 time savings in rail transport - CO12 Total length of reconstructed or refurbished railway lines in the TEN-T.
Investment Priority7iii) 'Development and modernization of complex interoperable rail systems of high quality and support to the noise-decreasing measures' contains the area

of intervention 027 (Mobile rail assets). The priority will increase interoperability, security and reliability of rail transport. This will help to stop the decline in the share of environmentally friendly rail transport to the overall transport market in which growing importance takes (environmentally less friendly) road transport. The effect of this synergy can be measured by a combination of output and result: R0053 - Time savings in rail transport - R0131 Total volume of international transport on the TEN-T East / Eastern Mediterranean (segment of border CR / SR - Kúty - Bratislava - / R0055 the number of passengers transported in public rail transport.
Investment Priority7ii) 'Development and improvement of the eco-friendly (including low-carbon and low-noise) transport systems, including inland waterways and marine transport, ports, multimodal connections and airport infrastructure, and to support sustainable regional and local transport' contains areas of intervention 026 (Other railways) and 043 (Clean urban transport infrastructure and its support, including equipment and rolling stock). The priority assumes that as a result of intervention, we will see increase in the quality of services and thus the attractiveness of public passenger transport, which will contribute to reducing negative impacts on the environment, particularly noise load and CO_2, NO_2 and PM^{10}. The effect of this synergy can be measured by a combination of output and result: R0058 Number of passengers carried rail public transport in the cities of Bratislava, Košice, Žilina, Prešov and Banská Bystrica - CO15 total length of new or upgraded lines for trams or metro / O0190 number of new rail public transport (trams, trolleys) also suitable for passengers with reduced mobility.
Investment Priority7i) 'Support to multimodal single European space via investment to the TEN-T' contains the area of intervention 041 (Inland waterways and ports TEN-T). The logic of intervention in this priority assumes that as a result of improvement in the quality and safety of services provided in port in Bratislava, and thanks to the improvement of waste and fuel management, we will see increase in the share of water transport and modal split. These interventions will help to reduce the negative impacts on the environment, in particular emissions of CO_2, NO_2 and PM^{10}. The synergy effect can be measured by a combination of output and result: R0060 volume of realized freight transport performed in the public port Bratislava - O0191 number of modernized public ports on the network.
Investment Priority7d) 'Development and modernization of complex interoperable rail systems of high quality and support to the noise-decreasing measures' includes areas of intervention:

- 025: Railways - complex TEN-T network,
- 026: Other railroads.

The logic of intervention in this priority envisages the improvement of the technical parameters of the railway infrastructure in selected sections (outside the TEN-T CORE), increasing the share of electrified lines and increase comfort for end users, reflected in a higher attractiveness of rail transport in the regions. The results is in the reduction of the negative impacts on the environment (reduction of noise load, and CO_2, NO_2 a PM_{10}.). The synergy effect can be measured by a combination of output and result: R0061 Rate of electrification of railways - CO12 Total length of reconstructed or renovated railway lines.
On a small scale there is also contribution of OPHR to the synergy of operational programs, since there is a contribution of €42.8m (including technical assistance, Table 8), aimed at sustainable growth areas not directly affiliated with targets. Here we find

activities in the investment priorities of 6.1, such as the management of household waste, water supply and wastewater treatment in marginalized communities. Effects of interventions can be measured by a combination of output and outcome indicators: population using improved housing forms - Number of Roma dwellings with good living conditions; or an increase in the population with improved water supply - Share of MRC households with access to drinking / potable water.

The IROP contributes to the sustainable growth with the amount of €336.5m. The detailed allocations include:

- To the national target for increasing the energy efficiency, out of this operational program and Investment Priority 4.1(Supporting energy efficiency, smart energy management and renewable energy use in public infrastructure including in public buildings and in the housing sector) allocated amount of €117.5m (including technical assistance). Effects of interventions can be measured by a combination of output and outcome indicators: energy efficiency of residential buildings - Final energy consumption.
- To the reduction of CO_2 emissions contributes IROP through Investment Priority 1.2 (Development and improving environmentally-friendly including low-noise and low-carbon transport systems, including inland waterways and maritime transports, ports, multimodal links and airport infrastructure, in order to promote sustainable regional and local mobility) in the amount of €127.5m. Effects of these interventions can be measured by a combination of output and outcome indicators: Length of new sections of roads cycling - cycling share in the total division of transport work; or the number of sold tickets in the integrated transport systems -Number of established systems; or the number of replaced buses in urban and suburban transport - market share of low-threshold buses in the total number of buses.
- Sustainable growth not included to the targets is out of the IROP supported by the amount of €91.54m. This applies to the investment priorities 4.2 (Investing in the water sector to meet the requirements of the Union's environmental acquis and to address needs, identified by the Member States, for investment that goes beyond those requirements); and 4.3 (Taking actions to improve the urban environment , to revitalize cities, regenerate and decontaminate brownfield sites (including conversion areas), reduce air pollution and promote noise-reduction measures). Effects of these interventions can be measured by a combination of output and outcome indicators:
    - Population connected to the public water supply - Increased population with improved drinking water supply
    - The number of inhabitants connected to the collection and treatment of urban waste water. Increased population with improved urban waste water treatment
    - The proportion of green infrastructure in the total area of cities - Number of completed elements of green infrastructure / created or renewed open spaces in urban areas.

Table 8: The map of synergies between the inclusive and sustainable growths by codes of intervention fields

Inclusive growth	Interventions in sustainable growth outside national targets	Energy efficiency	Decreasing CO2 emissions	Renewable energy resources
OPHR 6.1	(017,020, 022,055) €41.3m			
OPHR TA	(121-123) €1.5m			
OPII PA 1; 7i)			(024) €545.8m	
OPII PA 1; 7iii)			(027) €180.0m	
OPII PA 3; 7ii)			(026, 043) €322.2m	
OPII PA 4; 7i)			(041) €116.5m	
OPII PA 5; 7d			(025, 026) €282.2m	
OPII TA			(121-123) €32.5m	
IROP 1.2			(043,044,090) €123m	
IROP 4.1		(014) €113.4m		
IROP 4.2	(020, 022) €55.0m			
IROP 4.3	(085) €33.3m			
IROP TA	(121-123) €3.24m	(121-123) €4.1m	(121-123) €4.5m	
Total	**€134.3m**	**€117,5m**	**€1 606.7m**	**0**

Source: Financial plans by the operational programmes. Notes: (065) €51.2m = the intervention code and allocation in €m.

5 Sustainable Growth

This chapter firstly defines 'sustainable growth' in chapter 5.1. The three national targets for the sustainable growth, as imposed by Europe 2020, Partnership Agreement and related documents, are described in the chapter 5.2.

The chapter 5.3 presents the quantitative and qualitative methodology approaches to evaluation of the ESIF contribution to the sustainable growth. The achievement of the national targets of the EU2020 Strategy is subject to social, economic and demographic context. The chapter 5.3 analyses impact of the context on the choice of the evaluation methods. The chapter also presents examples of applications of the methods in the past evaluations. The main investment priorities for achieving national targets are listed in the final part of the chapter. The chapter presents investment allocations and key activities of the investment priorities, and combination of the output and result indicators for evaluating contribution of the ESIF to achievement of the national targets.

The chapter 5.4 summarises key data sources, which are needed for evaluating contribution of the ESIF to achievement of the national targets and for evaluating synergies between the growth priorities. The chapter also identifies fields of evaluation with lack of data (Gap Analysis) and suggests procedures for the data generation.

The chapter 5.5 firstly analyses allocations by the operational programmes to the sustainable growth priority. It also lists allocations, which fell under the priority, but are outside the specific national targets. The chapter also lists a table with a map of allocation by the OP QE, RDP and OPF to targets in the sustainable growth. The table lists fields of interventions and amounts of allocations for each investment priority by the abovementioned operational programmes. The subchapters 5.5.1 and 5.5.2 map synergies between the sustainable growth on one hand, and inclusive and smart growths on the other hand. These subchapters also include tables with maps of allocations for specific priorities.

5.1 Definition of the Sustainable Growth

The Sustainable Growth means promoting a more resource efficient, greener and more competitive economy. The EU2020 Strategy defines Sustainable Growth in following way[24]:

'Sustainable growth means building a resource efficient, sustainable and competitive economy, exploiting Europe's leadership in the race to develop new processes and technologies, including green technologies, accelerating the roll out of smart grids using ICTs, exploiting EU-scale networks, and reinforcing the competitive advantages of our businesses, particularly in manufacturing and within our SMEs, as well through assisting consumers to value resource efficiency. Such an approach will help the EU to prosper in a low-carbon, resource constrained world while preventing environmental degradation,

[24] Communication from the Commission, Europe2020 (2010): A strategy for smart, sustainable and inclusive growth, European Commission, Brussels, 3.3.2010 COM(2010) final, p. 14.

biodiversity loss and unsustainable use of resources. It will also underpin economic, social and territorial cohesion'.

The Box 10 summarises seven characteristics of the Sustainable Growth.

Box 10 Definition of the Smart Growth by the European Commission

Sustainable growth means:

- building a more competitive low-carbon economy that makes efficient, sustainable use of resources
- protecting the environment, reducing emissions and preventing biodiversity loss
- capitalising on Europe's leadership in developing new green technologies and production methods
- introducing efficient smart electricity grids
- harnessing EU-scale networks to give our businesses (especially small manufacturing firms) an additional competitive advantage
- improving the business environment, in particular for SMEs

Source: European Commission[25]

5.2 The national targets for the Sustainable Growth

National targets sustainable growth in the Europe 2020 strategy include:

1) Emissions of greenhouse gases, baseline year 2005: decrease by 13 % by 2020 compared to 2005 (in sectors other than emission trading scheme (ETS)).
2) Achieving the 14% share of renewable energy in total gross final energy consumption by 2020.
3) Reduction in final energy consumption by 11% by 2020 (relative to 2001-2005 average).

This relatively narrowly defined goals needs to be understood in the context of the Union's policy where they go through continuous development. In addition to the three basic objectives we thus need to see how much interventions follow longer-term horizon of the EU's policies. From the principles of green growth the European Commission gradually moves on and develops and implements the principles of a low-carbon economy, which is part of the wider context of the so-called. Circulatory Economy. Growth should be based on reducing greenhouse gas emissions and improve the efficiency of management of natural resources. Among six main principle of circular economy are:

[25] See more information: http://ec.europa.eu/europe2020/europe-2020-in-a-nutshell/priorities/sustainable-growth/index_en.htm

1) All materials and are constantly recycled.
2) All energy is produced from renewable or otherwise sustainable sources.
3) human activities support ecosystems a generate new natural capital.
4) The resources are used to value creation (financial and other).
5) The activities promote public health.
6) Human activities are directed to the promotion of healthy and socially cohesive society and culture.

From the context of the Europe 2020 objectives and following strategic documents we move here towards two basic characteristics of the economy, which should be supported in the framework of sustainable growth, and which in the same time also define where we can identify and promote synergies of interventions:

- Low-carbon economy: reducing greenhouse gas emissions, energy saving and energy production from renewable sources,
- Circular economy: reducing the amount of consumption of natural resources and waste through efficient use of resources, reducing consumption and recycling.

5.3 The methodological approaches (quantitative and qualitative) for evaluating contributions to the Sustainable Growth)

5.3.1 The low-carbon economy: decreasing emissions of the greenhouse gases, energy savings and production of energy from renewable resources

The area of low-carbon solutions is, from the perspective of objectives and mechanisms, the best defined part of the strategic direction of the EU towards sustainable growth. There are three quantified targets that should be met by 2020. All three are also clearly measurable in terms of results, although on the other hand, our quantitative data cannot always provide answers what are the causes and context of changes and favourable or unfavourable trends.

Emissions of greenhouse gases, baseline year 2005: maximum increase by 13% by 2020 compared to 2005 (in sectors other than emission trading scheme (ETS).

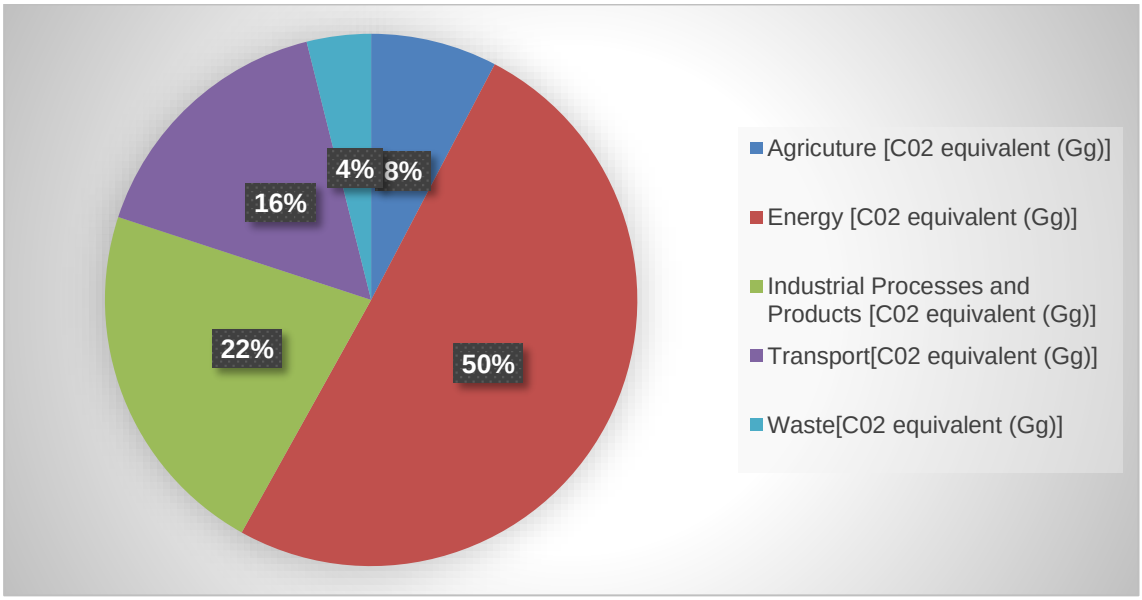
Socio-economic and environmental context for an assessment

Measurement of greenhouse gases emissions in Slovakia is defined and implemented at several levels. The largest sources of emissions are included in the ETS (Emission Trading System), which is outside of this objective and is covered and governed by its own rules. Land use change and forestry (Land use, land-use change and forestry LULUCF) are so far also not part of the target. The UN Secretariat on Climate Change

(United Nations Climate Change Secretariat) defines these emissions as those resulting from land-use change and forestry. This greenhouse gas inventory covers emissions and removals of greenhouse gases resulting from direct human-induced land use, land use change and forestry activities in.

Reduction of greenhouse gas emissions by 13% by 2020 (compared with the base year 2005) includes the other sources in the industry, energy and heat production, agriculture and waste (Box 11). As illustrated in Figure 5, the sovereign largest source of emissions is energy. This is primarily electricity generation, but also heat.

Figure 5: Shares of specific sectors in the greenhouse emissions in 2014



Source: SHMU/Enviroportal 2016.

The basic source of quantitative data is the monitoring conducted by the Slovak Hydro-meteorological Institute. The measured data are collected and analysed by the Ministry of Environment, Slovak Environmental Agency and the Statistical Office of the Slovak Republic. An important source of statistics are also quantitative data from the Ministry of Economy, as well as information from manufacturers and distributors of electricity and heat.

Quantitative data on GHG emissions is suitable to combined with quantitative data on the evolution and structure of the Slovak economy. By analysing different factors, we can better understand the causes of its decline and the risks of possible further increases, as well as the impact of interventions supported by the cohesion policy.

Box 11 Development and forecast of the greenhouse emissions

The quantitative data and analysis of trends indicates that emissions may by 2020, compared to the base year of 2005, decreased by around 24% (Baláž et al 2015). For 2013 it was planned for maximum possible increase of 2.3%, but the actual emissions decreased by 8%. In 2014 there was a decrease in emissions from energy production by up to 14.1%. If no unexpected changes, this goal will be significantly exceeded. There are multiply factors behind this development, but the impact of the intervention was significant. The impact is especially through intervention aimed at reducing energy consumption (heating), promotion of technological changes in the industry and changes in the structure of the economy. Very significant were interventions into energy production from biomass, less important effect we see in other types of renewable energy production.

Alongside the development of renewable energy, and energy efficiency, the reduction of emissions is also strongly affiliated with changes in the structure of the Slovak economy (higher share of services in GDP) and technological changes in the industry. There is impact of the economic crisis after 2009, and a tightening regulatory environment. Consideration should be given also to the effects of awareness and more economical behaviour of households. People increasingly understand the possibilities of saving energy and investing in energy-saving measures. Finally, there is influence of climate change affiliated with very mild winters, reducing heating requirements.

The EU primary target for the upcoming years are transport emissions, where aim is to reduce emissions by 2050 by at least 60% (compared to 1990 levels) and long term vision is zero emission transport. Emissions from transport in 2012 accounted for a total of 22% and presents a problem, as their share is increasing. Improving road infrastructure, which is important for the objectives of economic growth, may be in a conflict with emission reduction targets.

Additional problem are scattered emissions from fossil fuel combustion in households (non-point sources). There are no exact data on the impact of households, because outcomes depends on the the sources of the heating, heating season, boiler quality, quality of construction and many other factors creating a very wide spectrum. Due to the worsening economic status of some households (especially in marginalized regions) there is tendency to use less expensive and environmentally problematic fuels.

Source: European Commission[26]

The basic methodological approach to the evaluation of the project or program and its effect on the formation of emissions is usually defined by 4 steps:

- Defining the borders: By borders of assessment we determine what is necessary or desirable to include in the calculation. The European Investment Bank uses the term 'range' of a protocol that defines standards of evaluation and reporting (GHG Protocol Corporate Accounting and Reporting Standard).
- The Scope 1 / Effect on direct emissions: the emissions of greenhouse gases that physically occur within the scope of defined limits. For example, emissions produced by burning fossil fuels, industrial processes or emissions borne during the combustion for other reasons.

[26] More information at: http://ec.europa.eu/europe2020/europe-2020-in-a-nutshell/priorities/sustainable-growth/index_en.htm

- The Scope 2 / Impact on indirect emissions: Here it is all about greenhouse gas emissions from the generation of electricity consumed by the project, while indirect emissions are produced outside of the boundaries of the project or program. If we set boundary on the threshold of power station, it helps to include savings reached through the project into the final calculations. Standardizes approach in Europe is to calculate that average value of purchased electricity of 232 GWh / year will produce more than 100 kt CO2e / year.
- The Scope 3 / Other indirect greenhouse gas emissions: This may include emissions, which result from the measures undertaken by the project, but are not directly caused by sources operating within the project.

On the basis of defined boundaries and three levels of scope for the emissions it is then possible to quantify emissions generated by the measures under consideration, or by the project. A persistent problem is the availability of data (although it is improving) and the degree of uncertainty, which is relatively small in isolated projects, but it increases if we analyse wider objectives and interventions.

Quantitative measurement is therefore plausible to be combine with qualitative methods, especially in complicated assignments. Here qualitative approach may provide information on how best to set boundaries (step of defining the border) and how to map out possible indirect emissions in the scoping 2 and 3.

Allocations to investment priorities and evaluation methods

Reduction greenhouse gas emissions (non-ETS) by 13% by 2020 (compared with the base year 2005) is in the current 2014-2020 programming period managed mainly through these operational programmes:

The Operational Programme Research and Innovations:

- Investment Priority1.1 Enhancing research and innovation infrastructure and capacities to develop research and innovation excellence, and promoting centres of competence, in particular those of European interest.
- Investment Priority2.1 Enhancing the research activity of the Bratislava Self-Governing Region through revitalisation and fostering of research, education, innovation, and business capacities of research institutions in Bratislava.

The Integrated Regional Operational Programme:

- Investment Priority1.2: Development and improving environmentally-friendly including low-noise and low-carbon transport systems, including inland waterways and maritime transports, ports, multimodal links and airport infrastructure, in order to promote sustainable regional and local mobility

The Operational Programme Integrated Infrastructure:

Priority Axis 1 Railway infrastructure (TEN-T CORE) and renewal of rolling stock

- Investment Priority7i) Support to multimodal single European space via investment to the TEN-T,
- Investment Priority7iii) Development and modernisation of complex interoperable rail systems of high quality and support to the noise-decreasing measures

Priority Axis 3 Public passenger transport

- Investment Priority7ii) Development and improvement of the eco-friendly (including low-carbon and low-noise) transport systems, including inland waterways and marine transport, ports, multimodal connections and airport infrastructure, as to support sustainable regional and local transport means of the rail city mass transport.

Priority Axis 4 Waterway and airport infrastructure

- Investment Priority7i) Support to multimodal single European space via investment to the TEN-T

Priority Axis 5 Rail infrastructure (outside TEN-T CORE)

- Investment Priority7d) Development and modernisation of complex interoperable rail systems of high quality and support to the noise-decreasing measures

Rural Development Programme:
P4: Restoring, preserving and enhancing ecosystems related to agriculture and forestry

The total amount of allocations (including proportional technical assistance) for this target and its four investment priorities is set at €1726.35m. It should however be noted, that many other interventions such as building insulation, changing the fuel base, and increasing the share of renewables will have secondary effects on reducing greenhouse gas emissions. For identified investment priorities it is possible to propose the following evaluation methods.

Investment Priority 1.1 OPRI 'Enhancing research and innovation infrastructure and capacities to develop research and innovation excellence, and promoting centres of competence, in particular those of European interest'. To meet the national target €6.23m is allocated at this investment priority. Areas of intervention 065 (research and innovation infrastructure, processes, technology transfer and cooperation in companies focused on low-carbon economy and the resilience to climate change) is assigned to a combination of output O0070: Number of supported research bodies cooperating with industry, and the R0126: The number of patent applications. It also presupposes, that there will be 15 research institutions collaborating with firms and 10 submitted patent applications. Since these are relatively small target numbers, one may use for their evaluation appropriate combination of questionnaire survey and case studies.

Investment Priority 2.1 OPRI 'Enhancing research and innovation infrastructure and capacities to develop research and innovation excellence, and promoting centres of competence, in particular those of European interest.'. To meet the goals, €2.13m is allocated at this investment priority

Areas of intervention 065 (research and innovation infrastructure, processes, technology transfer and cooperation in companies focused on low-carbon economy and the resilience to climate change) is assigned with a combination of output O0070: Number of supported research bodies cooperating with industry and result R0126: The number of patent applications. The number of patent applications filed in Bratislava Region by 2023 is fixed at a target value of 63, which would allow for a sufficient sample for analysis and a questionnaire survey.

Investment Priority 1.2 IROP 'Development and improving environmentally-friendly including low-noise and low-carbon transport systems, including inland waterways and maritime transports, ports, multimodal links and airport infrastructure, in order to promote sustainable regional and local mobility'. The amount of € 123m is allocated for this investment priority.

- Area of intervention 090 (Biking and hiking trails) is assigned to a combination of output O0128 The length of new bike sections of roads, and to result R0157: The share of cycling in the overall division of transport work.
- Area of intervention 044 (Intelligent Transport Systems - including the introduction of demand management, toll systems, IT systems monitoring, control and information IT systems) is assigned to a combination of output O0134: Number of established systems, and to result R0164: Number of tickets sold for integrated transport system.
- Area of intervention 043 (Clean urban transport infrastructure and its support, including equipment and rolling stock) is assigned to a combination of indicators O0219: Number replaced by buses in urban and suburban services, and the result R0156: The share of low-floor buses in the total number of buses. The number of sold tickets in the integrated transport system should achieved 4,651,345. The share of low-floor buses in the total number of buses is expected to reach 11.25%. For the share of cycling in total traffic are not yet established targets. Length of new sections of cycling roads should, by the end of 2023 and in the less developed regions, reach 136 km, while in the more advanced regions it is 10 km. Number of new elements created for additional cycling infrastructure should be 68 (in less developed regions) and 5 in more developed.

Most of these results would be possible to analysed by aggregating and analysing project outcomes through the ITMS. For the numbers of passengers is the main evaluation approach using data from transport companies.

The Priority Axis 1 OP II ' *Railway infrastructure (TEN-T CORE) and renewal of rolling stock***'**
Investment Priority OP II 7i 'Support to multimodal single European space via investment to the TEN-T'. It is expected that investment in transport area will save time and emissions. To rate savings time, one can use the conversion methodology, which indicates that from the €588,684,851 we may, by 2023, get to the €343,475,242. Additional saving are on the account of decreased emissions of PM^{10} and NO_2 (due to the construction of highways). Assessment of the financial savings and emissions reductions are carried out using standard approaches, based of output indicators from the project.
Investment Priority OPII 7iii) 'Development and modernisation of complex interoperable rail systems of high quality and support to the noise-decreasing measures'. The amount of €545.85m is allocated for this investment priority. Area of intervention 027 (Mobile rail assets) is assigned with a combination of output time savings in railway transport - total volume of international transport on the TEN-T East / Eastern Mediterranean (segment of state border CR / SR - Kuty - Bratislava), while the result is the number of passengers transported in public rail transport. The main indicator is the

total volume of international transport on the TEN-T East / Eastern Mediterranean (border segment CR / SR - Kuty - Bratislava). It is measured in kilometres and from the base value of 1,205,396 km (in 2013) should reach a value of 1,307,279 km. Key data for the evaluation will be provided by the transport companies.

Investment Priority OP II 7ii 'Development and improvement of the eco-friendly (including low-carbon and low-noise) transport systems, including inland waterways and marine transport, ports, multimodal connections and airport infrastructure, as to support sustainable regional and local transport'. The amount of €322.3m is allocated for this investment priority.

The area of intervention 026 (Other railways) and 043 (reconstructed or improved other types of road, highways, national, regional or local roads) is assigned with a combination of result R0058: Number of passengers carried rail public transport in the cities of Bratislava, Košice, Žilina, Prešov and Banská Bystrica, a CO15 or total length of new or upgraded lines for trams or metro, O0190 or number of new rolling runway urban public transport (trams, trolleys) also suitable for passengers with reduced mobility. The total length of new or upgraded lines for trams or metro has to reach a 27.3 km, in total 8 terminal passenger traffic terminals should be build and the number of new rolling runway urban public transport, also suitable for passengers with reduced mobility, should reach 78. The main approach here is quantitative assessment on the basis of the investor data and output indicators from ITMS.

Investment Priority OP II 7iii: 'Development and modernisation of complex interoperable rail systems of high quality and support to the noise-decreasing measures'. The amount of €180m is allocated for this investment priority.

Area of intervention 027 (Mobile rail assets) is assigned with a combination of result R0053 - Time savings in rail transport - R0131 Total volume of international transport on the TEN-T East / Eastern Mediterranean (border segment CR / SR - Kuty - Bratislava) and the number of passengers transported in public rail transport. The total length of new or upgraded lines for trams or metro has to reach 27.3 km, and 8 passenger traffic terminal should be constructed while the number of new rolling urban public transport, also suitable for passengers with reduced mobility, should reach 78. The main approach to evaluation here is quantitative assessment on the basis of the investor data and output indicators from ITMS.

Priority Axis 4 Waterway and airport infrastructure 7i):'Support to multimodal single European space via investment to the TEN-T'. The amount of €116.45m is allocated for this investment priority.

Area of intervention 041 (Inland waterways and TEN-T ports) is assigned with a combination of result R0060: amount of realized freight transport performance in the Bratislava public port and the outcome O0191: number of modernized public ports in the TEN-T CORE network. The plan is to modernized 1 on port of the TEN-T CORE network and conducted 3 feasibility studies (in connection with the development of ports and waterways of the TEN-T CORE). The main approach to evaluation here is quantitative assessment on the basis of the investor data and output indicators from ITMS.

Investment Priority OP II 7d 'Development and modernisation of complex interoperable rail systems of high quality and support to the noise-decreasing measures'. The amount of €282.23m is allocated for this investment priority.

Area of intervention 025 (Railways - the comprehensive network TEN-T) and 026 (Other rail) is assigned with a combination of result R0061: rate of electrification of railway lines and outcome CO12: Total length of reconstructed or renovated railway lines. Altogether what is planned under this priority are 54.5 km of upgraded or rebuilt lines, 21.5 km of tracks in the TEN-T, and environmental liabilities will be eliminated in 3 locations. Length of railway lines (outside the TEN-T core) and with established ERTMS system is planned to be 182 km. The main approach is that of a quantitative assessment on the basis of the investor data and output indicators from ITMS. Mapping of the removal of old environmental liabilities can be combined with the research of the locations, and mapping of the impact on the environment and the economy.

Investment Priority OP RDP P4 'Restoring, preserving and enhancing ecosystems related to agriculture and forestry'. The amount of €106.73m is allocated for this investment priority.

Output indicator here is M10 - agro-environment-climate measures. Quantitative data on the projects and their scope could be combined with a qualitative approach to the evaluation on a sample of projects, which would provide for a further assessment of the impact of measures. Suitable methods could include application of the economic evaluation techniques on the benefits of agro-environment-climate measures, using environmental accounting and cost - benefit analysis.

Achieving the share of renewable energy in the total gross final energy consumption at the level of 14% by 2020.

Socio-economic and environmental context of the assessment

The renewable energy sources are defined as those that can be obtained from sources that are naturally renewed in short-term cycles of society and the economy functioning. These are the resources such as sunlight, wind, biomass, rain, tide-in / tide-out, and geothermal energy.

Slovakia aims to increase the use of renewable energy sources in proportion to the gross final energy consumption from 6.7% in 2005 to 14% in 2020. The main source of data on RES is the Statistical Office of the Slovak Republic. If necessary, the Ministry of Economy may amend current management of energy statistics by the Statistical Office of the Slovak Republic or to introduce monitoring of new selected indicators. Slovak Republic has a long-term increase in the share of renewable energy sources, but there is a large margin in faster growth and some risks associated mainly with the use of biomass (Box 12).

Box 12 Development and problems in increasing RES shares

Analysis of the available quantitative data shows that the production of renewable energy in 2012 reached 10.4%, but in 2013 fell slightly to 9.8%. Analysis of the situation and trends further indicates that 14% renewables target should be met, but it will not be automatic and there are risks stemming mainly from changes in the business environment.

Strong impact of the intervention was primarily in the production of energy from biomass. In other sectors of renewable energy sources (photovoltaic, wind, hydro, geothermal) has been increasing share of renewables attributed mainly to the outcomes of feed-in tariffs and private investment. Strong reserves exist in the use of renewable sources in Slovak households.

Biomass with a theoretic potential of 120 PJ has the biggest energy potential in renewables according to the governmental energy policy. At the same time it is the most important potential for development of regional and local economies. Projects on the biomass use were dominant also in the number of projects using the EU assistance. There were 40 implemented and 44 contracted projects. Most of these projects related to heating public buildings, schools and other premises and transfer of heating plants to combustion of biomass. A model based on support of heat production and its use to heat schools and public buildings seems to be as very appropriate for local economy. On the other hand, combined combustion of biomass and production of wooden chips in large heating plants seems to be rather problematic. High consumption of biomass increases its price and high-quality wooden material is combusted which could be used to produce products with higher added value. Financial support of large projects on energy production from biomass can cause the lack of cheap biomass for heat production in the future.

Rather specific area of intervention is transport. Among objectives is also Slovakia's commitment to increase the share of renewable energy in all transport modes to 10%. Funds and direct intervention has so far not supported proliferation of biofuels. Their use in Slovakia is supported mainly by the Law on Tax Duty on Mineral Oil. There is a presumption that investment in agriculture and rural development could have an indirect impact on the development and cultivation of biofuel processing. Achieving a 10% share by 2020 will also depend on the price development, availability of the fuels and ability to produce so-called biofuels of second generation..

There are rather elaborated statistics of the Statistical Office of the Slovak Republic and data available at the EU-level regularly analysed by the European Statistical Office. Energy companies have precise records of renewable energy sources connected to the network. Quantitative data on biofuel can be obtained from the 'Report on compliance with the requirements to supply the market with biofuel,' which is compulsory under the law on renewable energy sources. Eurostat publishes data on biofuels in a separate tables ('SHARES') mentioning the share of energy from renewable sources in energy consumption in transport and other sectors of the economy covered by the Directive on renewable energy.

Designed capacity and the cost of producing energy from renewable sources are relatively simple mathematical calculation based on technical parameters of used technologies and energy prices. An interesting issue is the analysis of the secondary effects on economic development at the local level, employment, as well as some of the negative connotations associated with the rising price of biomass. For these areas it appears to be the optimal to use qualitative methods that should give us information on both positive and negative effects, as well as to help identify opportunities for improving interventions and redefining targets.

Allocations to investment priorities and evaluation methods

The target of achieving the share of renewable energy in total gross final energy consumption, 14% by 2020, is in the current programming period 2014-2020 mainly addressed through the Operational Programme Quality of Environment, investment priorities 4.1 *Energy-efficient low-carbon economy* and 4.2 *Support for energy efficiency and use of energy from renewable sources in enterprises*. The total amount of allocation in the OP QE (including proportional technical assistance) is set for this target at the level of €173.23m. It should be noted however, that many other interventions, such as the OP R&D, or low-carbon strategies may have may have indirect yet sound impact on this target.

Achieving the target is measured by combinations of indicators, where the output indicators measure the increase in capacity for the production of energy from renewable sources and indicators of results provide information on the installed capacity and the share of renewables in total energy production:

- Area of intervention 012 (other sources of renewable energy, including hydropower, geothermal energy and marine energy) and the integration of renewable energy sources (including the infrastructure for storage, converting electricity to gas and renewable hydrogen) is assigned with a combination of output O00188: Increased capacity of electricity generation from renewable sources and the result R0015: the share of RES in gross final energy consumption of the SR.
- Area of intervention 010 (renewable energy - solar power), and 011 (renewable energy - biomass) are associated with a combination of output O00188: Increased capacity of electricity generation from renewable sources, and the results R0015: The share of RES in gross final energy consumption of the SR, and R0115: installed capacity of small renewable energy facilities in households of Bratislava Region.

By 2023 should the Slovak Republic reach 15.5% share of energy from renewable sources. Installed capacity of small renewable energy facilities in households in Bratislava Region should by 2023 reach 1 MW. As many as 35 firms should be supported and a number of small plants for the use of renewable energy sources in the less developed regions of Slovakia is planned at the level of 70,000, while in more developed regions it should reach 3000. To evaluate this target, quantitative analysis is essential, dealing with the number and aggregate output of RES. While data on the projects supported by the cohesion policy can be obtained from the analysis of reported data, it is equally important to analyse context, i.e., private investment in renewable

energy sources that can be provided by distribution companies and the Office for Regulation of Network Industries.

Reduction in final energy consumption by 11% by 2020 (relative to the 2001-2005 average).

Socio-economic and environmental context for evaluations

The energy saving has become a key EU approach. Slovakia, as a Member State has duty to establish mandatory energy efficiency scheme, serving as a tool through which the energy suppliers achieve cumulative savings target by 31 December 2020[27]. The resulting value of cumulative energy savings target for the years 2014 to 2020 was fixed in the amount of 26,565 GWh (in energy consumption). This value represents annual energy savings of 948.75 GWh/year (3,416 TJ)

There are six basic areas of targeted policies directed towards energy savings: the buildings, industry, public sector, transportation, appliances, and voluntary agreements. The primary source of quantitative data is the Statistical Office of the Slovak Republic, while further information can be obtained from the monitoring of EU-SILC.

Efficiency in industry has been increasing, and economic growth is reached with reducing energy consumption. Apartments, houses and public buildings are thermally insulated using various subsidy schemes and commercial programs. Energy efficiency targets for primary and final energy consumption should be reached. A large part of investments from the EU funds has been directed to energy efficiency in industry and in public buildings. According to the monitoring data are planned values of savings and insulations reached and exceeded. Impact interventions SF and CF in this area is very important.

There is substantial potential for savings in the part of households, and in the current programming period it is planned by the Government to support them through a variety of initiatives, partly co-financed by the EŠIF. It would be however necessary also focus on low-income households, often omitted for various reasons from participation in different support schemes, they lack access, and there may face so called paradox of energy poverty. I.e., low-income households may pay more for the energy than households with higher incomes.

An important challenge is to develop systematic approaches to the evaluation of the contribution of programs aimed at energy savings through standardization, and through shared approaches using *Uniform Methods Project*. Deploying to this method it should be possible to identify and systematically monitor savings achieved through measures and programs, while the bases of the approach is:

- Description of the measures and conditions for their application;
- The algorithm for estimations of savings;
- Example of an another program that offers alternative solutions;
- Assessment of procedures for measuring and verifying, including the International Performance Measurement and Verification Protocol (IPMVP) [28];
- The data requirements for verification and recommended methods of data collection;
- Recommendations for elements of program evaluation;

[27] Article 7 part 1 Directive 2012/27/EU

[28] The manual with advice, examples of good practice how to measure and verify energy savings is available at: http://www.nrel.gov/docs/fy02osti/31505.pdf

- Alternatives for more economical implementation and approaches.

Evaluation of benefits reached through the implemented energy saving measures is in its essence simple. It means consumption before implementing the measures less consumption after implementation, plus / minus countervailing factors (e,g. change in the weather, the number of people or ways how the insulated building is used). The aim of a systematic methodological approach should, however, be based on a comprehensive assessment including the assessment of financial requirements and alternative solutions.

Allocations to investment priorities and evaluation methods

The objective of reducing final energy consumption by 11% by 2020 (relative to the average of 2001-2005) is in the current programming period 2014-2020 addressed mainly through following three operational programmes:

- The Operational Programme Research and Innovations: Investment Priority 1.2 Promoting business investment in research and innovation, and developing links and synergies between enterprises, research and development centres and the higher education sector, in particular promoting investment in product and service development, technology transfer, social innovation, eco-innovation, public service applications, demand stimulation, networking, clusters and open innovation through smart specialisation, and supporting technological and applied research, pilot lines, early product validation actions, advanced manufacturing capabilities and first production, in particular in key enabling technologies and diffusion of general purpose technologies and Investment Priority 2.2 Promoting business investment in research and innovation, and developing links and synergies between enterprises, research and development centres and the higher education sector, in particular promoting investment in product and service development, technology transfer, social innovation, eco-innovation, public service applications, demand stimulation, networking, clusters and open innovation through smart specialisation, and supporting technological and applied research, pilot lines, early product validation actions, advanced manufacturing capabilities and first production, in particular in key enabling technologies and diffusion of general purpose technologies. Important is also 3.1. Promoting entrepreneurship, in particular by facilitating the economic exploitation of new ideas and fostering the creation of new firms, including through business incubators.
- ***Operational Programme Quality of Environment***: Investment Priority 4.2 Promoting energy efficiency and renewable energy use in enterprises, 4.3 Supporting energy efficiency, smart energy management and renewable energy use in public infrastructure, including in public buildings, and in the housing sector, 4.4 Promoting low-carbon strategies for all types of territories, in particular for urban areas, including the promotion of sustainable multimodal urban mobility and mitigation-relevant adaptation measures; and 4.5 Promoting the use of high-efficiency co-generation of heat and power based on useful heat demand.

- ***Integrated Regional Operational Programme***: Investment Priority 4.1: Supporting energy efficiency, smart energy management and renewable energy use in public infrastructure including in public buildings and in the housing sector

The total amount of allocations (including proportional part of the technical assistance) for this objective is in all investment priorities set at totalling €986.28m. But it is likely that many other investments in the business sector, rural development and the like may also have secondary impacts on reducing energy consumption. For identified four investment priorities it is possible to propose the following evaluation methods:

Investment Priority1.2 OPRI 'Promoting business investment in research and innovation, and developing links and synergies between enterprises, research and development centres and the higher education sector, in particular promoting investment in product and service development, technology transfer, social innovation, eco-innovation, public service applications, demand stimulation, networking, clusters and open innovation through smart specialisation, and supporting technological and applied research, pilot lines, early product validation actions, advanced manufacturing capabilities and first production, in particular in key enabling technologies and diffusion of general purpose technologies'. The amount of €51.24m is allocated for this investment priority.

Area of intervention 069 (support for environmentally friendly production processes and resource efficiency in SMEs) is assigned with a combination of output CO01: The number of companies receiving support, and the result R0046: Share of enterprises applying research, development and innovation. Amount of private investment in research and development in Slovakia (except for the Bratislava region) has achieved €150m. About 1830 enterprises should receive the support and as many as 1500 financial grant. Non-financial support should be given to 1,000 businesses. Support is also planned 130 new businesses.

The extend to what the allocated funds have contributed to energy savings is possible to examine using the combination of analysis of output indicators of the project and questionnaire research that would focus on the benefits of supported projects in fulfilling of the strategic target.

Investment Priority 2.2 OPRI 'Promoting business investment in research and innovation, and developing links and synergies between enterprises, research and development centres and the higher education sector, in particular promoting investment in product and service development, technology transfer, social innovation, eco-innovation, public service applications, demand stimulation, networking, clusters and open innovation through smart specialisation, and supporting technological and applied research, pilot lines, early product validation actions, advanced manufacturing capabilities and first production, in particular in key enabling technologies and diffusion of general purpose technologies'. The amount of €1.42m is allocated for this investment priority.

The area of intervention 069 (support for environmentally friendly production processes and resource efficiency in SMEs) is assigned with a combination of output CO01: The number of companies receiving support, and the result R0126: Share of enterprises applying research, development and innovation. Number of supported enterprises in developed regions is projected to reach number 10 (support), while another 10 should receive grants. In addition, 5 new businesses should be supported. Number of enterprises cooperating directly with research or applying the research outcomes is set to be at least 20.

It is quite difficult to quantify benefits of this priorities for energy savings. It will require a combination of quantitative methods (aggregated analysis of project outputs and indicators), combined with questionnaire surveys, and depending on the number of undertakings, also possibly targeted qualitative research.

Investment Priority 3.1 OPRI 'Promoting entrepreneurship, in particular by facilitating the economic exploitation of new ideas and fostering the creation of new firms, including through business incubators'. The amount of €24.40m is allocated for this investment priority.

Areas of intervention 068 (Energy efficiency and demonstration projects for SMEs and support measures) and 069 (Support for environmentally friendly production processes and resource efficiency in SMEs) are assigned with a combination of output CO01: The number of companies receiving support, and the result R0048: the survival rate of new businesses on the market after two years.

The benefits of this priority for energy savings could be evaluated by a suitable combination of quantitative methods (aggregated analysis of project outputs and indicators), combined with questionnaire surveys and, depending on the number of undertakings, also by a targeted qualitative research.

Investment Priority 4.1 OPRI 'Supporting the capacity of SMEs to grow in regional, national and international markets, and to engage in innovation processes'. The amount of €1.98m is allocated for this investment priority.

Area of intervention 069 (support for environmentally friendly production processes and resource efficiency in SMEs) is assigned with a combination of output CO01: The number of companies receiving support, and result R0130: the proportion of profitable SMEs in the Bratislava Region.

The benefits of this priority for energy savings will be evaluated using qualitative methods and by using analyses of the growth of regional, national and international markets, and the quality and impact of innovations.

Investment Priority 4.2 OPQE 'Promoting energy efficiency and renewable energy use in enterprises'. The amount of €110m is allocated for this investment priority.

Areas of intervention 068 (Energy efficiency and demonstration projects and support measures for SMEs) is assigned with a combination of output CO01: The number of companies receiving support, and the result R0114: energy intensity of production. Area of intervention 070 (Promotion of energy efficiency in large companies) is assigned with

a combination of output CO01: The number of companies receiving support and the result R0114: energy intensity of production.

The energy intensity of production is supposed to fall from the baseline amount of 2,132 to 1,600 MWh / €m. It is planned to support 220 businesses, and this measure will have the effect of increasing the production of energy from renewable sources, reducing energy consumption and consequently greenhouse gas emissions.

For evaluating the benefits would be appropriate a combination of quantitative and qualitative methods, while analysis of output indicators and standard methods of calculation of savings in the amount of carbon dioxide will provide overall results. For the analysis of supported enterprises and implemented measures it would be appropriate to use a questionnaire-based surveys.

Investment Priority 4.3 OPQE 'Supporting energy efficiency, smart energy management and renewable energy use in public infrastructure, including in public buildings, and in the housing sector'. The amount of €351.42m is allocated for this investment priority.

Area of intervention 013 (restoration of public infrastructure to ensure energy efficiency, demonstration projects and support measures) is assigned with a combination of output O0187: Reduction of final energy consumption in public buildings, and the result R0124: The energy demands of public buildings. The energy demands of public buildings has to, in less developed regions, declined from 190 to 58 kWh / (m2.year). The number of public buildings with low-energy, ultra-low-energy or nearly zero consumption should reach the number 550.

In addition to analysing the ITMS and projects outcome data, it is possible to add additional data using questionnaire survey.

Investment Priority 4.4 OPQE 'Promoting low-carbon strategies for all types of territories, in particular for urban areas, including the promotion of sustainable multimodal urban mobility and mitigation-relevant adaptation measures'. The amount of €123.47m is allocated for this investment priority.

Area of intervention 013 (restoration of public infrastructure to ensure energy efficiency, demonstration projects and support measures) is assigned with a combination of output O01778: Number of completed informative activities, and results R0125: Proportion of the population living in the areas where awareness of low-carbon measures have been carried out. The share of the population living in areas where awareness raising activities on low-carbon measures were conducted (in less developed regions) has to achieve 84%.

In addition to calculations the population living in areas exposed to information activities, it would be possible to assess the quality of information activities through questionnaire surveys and qualitative evaluation methods.

Investment Priority 4.5 OPQE 'Promoting the use of high-efficiency co-generation of heat and power based on useful heat demand'. The amount of €185m is allocated for this investment priority.

Area of intervention 016 (High-efficiency cogeneration and district heating) is assigned with a combination of output O0039: The amount of heat produced by high-efficiency

cogeneration based on useful heat demand, and the result R0121: Proportion of heat supplied produced by the CHP to the total heat delivered. The share of supplied heat produced by the CHP to the total heat delivered is supposed to rise from 30 to 40%, while in less developed regions there should be 25 schemes for heating systems with higher efficiency.

Technical parameters of fulfilment of these objectives will require an aggregated analysis of output indicators of the projects, possibly combined with a questionnaire survey of end users.

Investment Priority 4.1 IROP 'Supporting energy efficiency, smart energy management and renewable energy use in public infrastructure including in public buildings and in the housing sector'. The amount of €111.39m is allocated for this investment priority.

Area of intervention 014 (Renewal of existing residential buildings to ensure energy efficiency, demonstration projects and support measures) is assigned with a combination of output O0169: Energy efficiency of residential buildings, and the result R0255: Final energy consumption. The energy performance of residential buildings has consistently for both more and less developed regions decline to 53 kWh / (m2 / year). In the less developed regions, it is expected to reach number of 22,226 households in improved energy class, while in the more developed it should be 11,570.
The fulfilment of technical parameters for these objectives will require an aggregated analysis of output indicators of the projects, while it would be possible to combine it with a questionnaire survey of end users.

5.3.2 The circular economy: decreasing consumption of the natural resources and waste via efficient use of resources, decreasing consumption, and recycling

The Circular Economy is a long-term strategic vision of the European Union. While classical linear economy is based on the conversion of natural resources and labour to goods and waste, circular economy has strategic direction to the zero waste and pollution. Natural resources must be used and circulated within the economic system in closed loops, used again and recycled.

Efficient use of resources is for the Slovak Republic a key challenge, it improves competitiveness and reduce costs in industrial production and services. Importance of energy efficiency for Slovak companies is also clear from the 2008 – 2013 statistics for the entire national economy (industry, services, public sector and households).

In comparison with 2008, in 2013 (latest data available), the relative use (per EUR added values) for electricity fell by 9.3%, for diesel by 17.2% and for natural gas by 16. 0%. From the aggregated data it is not possible to monitor changes in energy efficiency specifically for individual sectors, but we know that the industry share in the total electrical energy consumption accounts for about one-half.

Real improvements in energy efficiency in the industry was most likely even higher in other sectors, due to the faster growth of labour productivity in this segment of the

national economy. The reduction of energy consumption in industry may have several contributing factors, especially the change of industrial structure and the shift to a more knowledge-intensive production. This change resulted from investment from private sources (own funds of enterprises and loans) and aimed at increased productivity, as well as from investments from public (especially European) funds focused on products and process innovation, while enhancing energy efficiency. European sources play in this respect an important role, just contracted allocation under Priority Axis 2 'Energy' of the OP R&D reached by the end of 2014 total value of €641.84m.

In the area of natural resources consumption, resource productivity measured by the ratio of GDP to domestic material consumption (expressed in € / kg) is used as the main indicator. Slovakia in 2013 reached the value of € 0.83/kg[29]. The basic concept how to create sustainable growth is called decoupling - raising economic growth should be simultaneously combined with the reduction of the amount of consumed natural resources and reduction of waste produced. Analysed indicators for Slovakia show, that there is indeed a decoupling of economic growth with accompanied reduction of material and energy intensity of the economy. There is no doubt that this trend is affiliated with the result of cohesion policy. Whether it's investment in reducing energy consumption in industry, or investment in new production technologies which consume lower amounts of inputs. An important factor is also development of environmental management, which aims to improve management of resources and recycling.
In the context of the evaluation of measures and programs, attention is focused on four main areas[30]:

- Soil: The total area of land use
- Materials: total tonnage divided into biological materials and minerals
- Water: water consumption in litres
- Energy: Energy consumption and carbon dioxide.

Methodological approaches to assessing the energy consumption and greenhouse gas measurement are discussed in the first part of this chapter. Methodology for the other three approaches is still the subject of professional debate within the European Union but essentially follows a similar logic. This means defining the borders, and use of quantitative and qualitative methods of analysis.

Allocations to investment priorities and evaluation methods
In addition to the three clearly defined national goals, there is a whole range of planned interventions, directly or indirectly relevant to the targets and which are defined in general terms by the concept of sustainable growth and / or circular economy (we grouped them into the category of 'Sustainable growth - general')
The problem of reducing the consumption of natural resources is in the current programming period 2014-2020 mainly addressed through the following operational programs:

[29] The higher ratio indicates higher efficiency and growth based on lower consumption of resources. The EU recommends the indicator. Example for the indicator: the EU average was 1.76 euros / kg, but the individual values ranged between 0.3 to 3.5 in 2013..
[30] See for instance Sustainable Research Institute (SERI) 2014, Austrian Academy of Sciences 2015: *Measuring the use of natural resources and its impacts/Indicators and their application*.

- **Operational Program Human resources, Investment Priority 6.1**. 'Providing support for physical, economic and social regeneration of deprived communities in urban and rural areas'.
- **Operational Program Quality of Environment, Investment Priority 1.1**. 'Investing in the waste sector to meet the requirements of the Union's environmental acquis and to address needs, identified by the Member States, for investment that goes beyond those requirements', 1.2. 'Investing in the water sector to meet the requirements of the Union's environmental acquis and to address needs, identified by the Member States, for investment that goes beyond those requirements', 1.3. 'Protecting and restoring biodiversity and soil and promoting ecosystem services, including through Natura 2000, and green infrastructure', 1.4. 'Taking action to improve the urban environment, to revitalise cities, regenerate and decontaminate brownfield sites (including conversion areas), reduce air pollution and promote noise-reduction measures' 2.1. 'Supporting investment for adaptation to climate change including ecosystem - based approaches', and 3.1. 'Promoting investment to address specific risks, ensuring disaster resilience and developing disaster management systems'.
- **Integrated Regional Operational Programme, Investment Priority 4.2**. 'Investing in the water sector to meet the requirements of the Union's environmental acquis and to address needs, identified by the Member States, for investment that goes beyond those requirements', and 4.3. 'Taking actions to improve the urban environment, to revitalize cities, regenerate and decontaminate brownfield sites (including conversion areas), reduce air pollution and promote noise-reduction measures'.
- **Rural Development Programme, Priority P2** 'Enhancing the viability and competitiveness of all types of agriculture, and promoting innovative farm technologies and sustainable forest management', **Priority P3** 'Promoting food chain organisation, animal welfare and risk management in agriculture', **Priority P4** 'Restoring, preserving and enhancing ecosystems related to agriculture and forestry', and **Priority P5** 'Promoting resource efficiency and supporting the shift toward a low-carbon and climate-resilient economy in the agriculture, food and forestry sectors'.
- **Operational Programme Fisheries, Specific Objective 2.3**. 'Protection and restoration of aquatic biodiversity and enhancement of ecosystems related to aquaculture and promotion of resource efficient aquaculture'.

The total amount of allocations (including proportional technical assistance) for this targets and in all investment priorities set at the level of €2.981m. For the identified investment priorities it is possible to propose the following evaluation methods:

OPHR Investment Priority 6.1. 'Providing support for physical, economic and social regeneration of deprived communities in urban and rural areas'. The amount of €41.3m is allocated for this investment priority (excluding technical assistance).

- Area of intervention 017 (household waste management - including measures to minimization, separation, recycling) is assigned with a combination of output

O0194: Population using improved housing, and the result R0144: Number of Roma dwellings with good living conditions.

- Area of intervention 020 (water supply for human consumption - extraction, purification, infrastructure for storage and distribution). This includes also the area of intervention 022 (Waste Water Treatment). The number of Roma dwellings with good living conditions should rise to 12,216, while number of MRC households with access to drinking / potable water should increase from the present 89 to 100%.

Fundamental research approach here is update of the Atlas of Roma Communities, supplemented by field qualitative research to verify the macro data.

OPQE, Investment Priority1.1 'Investing in the waste sector to meet the requirements of the Union's environmental acquis and to address needs, identified by the Member States, for investment that goes beyond those requirements.' The amount of € 402.88m is allocated for this investment priority.

- Area of intervention 017 Management of household waste (including measures to minimization, separation, recycling) is assigned with a combination of output CO17: Increased capacity – recycling, and result R0001: The proportion of recycled waste in the total amount of the waste generated.
- Area of intervention 018 Management of household waste (including arrangements for a mechanical biological treatment, heat treatment, incineration and landfill) is assigned with a combination of output CO002: Increased capacity for separated waste collection, and the result R0001: The proportion of recycled waste in the total amount of waste generated.
- Areas of intervention 019 Dealing with commercial, industrial or hazardous waste, is assigned with a combination of output C0003: Increased capacity for waste recovery, and result R0001: The proportion of recycled waste in the total amount of waste generated.

The proportion of recycled waste in total waste generated should incree from the present 44.72% to anticipated 60%. This should be enabled by increased recycling capacity, separation and recovery of waste. Evaluation of these quantitative targets is subject to verification using standardized methods.

OPQE Investment Priority 1.2 'Investing in the water sector to meet the requirements of the Union's environmental acquis and to address needs, identified by the Member States, for investment that goes beyond those requirements.' The amount of €497.84m is allocated for this investment priority.

- Area of intervention 020 (water supply for human consumption - extraction, purification, infrastructure for storage and distribution) is assigned with a combination of output CO18: Increased population with improved drinking water supply, and the result R0003: Population connected to public water supply.

- Area of intervention 021 (water management and drinking water - including river basin management, water supply, specific measures for adapting to climate change, remote and consumer measurement devices, charging systems and reducing leakages) is assigned with a combination of output O006: Number of supported objects in monitoring network for surface and groundwater, and result R0004: Share of monitored water bodies in the total number of water bodies.
- Area of intervention 022 (Waste Water Treatment) is assigned with a combination of output CO19: Increased population with improved urban waste water treatment, and result R0120: Number of inhabitants connected to the collection and treatment of urban waste water. Population connected to a drainage system and waste water treatment should, until 2023, reach the 3,836,296 inhabitants.

Evaluation will require a combination of quantitative data on the followed parameters, provided by water companies SHMU, SEA. For the analysis of the problems in increasing access to drinking water, it is necessary to analyse context of economic indicators such as prices for water supply/sewage and qualitatively assess potential barriers to achieving the objectives.

OPQE Investment Priority 1.3 'Protecting and restoring biodiversity and soil and promoting ecosystem services, including through Natura 2000, and green infrastructure'. The amount of €150.60m is allocated for this investment priority.

- Area of intervention 085 (Protection and enhancement of biodiversity, nature protection and green infrastructure) is assigned with a combination of output CO23: area of habitats supported to achieve a better state of conservation, and result R006: The number of habitats and species in favourable conditions.
- Area of intervention 086 (protection, restoration and sustainable use of Natura 2000 sites) is assigned with a combination of output O0010: Number of implemented elements of green infrastructure, and result R006: Number of habitats and species in favourable conditions. The target is 112 habitats in favourable conservation status and to decrease number of unknowns habitats to 10.

Mapping outcomes would depend on requires on analysis of the projects results undertaken in the context of Slovak habitats research.

OPQE Investment Priority 1.4 'Taking action to improve the urban environment, to revitalise cities, regenerate and decontaminate brownfield sites (including conversion areas), reduce air pollution and promote noise-reduction measures.' The amount of €390.45m is allocated for this investment priority.

- Area of intervention 083 (measures to ensure air quality) is assigned with a combination of output O0174: Installed capacity of low-emission equipment substituting outdated combustion of the heat source for heating, with the result R0122: Production of particulate matters PM, and O0177: Number of supported devices of medium and large scale stationary sources of air pollution to reduce emissions, with the result R0123: the production of emissions of selected pollutants.

- Area of intervention 089 (reclamation of industrial sites and contaminated land) is assigned with a combination of output CO22: The total surface of the reclaimed land, and the result R0009: Percentage of rehabilitated sites in the total number of registered sites of environmental liabilities in Slovakia.

Mapping and analysis of such a wide range of targets and indicators will require the specification and targeted combination of quantitative and qualitative methods specific to each test area.

OPQE Investment Priority 2.1 'Supporting investment for adaptation to climate change including ecosystem - based approaches.' The amount of €419.35m is allocated for this investment priority.

Area of intervention 087 (measures in the field of climate change adaptation and risk prevention and management of climate-related events such as erosion, fires, floods, storms and droughts, including awareness-raising, civil protection systems and infrastructures for disaster management) is assigned with a combination of output indicator CO20: population benefiting from flood protection measures, and the result R0010: the number of people living in areas with the existence of flood risk. The later number should be reduced from 124,878 (2013) to 110,859 persons in 2023.

Evaluation of achievements of the targets requires regularly reviewed and updated flood maps, as well as ongoing monitoring of climate change impacts, changes in the landscape and the measures taken.

OPQE Investment Priority 3.1 'Promoting investment to address specific risks, ensuring disaster resilience and developing disaster management systems.' The amount of €260.90m is allocated for this investment priority.

Area of intervention 087 (measures in the field of climate change adaptation and risk prevention and management of climate-related events such as erosion, fires, floods, storms and droughts, including awareness-raising, civil protection systems and infrastructures for disaster management) is assigned with a combination output indicator O0023: number of early warning systems (two are planned), and the result R0012: Percentage of populated areas covered and secured with early warning system (it has to reach 80%).

Technical parameters of an early warning system should be reviewed also qualitatively, using questionnaire surveys, so the targets could be verified.

IROP Investment Priority4.2 'Investing in the water sector to meet the requirements of the Union's environmental acquis and to address needs, identified by the Member States, for investment that goes beyond those requirements.' The amount of €55.00m is allocated for this investment priority.

- Area of intervention 020 (water supply for human consumption - extraction, purification, infrastructure for storage and distribution) is assigned with a combination of output C018: Increased population with improved drinking water supply, and the result R0003: Population connected to public water supply.

- Area of intervention 022 (Waste Water Treatment) is assigned with a combination of output C019: Increased population with improved urban waste water treatment, and result R0120: Number of inhabitants connected to the collection and treatment of urban waste water. With this priority, there is an overlap with the goals of the OP QE Investment Priority1.2.

Coordinated and comprehensive assessment will require a combination of quantitative data facilitated by water companies, SHMU, and SEA, which would provide data on end users. For the analysis of the problems with increasing access to drinking water it is necessary to analyse also the economic indicators of water supply/sewage prices and qualitatively assess potential barriers to achieving these targets.

IROP Investment Priority 4.3 'Taking actions to improve the urban environment, to revitalize cities, regenerate and decontaminate brownfield sites (including conversion areas), reduce air pollution and promote noise-reduction measures.'

Area of intervention 085 (Protection and enhancement of biodiversity, nature protection and green infrastructure) is assigned with a combination of output O0155: Number of completed elements of green infrastructure, and the result R0105: Proportion of green infrastructure in the total area of towns. The share of green infrastructure in the total area of towns is to increase from 3.0 to 3.1%.

In evaluation research it is possible to combine quantitative methods with the support of geographic information systems and qualitative research focused on the quality of the urban environment.

RDP Investment Priority P2. 'Enhancing the viability and competitiveness of all types of agriculture, and promoting innovative farm technologies and sustainable forest management.' The amount of €16.58m is allocated for this investment priority. The main areas of interventions cover:

- Knowledge transfer and information actions (M01)
- Consulting services, services of assistance in farm management, and assistance for agricultural firms management (M02)
- Investment in tangible assets (M04)
- Developing of agricultural business development of entrepreneurship (M06) and
- Promoting cooperation (M16).

Target indicator is the number and percentage of farms receiving support for investment restructuring and modernization from the Rural Development Program. Several output indicators are planned, concentrating on measuring training / skills acquisition, total public expenditure on training / skills of trainees. Further, the number of beneficiaries (agricultural firms) receiving assistance is to be measured, as well as number of to start-up businesses on small farms, and the amount of public expenditure.
The objectives of this measure can be analysed, mainly qualitatively, through the assessment at the level of individual projects, and at the level of assessments of the barriers and incentives for building sustainable agriculture and forestry.

RDP Investment Priority P3 'Promoting food chain organisation, animal welfare and risk management in agriculture.' The amount of € 51.95m is allocated for this investment

priority. The main areas of interventions cover: Knowledge transfer and information actions (M01)

- Consulting services, services of assistance in farm management, and assistance for agricultural firms management (M02)
- Investment in tangible assets (M04)
- Developing of agricultural business development of entrepreneurship (M06) and
- Promoting cooperation (M16).

Target indicator is the number and percentage of farms receiving support for investment restructuring and modernization from the Rural Development Program. Several output indicators are planned, concentrating on measuring training / skills acquisition, total public expenditure on training / skills of trainees. Further, the number of beneficiaries (agricultural firms) receiving assistance is to be measured, as well as number of to start-up businesses on small farms, and the amount of public expenditure.
Quantitative assessment of the share of domestic producers on the domestic market and share of export may be combined with an analysis of Slovak farms.

RDP Investment Priority P4 'Restoring, preserving and enhancing ecosystems related to agriculture and forestry.' The amount of 560.09m is allocated for this investment priority. The main areas of interventions cover:

- Knowledge transfer and information actions (M01)
- Consulting services, services of assistance in farm management, and assistance for agricultural firms management (M02)
- Investment in tangible assets (M04) and
- Promoting cooperation (M16).

The two major cross-cutting measures which are affiliated with promotion of sustainable growth in the agricultural sector are M10 (agro-environment-climate) and measure M11 (organic farming). Connected to these two are payments related to Natura 2000, according to the Water Framework Directive (M12) and payments to areas facing natural or other specific constraints (M13). There are several output indicators planned, concentrating on measuring training / skills acquisition, and total public expenditure on training / skills of trainees. The main indicators deal with the number of operations and the investments. Specifically, the payment needs to be analysed for areas covered by the measure M12 and M13. For this priority it is planned to use several of output indicators that range from mapping the training / skills acquisition, total public expenditure on training / skills of trainees, the number of recipients who have received counselling to the surface (ha) under the agro-environmental- climate measures, conversion to organic farming, forest land in Natura 2000 or the number of farms involved in the collaboration / promotion between local actors in the supply chain.

With such a widely defined program objectives any selection of a particular evaluation methodology inevitably depends on the particular segment of the investment priorities to be evaluated.

RDP Investment Priority P5 'Promoting resource efficiency and supporting the shift toward a low-carbon and climate-resilient economy in the agriculture, food and forestry sectors.' The amount of €14.25m is allocated for this investment priority.

The output indicators are mapping training / skills acquisition, exchange farm programs and demonstration activities. As in the priority P4, selection of a particular methodology eventually depends what is the particular segment of the investment priorities we plan to evaluate. The main interventions are:

- knowledge transfer and information actions (M01);
- investment in tangible assets (M04); and
- developing of agricultural business development of entrepreneurship (M06).

Several output indicators are planned, concentrating on measuring training / skills acquisition, and total public expenditure on training / skills of trainees. The main indicators is the number of operations and the investments.

Analysis of trends in the transition to a low-carbon economy, resilient to climate change, will be an important part of fulfilling the obligations of Slovakia, as we may see them in the upcoming goals of Europe 2030. Quantitative assessment can provide context for the qualitative assessment of climate resilience in the agricultural, food and forestry sectors.

OPF Specific Objective 2.3 'Protection and restoration of aquatic biodiversity and enhancement of ecosystems related to aquaculture and promotion of resource efficient aquaculture.' The amount of €2.17m is allocated for this investment priority.

Areas of intervention 01 (productive investments in aquaculture) is assigned with a combination of output indicator of changes in the volume of production in recirculating systems (t), and the result 2.2: Number of projects focused on productive investments in aquaculture (n). Target to achieve by 2023 is the number of 60 projects. With such a number of projects it is possible to combine the questionnaire survey and qualitative studies on the impact of investments on increasing the competitiveness of the fisheries and aquaculture sector.

5.4 Data resources and availability

Data necessary for assessing progress towards national target of the Europe 2020 strategy, and the characteristics of synergies between growth priorities, are specified at the project level (outputs) and at the regional and / or country level (the results, the impacts and context indicators). The basic sources of indicators for outcomes and results, as well as for socio-economic context are the Slovak Hydro-meteorological Institute, the Statistical Office of the Slovak Republic (SO SR) and Eurostat. Data and analysis are provided also by the Ministry of Environment and Slovak Environmental Agency. An additional important source of statistics are quantitative data and the Ministry

of Economy, as well as information from manufacturers and distributors of electricity and heat (Box 13).
The best and the most detailed covered area is perhaps production and distribution of energy, energy consumption in transport and in the industry. There are also extensive data available on sources and greenhouse gas emissions. Rather problematic are diffuse sources of emissions from households and quantification of energy savings, where only data at project level are available and we may operate with only proxy indicators, such as household consumption (which however, may be affected by many factors).
The key source of processed data and indicators is Enviroportál (information portal of the Ministry of the Environment). In clear and accessible form an important source of data for the evaluation of interventions.

Box 13 Selected indicators available for the energy and industry sectors

Production and consumption of energy	*Industrial Production*
Energy sector share of GDP Energy intensity of Slovak Rep. Economy Gross domestic energy consumption Final Energy Consumption Greenhouse gas emissions from energy Waste from energy production Emissions of key pollutants from power generation The price of electricity and natural gas Renewable energy sources	The industrial production index in manufacturing The share of manufacturing on GDP Final energy consumption in industrial production Emissions of key pollutants from industrial production Water consumption in industry Losses of land for industrial development Pollution by industrial waste water Industrial waste Greenhouse gas emissions from industrial processes and product use Expenditure on research and development in manufacturing The costs of environmental protection in industrial production

Source: Enviroportal.sk

The Gap Analysis of what data are available and what would need to be added, indicates relatively good sources of data available from the surveys of the Statistical Office, and the Hydro-meteorological Institute, as well as from measurement and research coordinated by Slovak Environmental Agency (SEA). SEA together with the Ministry of Environment operates enviroportal.sk website, which monitors and provides regular updates on development in virtually all key indicators. Monitoring system and data collection at the level of the projects is sophisticated and provides extensive data on each approved project. It would be appropriate to consider some options for improving both technical part of the work with data and information, as well as the proper scope and method of data collection for the projects.

One of the problems in statistical analysis what is the contribution of cohesion policy to energy savings is the fact, that many projects generating energy savings have several components. For example, in the reconstruction of schools and sanitary facilities, insulation is only one of the several activities. This makes it difficult in mapping precision investment levels in energy efficiency and to get completely accurate figures would require to investigate technical documentation of hundreds of projects. One solution could be that, similarly to the control of the financial side of the projects, there would be also check on the accuracy of data on energy consumption.

In addition, applicants should indicate data not only on the declared energy savings, but also on energy consumption for several years before, and after implementation of the project (eg. an obligation to provide these data to the operator of the monitoring system energy efficiency), while in the context of verification of the savings, the empirically measured savings are compared with the planned (declared) savings. A prerequisite for savings verification and analysis of the effectiveness of utilization of spent finances is division of financial flows (Grant, co-financing, own projects) to (a) the expenditures necessary to implement energy efficiency measures; and (b) for other expenses. So far, such a division is not possible within the ITMS, making it impossible to carry out such an analysis.

The current data collection system does not evaluate the cost-effectiveness of energy efficiency measures. It would be useful to monitor what is capital intensity of energy efficiency measures implemented in each OP, and analyse how the required quantitative objectives can be achieved in terms of economic costs. In this respect, positive change in the current programming period should occur through tracking finances that are directly related to energy saving. These should be monitored at project level and be linked with the monitoring of energy savings to SEIA.

An important part of the evaluation of sustainable growth in the context of the PA targets is analysis of secondary effects. One of the effects of investment in sustainable growth should be job creation and jobs created specifically through environmental investments (i.e. Green jobs). This will require a better definition of this category of jobs. In the same time it opens question, how to monitor and evaluate the jobs affiliated with the whole cycle of implementation and delivery of projects.

5.5 The Sustainable Growth: allocations to main targets and synergies

Operational Programme Quality Environment and ***Rural Development Programme*** were identified as programs that primarily contribute to the achievement of sustainable growth, while the amount of interventions is €3 921.3m (including technical assistance, see Table 9). OP QE contributes to the sustainable growth with the amount €3,138.1m (including technical assistance), RDP is investing in sustainable growth objectives at the level of €783.25m.

In the context of national targets for sustainable growth, the highest proportion of intervention one find at the 'Sustainable growth outside national targets' OPQE is

investing in this category €2,847.9m (priority axes 1-3) and RDP €672.4m. Within the OPQE, interventions into environmental infrastructure are planned (waste management, water management, air protection, biodiversity protection or flood control), although with no immediate / direct impact on the national targets for energy efficiency, emission reduction and renewable energy. This includes following areas of intervention:

The thematic areas 017; 018; 019 (household waste management, commercial, industrial or hazardous waste) is the amount of intervention €402.9m. Effects of interventions can be quantified by combining output and outcome indicators:

- for 017: Increased capacity - recycling - the share of recycled waste on the total waste;
- 018: The increased capacity for separated waste collection - Percentage of recycled waste to total amount of waste generated;
- for 019: Increased capacity for recovery of waste - Share of recycled waste in the total amount of the waste generated.

The thematic areas 020; 021; 022 (water supply for human consumption, water management and drinking water; sewage) is the amount invested €497.8m. Effects of interventions can be quantified by combining output and outcome indicators:

- for 020: The increased population with improved supply of drinking water - the population connected to public water supply;
- for 021: The number of supported objects in the monitoring network of surface and groundwater - monitoring of water bodies and its share in the total number of water bodies;
- for 022: The increased population with improved urban waste water treatment - Number of inhabitants connected to the collection and treatment of urban waste water.

The thematic areas 085 and 086 (Protection and enhancement of biodiversity, nature conservation and green infrastructure and protection, restoration and sustainable use of Natura 2000 sites) is the amount of intervention €150.6m. Effects of interventions can be quantified by combining output and outcome indicators:

- For the 085: area of habitats supported to achieve a better state of conservation - Number of habitats and species in favourable conservation conditions;
- for 086: Number of implemented elements of green infrastructure - Number of habitats and species in a favourable conditions.

The thematic areas 083, 084, 089 (measures to ensure air quality, integrated pollution prevention and control, reclamation of industrial sites and contaminated land) the amount invested is €390.5m. Effects of the interventions can be quantified by combining output and outcome indicators:

- For 083: low-emission power equipment installed replacing the obsolete combustion heat sources for heating - Production of particulate matter PM, or the number of medium and large stationary sources supported with the aim to reduce emissions - Emission production of selected pollutants;

- For 089: Total surface area of reclaimed land - Proportion of rehabilitated sites in the total number of registered sites with environmental liabilities in Slovakia.

The thematic area 087 (Action on climate change adaptation and risk prevention and management of climate-related events eg. erosion, fires, floods, storms and droughts, including awareness-raising, civil protection systems and infrastructures for disaster management) in PO 2 and PO 3 are combined allocation of €679.4m focused on flood control, while the effects of such interventions can be quantified by combining output and outcome indicators such as: population benefiting from flood protection measures - The number of people living in areas with the existence of flood risk, or the number of early warning systems - coverage ratio of populated areas with a system of security early warning.

The national goal of 'energy efficiency and reducing energy consumption' is financed by the OP QE and RDP with amount of €789,3m (investment priorities 4.2; 4.3; 4.4; 4.5). Interventions are directed to areas such as:

- 068 (Energy efficiency and demonstration projects for SMEs and support measures);
- 070 (Promotion of energy efficiency in large industries)
- 013 (restoration of public infrastructure to ensure energy efficiency demonstration projects and support measures); and
- 016 (High-efficiency cogeneration and district heating).

The effects of such interventions can be quantified by combining output and outcome indicators: the number of companies receiving support - Energy intensity or a reduction in final energy consumption in public buildings - Energy intensity of public buildings, or the number of realized information activities - Proportion of the population living in the area where there have been carried out awareness rising activities for low-carbon measures, or alternatively, 'amount of heat produced by high-efficiency cogeneration based on a useful heat demand' - the share of heat delivered to the total produced by cogeneration of heat supplied.
The OPQE contribution towards achieving national targets for renewable energy is relatively low, in the context of investment measures 4.1 there is plan to spent € 169m in 010 subject areas 010; 011; 012. Namely renewable energy - wind power, renewable energy - biomass; Other sources of renewable energy (including hydropower, geothermal energy and marine energy) and the integration of renewable energy sources (including the infrastructure for storage, converting electricity to gas and renewable hydrogen) . Effects of interventions can be seen in a combination of output and outcome indicators: Increased capacity of electricity from renewable sources - the share of RES in gross final energy consumption of the SR, or 'increase the production capacity of electricity from renewable sources - the share of RES in gross final energy SR consumption / installed capacity of small renewable energy facilities in households of Bratislava Region'.
Rural Development Programme invests in sustainable growth objectives, at the amount of €783.25m, while a substantial proportion of €672.4s is benchmarked for sustainable growth outside the national targets. Within this target, it invests especially to

priority 4, at the amount of €560.1m. The other sustainable growth targets such a CO_2 emissions reductions, are supported by RDP by €106.7m.

Table 9: The map of allocations by the OPQE and RDP in targets in the sustainable growth

Sustainable growth	Sustainable growth outside national targets	Energy efficiency and decreasing energy consumption	Cutting CO_2 emission	Renewable energy resources
OPQE 1.1	(017,018,019) €402.9m			
OPQE 1.2	(020,201,022) €497.8m			
OPQE 1.3	(085,086) €150.6m			
OPQE 1.4	(083,084,089) €390.5m			
OPQE 2.1	(087) €419.4m			
OPQE 3.1	(087) €260.9m			
OPQE 4.1				(010,011,012) €169m
OPQE 4.2		(068,070) €110m		
OPQE 4.3		(013) €351.4m*		
OPQE 4.4		(013) €123.5*		
OPQE 4.5		(016) €185m		
OPQE TA	(121-123) €53.4	(121-123) €19.4m		(121-123) €4.25m
RDP P2	(M8_2C) €16.6m			
RDP P3	(M05_3B) €56m			
RDP P4	(M01_4p+4l, M02_4p+4l, M04_4p, M08_4l, M11_4p, M12_4p+4l, M13_4p, M15_4l, M16_4p) €560.1m		(M10_4p) €106.7m	
RDP P5	(M01_5C, M01_5E, M02_5E, M04_5C, M06_5C, M08_5E, M16_5C) €14.25m			
RDP TA	(121-123) €25.4m		(121-123) €4.2m	
Total	**€2 847.9m**	**€789.3m**	**€110.9m**	**€173.25m**

Source: Financial plans by the operational programmes. Notes: (065) €51.2m = the intervention code and allocation in €m.

Note: The intervention field 013 allocates €474.9m and was subdivided in following way : the priority 4.3 received 74% and priority 4.4 26% of the total allocation. The subdivision is based on an division of allocation in the Ex ante evaluation of the Operational Programme Quality of Environment in programming period 2014 – 2020, page 60.

5.5.1 Synergies with the smart growth

Operational Programme Quality of Environment does not include allocations to areas of intervention related to smart growth. Rural Development Programme contributes to smart growth and to the item 'Smart Growth objectives not included in national targets' with the amount of €526m (including technical assistance). Allocations are directed to priority 2 (€262m) and Priority 3 (€244.6m). The interventions are implemented through the

activities of M01 (Knowledge transfer and information actions), M02 (advisory services, assistance in farm management and assistance to farms), M04 (capital expenditures), M06 (development of agricultural firms and business development) and M16 (Cooperation). Synergy effects of interventions can be measured by a combination of the following indicators:

- M01: Training / skills acquisition (1.1) - the number of projects, training / skills acquisition (1.1) - Total public expenditure on training / skills trainees, total public expenditure (in €) (training, farms exchange, demonstrations) (from 1.1 to 3.1);
- M02: Number of recipients who were subject to counselling (1.2) Total public expenditure in € (from 2.1 to 3.2)
- M04: Total investments (in €) (public + private) Total public expenditure (in €) Total public expenditure (in euros);
- M16: Number of agro-cultural fir involved in the collaboration / promotion among the local actors in the supply chain (4.16) Total public expenditure (in €) (from 1.16 to 9.16).

Table 10: The map of synergies between the sustainable and smart growths by codes of intervention fields

Sustainable growth	Interventions in smart growth outside national targets	Early school leavers	Population with the tertiary attainment	Share of GERD in GDP
RDP P2	(M01_2A, M01_2B, M01_2C+, M02_2A, M02_2B, M02_3C+, M04_2A, M04_2B,M04_C3+, M06_2A, M06_2B, M16_2A) €261.9m			
RDP P3	(M01_3A, M01_3B, M02_3A, M02_3B, M04_3A, M16_3A, M14_3A) 244.6m			
RDP TA	(121-123) €20m			
Total	**€526.5m**	**€0m**	**€0m**	**€0m**

Source: Financial plans by the operational programmes. Notes: (065) €51.2m = the intervention code and allocation in €m.

5.5.2 Synergies with the inclusive growth

Operational Programme Quality of Environment does not include direct allocations to areas of intervention related to the inclusive growth. In the case of the Rural Development Programme, there is allocation to the inclusive growth, not included on the national targets, in the amount of €173.2m (including technical assistance) and to the national target of increasing employment interventions amounting to €81. These synergies are related to the priority 2 (more information in Table 11).

Synergy effects of interventions can be measured by a combination of the following indicators:

- M01: Training / skills acquisition (1.1) - the number of training / skills acquisition (1.1) - Total public expenditure on training / skills trainees, total public expenditure (in €) (training, exchange holdings , demonstration) (from 1.1 to 1.3)
- M06: Total investments (in €) (public + private), Total public expenditures (in €), Total public expenditures (€)
- M7: Total public expenditure (in EUR) Total public expenditure in € (8.1)
- M16: Total public expenditures (in euros) (from 1.16 to 9.16);
- M19: The number of selected LAGs, Share of population covered by covers local action programs.

Total public expenditures (in €) - Preparatory support (19.1), Total public expenditures (in €) - Support for the implementation of operations under the strategy MRVK (19.2), Total public expenditure (in €) - preparation and implementation of cooperation activities of the local action group (19.3) Total public expenditure (in euros) - support for operational costs, and recovery (19.4).

Table 11: The map of synergies between the sustainable and inclusive growths by codes of intervention fields

Sustainable growth	Inclusive growth outside the national targets	Employment	Decreasing share of population at the risk of poverty or exclusion
RDP P6	(M01_6a, M01_6b, M06_6a, M07_6b, M07_6c, M16_6a) €166.6m	(M19_6b) €78.0m	
RDP TA	(121-123) €6.6m	(121-123) €3.1m	
Total	**€173.2m**	**€81.0m**	**€0.0m**

Source: Financial plans by the operational programmes. Notes: (073) €5.6m = the intervention code and allocation in €m.

6 Matrix of synergies for thematic objectives and priorities of growth

Table 12: The matrix of synergies by the thematic objectives, priorities of growth national targets of the EU 2020 Strategy

The EU 2020 targets / Investment priorities	SG O	SG 1	SG 2	SG3	SUG O	SUG4	SUG5	SUH 6	ING N	ING 7	ING 8	Total
TO1	212.0			1578.0		56.0	8.6					1854.6
TO2	823.6								86.6			910.2
TO3	893.9			26.9	71.1	28.1					5.8	1025.7
TO4					14.8	902.2		173.2				1090.2
TO5					697.4		111.0					808.3
TO6					2154.1							2154.1
TO7							1606.8			1972.7		3579.4
TO8	63.1									1268.6		1331.7
TO9		91.9			74.2				677.7	173.5	386.3	1403.6
TO10		338.5	87.7							322.2		748.3
TO11	278.5											278.5
Total	**2271.0**	**430.4**	**87.7**	**1604.9**	**3011.6**	**986.3**	**1726.4**	**173.2**	**764.3**	**3736.9**	**392.1**	**15184.8**

TO1 = Strengthening research, technological development and innovation, TO2 = Enhancing access to, and use and quality of information and communication technologies, TO3 = Enhancing the competitiveness of small and medium-sized enterprises (SMEs) (including EFARD) and the fishery and aquaculture sector (including EMFF), TO4 = Supporting the shift towards a low-carbon economy in all sectors, TO5 = Promoting climate change adaptation, risk prevention and management, TO6 = Preserving and protecting the environment and promoting resource efficiency, TO7 = Promoting sustainable transport and removing bottlenecks in key network infrastructures, TO8 = Promoting sustainable and quality employment and supporting labour mobility, TO9 = Promoting social inclusion, combating poverty and any discrimination, TO10 = Investing in education, training and vocational training for skills and lifelong learning, TO11 = Enhancing institutional capacity of public authorities and stakeholders and efficient public administration.

The matrix distributes also the proportional part of the technical assistance.

7 Matrix of synergies for operational programmes and priorities of growth

Matrixes headings:

SG O = Smart Growth outside the National Targets; SG 1 = dropout rates under 6%; SG 2 = tertiary education: 40%; SG 3 =Research and Development: GERD 1.2% GDP, SUG O = Sustainable Growth outside the National Targets; SUG 4 = Energy efficiency and decreasing energy consumption Mtoe; SUG 5 Cutting CO2 emission: 13%; SUG 6 Renewable resources: 14%; ING O = Inclusive Growth outside the National Targets; ING 7 = Employment rate: 72%; ING 8 = Decreasing share of population at the risk of poverty.

7.1 Matrix of synergies by intervention field

Table 13: The matrix of synergies by the operational programmes, priorities of growth national targets of the EU 2020 Strategy and output and intervention field

The EU 2020 targets / Investment priorities	SG O	SG 1	SG 2	SG3	SUG O	SUG4	SUG5	SUH 6	ING N	ING 7	ING 8	Total
OPRI 1.1				056,057,058,059,060			065					056,057,058, 059,060, 065
OPRI 1.2	001,004,063,066,067			002,061,062,064		069						001,004,063,066,067 002,061,062,064,069
OPRI 2.1				056,057,058,059,060			065					056,057,058, 059,060, 065
OPRI 2.2	001,063			002,061,062,064		069						001,063, 002,061,062,064, 069
OPRI 3,1	001,063			056,064		068,069					073	001,063, 056,064,068,069
OPRI 3.2	066,067											066,067
OPRI 3.3	076,077,082											076,077,082
OPRI 4.1	001,066,067,076,077			056		069						001,066,067, 076,077, 056,069
OPRI TA	121-123			121-123		121-123	121-123					121-123
OPHR 1.1		115										115
OPHR 1.2										118		118
OPHR 1.3			116									116
OPHR 1.4										117		117
OPHR 2.1										103		103
OPHR 3.1										102		102
OPHR 3.2										105		105
OPHR 3.3										108		108

OPHR 4.1										109		109
OPHR 4.2											112	112
OPHR 5.1		111									110	110,111
OPHR 6.1		052			017,020, 022				032,054, 101		055	052,017,020,055, 022,032,054,101
OPHR 6.2										073		073
OPHR TA		121-123	121-123		121-123				121-123	121-123	121-123	121-123
OPQE 1.1					017,018,019							017,018,019
OPQE 1.2					020,021,022							020,021,022
OPQE 1.3					085,086							085,086
OPQE 1.4					083,084,089							083,084,089
OPQE 2.1					087							087
OPQE 3.1					087							087
OPQE 4.1								010,011,012				010,011,012
OPQE 4.2								068,070				068,070
OPQE 4.3								013 (74%)				013 (74%)
OPQE 4.4								013 (26%)				013 (26%)
OPQE 4.5								016				016
OPQE TA					121-123			121-123				121-123
IROP 1.1										031,034		031,034
IROP 1.2							043,044,090					043,044,090
IROP 2.1									055,053			055,053
IROP 2.2										050,051		050,051

IROP 3.1	066, 067									072,076,077		066, 067,072,076,077
IROP 4.1						014						014
IROP 4.2					020,022							020,022
IROP 4.3					085							085
IROP 5.1											097	097
IROP TA	121-123				121-123	121-123	121-123		121-123	121-123	121-123	121-123
OPII PA1 7i							024					024
OPII PA1 7iii							027					027
OPII PA2 7i										028,044		028,044
OPII PA3 7ii							026,043					026,043
OPII PA4 7i							041					041
OPII PA5 7d							025,026					025,026
OPII PA6 7a										029,044		029,044
OPII PA6 7b										031,034		031,034
OPII PA7 2a	045, 046,048											045, 046,048
OPII PA7 2b	082											082
OPII PA7 2c	078,079,080,081											078,079,080,081
OPII TA	121-123						121-123			121-123		121-123
OPEPA 1.1	119											119
OPEPA 2.1	119											119
OPEPA TA	121-123											121-123

RDP P2	M01_2A, M01_2B, M01_2C+, M02_2A, M02_2B, M02_3C+, M04_2A, M04_2B,M04_C3+, M06_2A, M06_2B, M16_2A				M8_2C							M01_2A, M01_2B, M01_2C+, M02_2A, M02_2B, M02_3C+, M04_2A, M04_2B,M04_C3+, M06_2A, M06_2B, M16_2A, M8_2C
RDP P3	M01_3A, M01_3B, M02_3A, M02_3B, M04_3A, M16_3A, M14_3A				M05_3B							M01_3A, M01_3B, M02_3A, M02_3B, M04_3A, M16_3A, M14_3A M05_3B
RDP P4					M01_4p+4l, M02_4p+4l, M04_4p, M08_4l, M11_4p, M12_4p+4l, M13_4p, M15_4l, M16_4p		M10_4p					M01_4p+4l, M02_4p+4l, M04_4p, M08_4l, M11_4p, M12_4p+4l, M13_4p, M15_4l, M16_4p, M10_4p
RDP P5					M01_5C, M01_5E, M02_5E, M04_5C, M06_5C, M08_5E, M16_5C							M01_5C, M01_5E, M02_5E, M04_5C, M06_5C, M08_5E, M16_5C

RDP P6									M01_6a, M01_6b, M06_6a, M07_6b, M07_6c, M16_6a	M19_6b		M01_6a, M01_6b, M06_6a, M07_6b, M07_6c, M16_6a, M19_6b
RDP TA	121-123				121-123		121-123		121-123	121-123		121-123
OPF ST 2.2	(Art. 13(2)											(Art. 13(2)
OPF ST 2.3	(Art. 13(2)				(Art. 13(2)							(Art. 13(2), (Art. 13(2)
OPF ST 3.1	Art. 13 par. 3											Art. 13 par. 3
OPF ST 3.2	(Art. 76 (2)(a) to (d) a (f) to (j)) (Art. 13(3)											(Art. 76 (2)(a) to (d) a (f) to (j)) (Art. 13(3)
OPF ST 5.1	(Art. 13(2)											(Art. 13(2)
OPF ST 5.2	(Art. 13(2)											(Art. 13(2)
OPF TA	(Art. 13(2)											(Art. 13(2)

7.2 The matrix of synergies by financial allocations

Table 14: The matrix of synergies by the operational programmes, priorities of growth national targets of the EU 2020 Strategy and financial allocations

The EU 2020 targets / Investment priorities	SG O	SG 1	SG 2	SG3	SUG O	SUG4	SUG5	SUH 6	ING N	ING 7	ING 8	Total
OPRI 1.1				856.43			6.23					862.66
OPRI 1.2	199.42			538.11		51.24						788.77
OPRI 2.1				119.83			2.13					121.96
OPRI 2.2	6.00			14.92		1.42						22.33
OPRI 3.1	118.21			25.07		24.40					5.60	173.28
OPRI 3.2	176.54											176.54
OPRI 3.3	26.60											26.60
OPRI 4.1	21.67			0.99		1.98						24.63
OPRI TA	17.48			49.56		2.52	0.27				0.18	70.00
OPHR 1.1		221.45										221.45
OPHR 1.2										97.67		97.67
OPHR 1.3			84.55									84.55
OPHR 1.4										55.07		55.07
OPHR 2.1										194.35		194.35
OPHR 3.1										694.42		694.42
OPHR 3.2										66.50		66.5
OPHR 3.3										35		35.00
OPHR 4.1										152.21		152.21
OPHR 4.2											142.48	142.48
OPHR 5.1		40									99	139
OPHR 6.1		50.05			41.27				106.48		30.81	228.61
OPHR 6.2										15.05		15.05
OPHR TA		10.04	3.13		2.03				4.57	48.43	10.40	78.6
OPQE 1.1					402.88							402.88
OPQE 1.2					497.84							497.84
OPQE 1.3					150.60							150.6
OPQE 1.4					390.45							390.45
OPQE 2.1					419.35							419.35
OPQE 3.1					260.90							260.9
OPQE 4.1								168.98				168.98

OPQE 4.2						110.00						110.00
OPQE 4.3						351.42						351.42
OPQE 4.4						123.47						123.47
OPQE 4.5						185.00						185.00
OPQE TA					53.38	19.37		4.25				77
IROP 1.1										298		298
IROP 1.2							123					123
IROP 2.1									492.91			492.91
IROP 2.2		105								158		263
IROP 3.1	60.9									154.96		215.86
IROP 4.1						111.39						111.39
IROP 4.2					55							55
IROP 4.3					33.33							33.33
IROP 5.1											100	100
IROP TA	2.23	3.85			3.24	4.08	4.51		18.06	22.38	3.66	62
OPII PA1 7i							545.84					545.84
OPII PA1 7iii							180.00					180.00
OPII PA2 7i										1 142.5		1 142.5
OPII PA3 7ii							322.31					322.31
OPII PA4 7i							116.45					116.45
OPII PA5 7d							282.23					282.23
OPII PA6 7a										175.42		175.42
OPII PA6 7b										309.33		309.33
OPII PA7 2a	277.75											277.75
OPII PA7 2b	10.00											10.00
OPII PA7 2c	517.76											517.76
OPII TA	18.06						32.45			36.49		87.00
OPEPA 1.1	234.1											234.1
OPEPA 2.1	33.21											33.21
OPEPA TA	11.14											11.14
RDP P2	261.86				16.58							278.43
RDP P3	244.63				51.95							296.58
RDP P4					560.09		106.73					666.83
RDP P5					14.25							14.25

RDP P6									166.56	77.98		244.54
RDP TA	20.01				25.4		4.22		6.58	3.08		59.29
OPF ST 2.2	7.24											7.24
OPF ST 2.3					2.17							2.17
OPF ST 3.1	0.7											0.7
OPF ST 3.2	0.7											0.7
OPF ST 5.1	2.02											2.02
OPF ST 5.2	2.02											2.02
OPF TA	0.8				0.14							0.94
Total	**2 271.05**	**430.39**	**87.6**	**1 604.91**	**3011.6**	**986.29**	**1 726.37**	**173.2**	**764.3**	**3 736.84**	**392.1**	**15 184.8**

7.3 The matrix of synergies by output and result indicators

Table 15: The matrix of synergies by the operational programmes, priorities of growth national targets of the EU 2020 Strategy and output and results indicators

The EU 2020 targets / Investment priorities	SG O	SG 1	SG 2	SG3	SUG O	SUG4	SUG5	SUH 6	ING N	ING 7	ING 8
OPRI 1.1				(056-060): R0126/R0042/ R0126 - CO01			(065): O0070 - R0126				
OPRI 1.2	(001 a 0040): CO27 - R0044; (063): O0076 - R0046; (066): CO04 - R0046; (067): O0074 - R0046			(002; 061; 062; 064): CO01 - R0044/R0045		(069): CO01 - R0046					
OPRI 2.1				(056-060: R0126/R0042/ R0126) - CO01			(065): O0070 - R0126				
OPRI 2.2	(001): CO27 - R0045;(063): O0076 - R0046 /R0047; (066): CO04 - R0047; (067): O0074 - R0047			(002; 061; 062; 064): CO01 - R0044/R0045		(069): CO01 - R0047					
OPRI 3.1	(001): CO03 - R0048; (063): O0076 - R0048			(056): CO28 - R0048 ; (064): CO03 - R0048		(068 a 069): CO01 - R0048					(073): O0078 - R0048
OPRI 3.2	(066): CO04 - R0049; (067): O0074 - R0049										
OPRI 3.3	(076 a 077): O0084 - R0050; (082): O0083 - R0050										

OPRI 4.1	(001): CO03 - R0130; (066): CO04 - R0130; (067): O0074 - R0130; (076 a 077): O0084 - R0130			(056): CO03 - R0130		(069): CO01 - R0130					
OPRI TA											
OPHR 1.1		(115): O0072: - R0069									
OPHR 1.2										(118): R0076 - O0076	
OPHR 1.3			(116): R0081 - O0077								
OPHR 1.4										(117): R0085: - O0082	
OPHR 2.1										(103): CR01- O0085	
OPHR 3.1										(102): CR04- R0089	
OPHR 3.2										(105): O0087 - R0092	
OPHR 3.3										(108): R0097 - O0091	
OPHR 4.1										(109): RR0098 - O0094	

OPHR 4.2											(112) O0098 - CO22
OPHR 5.1		(111): R0105/R0106 – CO09/O0103									(110) R0107/ R0108/ R0109
OPHR 6.1		(052): R0146 - O0195/O0197			(017, 022): O0194 - R0144; (020): CO18 - R0145; O0196 - R0147				(032, 054 a 101): O0194-R0144		(055): R0147 - O0196/O0198
OPHR 6.2										(073): R0148: - CO08	
OPHR TA											
OPQE 1.1					(017): CO17 - R0001; (018): CO002 - R0001; (019): C0003 - R0001						
OPQE 1.2					(020): CO18 - R0003; (021): O006 – R0004; (022): CO 19 - R0120;						
OPQE 1.3					(085): CO23 - R006, (086): O0010 - R0006						
OPQE 1.4					(083): O0174 - R0122; O0177 - R0123; (089): CO22 - R0009						

OPQE 2.1					(087): CO20 - R0010						
OPQE 3.1					(087): O0023 - R0012						
OPQE 4.1								(012): O0188 - R0015; (010-012): O0188 - R0015/R0115			
OPQE 4.2						(068): CO01 - R0114 ; (070): CO01- R0114					
OPQE 4.3						(013): O0187 - R0124					
OPQE 4.4						(013): O01778 - R0125					
OPQE 4.5						(016): O0039 - R0121					
OPQE TA											
IROP 1.1										(031): C013 - R0113 ; (034): C014 - R0113	

IROP 1.2							(090): O0128 - R0157; (044): R0164 - O0134; 043: O0219 - R0156				
IROP 2.1									(055): R0091 - O0250; (053): R0093 - C036		
IROP 2.2		052: R0096 – O0226								(050): R0166 - O0147/O 0229; (051): R0097/R 0098 - O0227	
IROP 3.1	(067): R0160 - O0248; (066): R0160 - C001									(072,076, 077): R0160 - CO08	
IROP 4.1						(014): R0169 - O0255					
IROP 4.2					(020): R0003 - C018; (022): R0120 - C019						
IROP 4.3					(085): R0105- O0155/C038						

IROP 5.1											(097): R0168 - CO008
IROP TA											
OPII PA1 7i							(119): CO12a – R0053				
OPII PA1 7iii							(027): R0053 – R0131/ R0055				
OPII PA2 7i										(028, 044): R0118 – CO13a	
OPII PA3 7ii							(026, 043): R0058 – CO15/O 0190				
OPII PA4 7i							(041): R0060 – O0191				
OPII PA5 7d							(025, 026): R0061- CO12				
OPII PA6 7a										(029, 044): R0063 – CO13a	

OPII PA6 7b										(031, 034): R0063 – CO13/CO 14	
OPII PA7 2a	(045,046,048): R0069 – R0070/CO10										
OPII PA7 2b	(082): R0071 – O0160										
OPII PA7 2c	(078): R0074/R0076 – O0108/O0111; (079): R0077 – O0114; (80): R0079 – O0116; (81): R0078 – O0116										
OPII TA											
OPEPA 1.1	119: O0050 - R0049										
OPEPA 2.1	(119): O0063 - R0059										
OPEPA TA											
RDP P2*	M01, M02, M04, M06, M16				M08						
RDP P3*	M01, M02, M04, M14, M16				M05						
RDP P4*					M01, M02, M04, M08, M011, M12, M13, M15, M16		M10				
RDP P5*					M01, M02, M04, M06, M08, M16						
RDP P6*									M01	M19	
RDP TA											
OPF ST 2.2	CO05 – CR08, CR07, CR06, R0006, R0007, R0005, R0004										

OPF ST 2.3					CO05 – CR07						
OPF ST 3.1	CO04 – CR02										
OPF ST 3.2	CO03-CR01										
OPF ST 5.1	CO04-R0003										
OPF ST 5.2	R0002/R0001 – CO01										
OPF TA											

*

* - - Notes

M01: Knowledge transfer and information actions (1.1.) – Numbers; Professional training / learning skills (1.1.) – total public expenditure on professional training / learning skills by trainees. Total public investment (EUR) (professional training, exchange of agricultural businesses, demonstration activities) (1.1. to 1.3.).

M02: Advisory services, farm management and farm relief services (2.1.) Total public investment (EUR) (2.1 to 2.3)

M04: Total investments in physical assets (EUR) (public + private), Total public investment (EUR),

M06: Total investments in farm and business development, Total investments (EUR) (public + private), Total public investment (EUR),

M07: Basic services and village renewal in rural areas, Total public investment (EUR), Total public investment (EUR) (8.1)

M08: Basic services and village renewal in rural areas Total public investment (EUR) (8.4), Total public investment (EUR) (8.5), Total public investment (EUR) (8.6)

M10: Agro-environment-climate Area (hectares) within the agro-environmental-climatic support measure (10.1.), Total public investment (EUR)

M11: Organic farming, Area (hectares) – transition to the eco-farming (11.1.), Area (hectares)– further development of the eco-farming (11.1.), Total public investment (EUR), Area (hectares).

M12: Natura 2000 and Water Framework Directive payments Area (hectares) – forest area in the NATURA 2000 System (12.2.). Total public investment (EUR)

M13: Payments to areas facing natural or other specific constraints, Area (hectares)– mountain areas (13.1.), Area (hectares)–other areas with significant nature limits (13.2.), Area (hectares) – areas with significant nature limits (13.3.), Total public investment (EUR)

M16: Co-operation. Numbers of agricultural enterprises participating in co-operation / local promotion between members of the supplier chain (16.4.). Total public investment (EUR) (16.1 to 16.9).

M19: Support for LEADER local development Number of selected local action groups (LAG), numbers of inhabitants covered by the LAG; Total public investment (EUR) – support / promotion (19.1), Total public investment (EUR) – support to implementing operation under the Strategy of community-led local development 19.2), Total public investment (EUR) – preparation and implementation of co-operation by the LAG (19.3), Total public investment (EUR) – support to current costs and revitalisation (19.4).

7.4 The matrix of synergies by Commission's recommendations

The table below present intersection between the (a) national targets set by the Europe 2020 Strategy and Council's broad guidelines in columns and (b) investment priorities in rows. The broad guidelines on economic policies were adopted by the Council Recommendation 2015/1184 of 14 July 2015 and Council Recommendation of 27.4.2010

Each broad recommendation has its unique intersection with the combination of investment priority and national target. The intersection was identified via logical relations between the text of broad guidelines and contents of the national targets and investment priorities.

Table 16: The matrix of synergies by the operational programmes, growth priorities, national targets of the Europe 2020 Strategy and Commission's recommendations

The EU2020 targets / Investment priorities	SG O	SG 1	SG 2	SG3	SUG O	SUG4	SUG5	SUH 6	ING N	ING 7	ING 8
OPRI 1.1				BG2			BG3				
OPRI 1.2	BG2			BG2		BG3					
OPRI 2.1				BG2			BG3				
OPRI 2.2	BG2			BG2		BG3					
OPRI 3,1	BG2			BG2		BG3					G10
OPRI 3.2	BG2										
OPRI 3.3	BG2										
OPRI 4.1	BG2			BG2		BG3					
OPRI TA											
OPHR 1.1		G9									
OPHR 1.2										G8	
OPHR 1.3			G9								
OPHR 1.4										G8	
OPHR 2.1										G7	
OPHR 3.1										G7	
OPHR 3.2										G7	
OPHR 3.3										G7	
OPHR 4.1										G7	
OPHR 4.2											G10
OPHR 5.1		G9									G10
OPHR 6.1		G9			BG3				G10		G10
OPHR 6.2										G7	
OPHR TA											
OPQE 1.1					BG3						
OPQE 1.2					BG3						
OPQE 1.3					BG3						
OPQE 1.4					BG3						
OPQE 2.1					BG3						
OPQE 3.1					BG3						
OPQE 4.1								BG3			
OPQE 4.2						BG3					
OPQE 4.3						BG3					
OPQE 4.4						BG3					
OPQE 4.5						BG3					
OPQE TA											
IROP 1.1										BG3	
IROP 1.2							BG3				
IROP 2.1									G10		
IROP 2.2		G9								G7	
IROP 3.1	G8									G8	
IROP 4.1						BG3					
IROP 4.2					BG3						
IROP 4.3					BG3						
IROP 5.1											G10
IROP TA											
OPII PA1 7i							BG3				

OPII PA1 7iii							BG3				
OPII PA2 7i										BG3	
OPII PA3 7ii							BG3				
OPII PA4 7i							BG3				
OPII PA5 7d							BG3				
OPII PA6 7a										BG3	
OPII PA6 7b										BG3	
OPII PA7 2a	BG2										
OPII PA7 2b	BG2										
OPII PA7 2c	BG2										
OPII TA											
OPEPA 1.1	BG2										
OPEPA 2.1	BG2										
OPEPA TA											
RDP P2	BG2				BG2						
RDP P3	BG2				BG2						
RDP P4					BG2		BG3				
RDP P5					BG2						
RDP P6									G10	G10	
RDP TA											
OPF ST 2.2	BG2										
OPF ST 2.3					BG3						
OPF ST 3.1	BG2										
OPF ST 3.2	BG2										
OPF ST 5.1	BG2										
OPF ST 5.2	BG2										
OPF TA											

Notes:

BG1: Broad Guideline 1: Promoting investment
BG2: Broad Guideline 2: Enhancing growth through Member States' implementation of structural reforms
BG3: Broad Guideline 3: Removing key barriers to sustainable growth and jobs at Union level
BG4: Broad Guideline č. 4: Improving the sustainability and growth-friendliness of public finances
G7: Guideline 7: Increasing labour market participation and reducing structural unemployment
G8: Guideline 8: Developing a skilled workforce responding to labour market needs, promoting job quality and lifelong learning
G9: Guideline 9: Improving the performance of education and training systems at all levels and increasing participation in tertiary education
G10: Guideline 10: Promoting social inclusion and combating poverty

8 List of abbreviations, figures and tables

8.1 List of abbreviations

BERD	Business expenditure on research and development
COLSAF	Central Office of the Labour, Social Affairs and Family
DEA	Data Envelopment Analysis
ERDF	European Regional Development Fund
ESF	European Social Fund
ESIF	European Structural Funds and Investment
EU	European Union
GERD	Gross expenditure on research and development
GO SR	Government Office of the Slovak Republic
GDP	Gross domestic product
HTU	Higher territorial unit
ICT	Information and Communication Technologies
ISCED	The International Standard Classification of Education
IP	Investment Priority
IROP	Integrated Regional Operational Programme
IT	Information Technology
ITMS	IT monitoring system
KEGA	The Culture and Education Grant Agency
MARD SR	Ministry of Agriculture and Rural Development
MESRS	Ministry of Education, Science, Research and Sports
MLSAF SR	Ministry of Labour, Social Affairs and Family of the Slovak Republic
OPBK	Operational Programme Bratislava Region
OPCEG	Operational Programme Competitiveness and Economic Growth
OPEPA	Operational Programme Efficient Public Administration
OPHR	Operational Programme Human Resources
OPF	Operational Programme Fisheries
OPII	Operational Programme Integrated Infrastructure
OPQE	Operational Programme Quality of Environment
OPRD	Operational Programme Research and Development
OPRI	Operational Programme Research and Innovation
PA SR	Partnership Agreement Slovak Republic
PPP	Purchasing Power Parity
R&D	Research and Development
RDP	Rural Development Programme
ROP	Regional Operational Programme
SCSTI	Slovak Centre for Scientific and Technical Information
SF and CF	Structural and Cohesion Funds
SIEA	Slovak Innovation and Energy Agency
SOSR	Statistical Office of the Slovak Republic
SRDA	Slovak Research and Development Agency

TFP	Total Factor Productivity

8.2 List of the operational programmes, priority axes and investment priorities

Operational Programme Research and Innovations

Priority Axis 1: Support to Research and Innovations

1.1 Enhancing research and innovation infrastructure and capacities to develop research and innovation excellence, and promoting centres of competence, in particular those of European interest.

1.1.1 Increasing the R&D system performance through horizontal support of technology transfer and ICT.

1.1.2 Promoting the participation of the SR in international cooperation projects.

1.1.3 Enhancing research activity through better coordination and consolidation of the R&D potential of research institutions.

1.2 Promoting business investment in research and innovation, and developing links and synergies between enterprises, research and development centres and the higher education sector, in particular promoting investment in product and service development, technology transfer, social innovation, eco-innovation, public service applications, demand stimulation, networking, clusters and open innovation through smart specialisation, and supporting technological and applied research, pilot lines, early product validation actions, advanced manufacturing capabilities and first production, in particular in key enabling technologies and diffusion of general purpose technologies.

1.2.1 Increasing private investments through cooperation between research institutions and the business sector.

1.2.2 Enhancing research, development and innovation capacities in industry and services.

Priority Axis 2 Support to Research and Innovations in the Bratislava Region

2.1 Enhancing research and innovation infrastructure and capacities to develop research and innovation excellence, and promoting centres of competence, in particular those of European interest.

2.1.1 Enhancing the research activity of the Bratislava Self-Governing Region through revitalisation and fostering of research, education, innovation, and business capacities of research institutions in Bratislava.

2.2 Promoting business investment in research and innovation, and developing links and synergies between enterprises, research and development centres and the higher education sector, in particular promoting investment in product and service development, technology transfer, social innovation, eco-innovation, public service applications, demand stimulation, networking, clusters and open

innovation through smart specialisation, and supporting technological and applied research, pilot lines, early product validation actions, advanced manufacturing capabilities and first production, in particular in key enabling technologies and diffusion of general purpose technologies.

2.2.1 Increasing private investments by building research and development centres in Bratislava.

2.2.2 Enhancing research, development and innovation capacities in industry and services in the Bratislava Region.

Priority Axis 3 Enhancing the competitiveness and growth of SMEs

3.1 Promoting entrepreneurship, in particular by facilitating the economic exploitation of new ideas and fostering the creation of new firms, including through business incubators.

3.1.1 Enhancing the growth of new competitive SMEs.

3.2 Developing and implementing new business models for SMEs, in particular with regard to internationalisation.

3.2.1 Growing internationalisation of SMEs and increased use of the possibilities offered by the EU Single Market.

3.3 Supporting the creation and the extension of advanced capacities for product and service development.

3.3.1 Increasing SME competitiveness at their development phase.

Priority Axis 4 Developing competitive SMEs in the Bratislava Region

4.1 Supporting the capacity of SMEs to grow in regional, national and international markets, and to engage in innovation processes.

4.1.1 Increasing the share of profit-making SMEs in the Bratislava region.

Technical assistance

The Operational Programme Human Resources

Priority Axis 1 Education

1.1 Reduction and prevention of early school dropouts and support for access to quality pre-school, elementary and secondary education including formal, informal and common methods of education with a view to re-inclusion in education and training.

1.1.1 Increasing inclusivity and equal access to quality education and improving results and competences of children and students.

1.2 Improving the labour market relevance of education and training systems, facilitating the transition from education to work, and strengthening vocational education and training systems and their quality, including through mechanisms for skills anticipation, adaptation of curricula and the establishment and development of work-based learning systems, including dual learning systems and apprenticeship schemes.

1.2.1 Improving the quality of vocational education and training while reflecting the labour market needs.

1.3 Increase the quality of tertiary education and development of human resources in the area of research and development with a view to establishing a link between tertiary education and the needs of the labour market.

1.3.1 Increase the quality of tertiary education and development of human resources in the area of research and development with a view to

establishing a link between tertiary education and the needs of the labour market.

1.4 Enhancing equal access to lifelong learning for all age groups in formal, non-formal and informal settings, upgrading the knowledge, skills and competences of the workforce, and promoting flexible learning pathways including through career guidance and validation of acquired competences.

1.4.1 Improving the quality and effectiveness of lifelong learning with an emphasis on the development of core competences and enhancing and upgrading skills.

Priority Axis 2 Youth Employment Initiative

2.1 Sustainable integration into labour market of young people, in particular those not in employment, education or training, including young people at risk of social exclusion and young people from marginalized communities, including through the implementation of the Youth Guarantee.

2.1.1 Increasing the employment, employability and participation of young unemployed people, NEET, in the labour market by introducing the youth guarantee.

Priority Axis 3 Employment

3.1 Access to employment for job-seekers and inactive people, including the long-term unemployed and people far from the labour market, also through local employment initiatives and support for labour mobility.

3.1.1 Increase employment, employability, and reduce unemployment with special emphasis on the long-term unemployed, low-qualified, elderly, and disabled persons.

3.1.2 Improving the access to the labour market using efficient tools to support employment, including supporting mobility for finding a job, self-employment, and activities in rural areas.

3.2 Equality between men and women in all areas, including in access to employment, career progression, reconciliation of work and private life and promotion of equal pay for equal work.

3.2.1 Increase the employment of persons with parental duties, especially women, by improving the conditions for alignment of work and family lives.

3.2.2 Reduce the horizontal and vertical gender segregation in the labour market and vocational training.

3.3 Modernisation of labour market institutions such as public and private employment services and improving of the matching labour market needs, including through actions that enhance transnational labour mobility, as well as through mobility schemes and better cooperation between institutions and relevant stakeholders.

3.3.1 Increasing the quality and capacity of public employment services to the corresponding level in relation to the changing needs and requirements of the labour market, multinational work mobility, and increasing the participation of partners and private employment services on the solution of problems in the area of employment.

Priority Axis 4 Social inclusion

4.1 Active inclusion, including with a view to promoting equal opportunities and active participation, and improving employability.

4.1.1 Increased participation of most disadvantaged and endangered persons in the society, including the labour market.

4.1.2 Preventing and eliminating of all forms of discrimination

4.2 Enhancing access to affordable, sustainable and high-quality services, including health care and social services of general interest

4.2.1 Supporting transition from institutional to community-based care

4.2.2 Create standard clinical procedures and standard procedures for the performance of prevention, and include them in the nationwide system of health care

Priority Axis 5: Integration of marginalized Roma communities

5.1 Socio – economic integration of marginalized communities, such as the Roma

5.1.1 Enhancing the educational level of members of marginalized communities, including, without limitation, the Roma, at all levels of education with an emphasis on pre-primary education

5.1.2 Increasing financial literacy, employability and employment of marginalized communities, especially the Roma

5.1.3 Promoting access to health care and public health, including preventive care and health education and increased hygiene standards of living

Priority Axis 6 Technical facilities in municipalities with presence of marginalized Roma communities

6.1 Providing support for physical, economic and social regeneration of deprived communities in urban and rural areas

6.1.1 Growth in the number of the Roma households with access to improved housing conditions

6.1.2 Improving access to quality education, including education and care in early childhood

6.1.3 Improving access of people from MRC to social infrastructure

6.2 Support for social enterprises

6.2.1 Increasing the employment of MRC in social economy entities in areas with the presence of MRC

Technical assistance

Operational Programme Quality of Environment

Priority Axis 1 Sustainable use of natural through environmental infrastructure development

1.1 Investing in the waste sector to meet the requirements of the Union's environmental acquis and to address needs, identified by the Member States, for investment that goes beyond those requirements

1.1.1 Increasing waste recovery rate with focus on preparation of waste for re-use and recycling and promotion of waste prevention

1.2 Investing in the water sector to meet the requirements of the Union's environmental acquis and to address needs, identified by the Member States, for investment that goes beyond those requirements

1.3 Protecting and restoring biodiversity and soil and promoting ecosystem services, including through Natura 2000, and green infrastructure

1.3.1 Improving conservation status of habitats and species and strengthening of biodiversity mainly in Natura 2000 network

1.4 Taking action to improve the urban environment, to revitalise cities, regenerate and decontaminate brownfield sites (including conversion areas), reduce air pollution and promote noise-reduction measures

1.4.1 Reducing air pollution and improving air quality

1.4.2 Ensuring remediation of environmental burdens in urban environment as well as in abandoned industrial sites (including conversion areas)

Priority Axis 2 Adaptation to the adverse effects of climate change with the focus on flood protections

2.1 Supporting investment for adaptation to climate change including ecosystem - based approaches

Reducing the risk of flooding and negative effects of climate change

Improving the effectiveness of remediation, revitalization and safeguarding of extractive waste repositories

Priority Axis 3 Promoting risk management, emergency management and resilience to emergencies affected by climate change

3.1 Promoting investment to address specific risks, ensuring disaster resilience and developing disaster management systems

3.1.1 Increasing the level of preparedness to manage emergencies affected by climate change

3.1.2 Increasing the effectiveness of preventive and adaptation measures to eliminate environmental risks (except for flood protection measures)

3.1.3 Increasing the effectiveness of management of emergencies affected by climate change

Priority Axis 4 Energy efficient low-carbon economy in all sectors

4.1 Promoting the production and distribution of energy derived from renewable sources

4.1.1 Increasing the share of RES in gross final energy consumption of the SR

4.1.2 Increase of installed capacity of RES-based small-scale installations in the Bratislava self-governing region

4.2 Promoting energy efficiency and renewable energy use in enterprises

4.2.1 Reduction of energy intensity and increasing the use of RES in enterprises

4.3 Supporting energy efficiency, smart energy management and renewable energy use in public infrastructure, including in public buildings, and in the housing sector

4.3.1 Reduction of energy consumption in the operation of public buildings

4.4 Promoting low-carbon strategies for all types of territories, in particular for urban areas, including the promotion of sustainable multimodal urban mobility and mitigation-relevant adaptation measures

4.4.1 Increasing the number of local plans and measures related to the low-carbon strategy for all types of territories

4.5 Promoting the use of high-efficiency co-generation of heat and power based on useful heat demand

4.5.1 Development of more efficient district heating systems based on useful heat demand

Technical assistance

Integrated Regional Operational Programme

Priority Axis 1 Safe and environmentally-friendly transport in regions

1.1 Enhancing regional mobility through connecting secondary and tertiary nodes to TEN-T infrastructure, including multimodal nodes

1.1.1 Improvement of traffic accessibility to TEN-T infrastructure and 1st class roads with the emphasis on the development of multimodal transport system.

1.2 Development and improving environmentally-friendly including low-noise and low-carbon transport systems, including inland waterways and maritime transports, ports, multimodal links and airport infrastructure, in order to promote sustainable regional and local mobility

1.2.1 Increasing the attractiveness and competitiveness of public passenger transport

1.2.2 Enhancing the attractiveness and capacity of non-motorized transport (mainly the bicycle transport) to the total amount of transported passengers.

Priority Axis 2 Easier access to effective and quality public services

2.1 Investing in health and social infrastructure which contribute to national, regional and local development, reducing inequalities in terms of health status, promoting social inclusion through improved access to social, cultural and recreational services and the transition from institutional to community-based services

2.1.1 To facilitate the transition of social services and socio-legal protection of children and social guardianship in institutions from institutional to community-based form and to support the development of child care services for children below three years of age at the community level

2.1.2 Modernising health care infrastructure for the purpose of primary health care integration.

2.1.3 Modernising of infrastructure of institutional facilities providing acute health care for the purpose of increase of their productivity and effectiveness

2.2 Investing in education, training and vocational training, skills and lifelong learning by developing education and training infrastructure

2.2.1 Increase of gross school readiness of children in kindergartens

2.2.2 Improvement of key competences of pupils in primary schools

2.2.3 Increase number of students in secondary vocational schools in practical education

Priority Axis 3 Mobilizing creative potential in the regions

3.1 Supporting employment-friendly growth through the development of endogenous potential as part of a territorial strategy for specific areas, including the conversion of declining industrial regions and enhancement of accessibility to, and development of, specific natural and cultural resources

3.1.1 Stimulating the promotion of sustainable employment and job creation in the cultural and creative industry by creating a conducive environment for the development of creative talent and non-technological innovation.

Priority Axis 4 Improving the Quality of Life in Regions with an Emphasis on the Environment

4.1 Supporting energy efficiency, smart energy management and renewable energy use in public infrastructure including in public buildings and in the housing sector

4.1.1 Enhancing energy efficiency of residential build

4.2 Investing in the water sector to meet the requirements of the Union's environmental acquis and to address needs, identified by the Member States, for investment that goes beyond those requirements

4.2.1 Increasing the share of population with improved drinking water supply and drainage and treatment of waste waters by public sewerage without any negative impacts on the environment

4.3 Taking actions to improve the urban environment, to revitalize cities, regenerate and decontaminate brownfield sites (including conversion areas), reduce air pollution and promote noise-reduction measures

4.3.1 Improving the environmental aspects of urban and metropolitan areas through the construction of green infrastructure elements and through the adaptation of urban environment to the climate change as well as the introduction of system elements reducing air pollution and noise

Priority Axis 5 Community-Led Local Development

5.1 Undertaking investments in the context of community- led local development strategies

5.1.1 Increase employment at local level by development of entrepreneurships and innovations

5.1.2 Improvement of sustainable relations between rural development centres and their background in public services and in public infrastructures

Technical assistance

Operational Programme Integrated Infrastructure

Priority Axis 1 Railway infrastructure (TEN-T CORE) and renewal of rolling stock

7i) Support to multimodal single European space via investment to the TEN-T

1.1 Removal of key bottlenecks in railway infrastructure via modernisation and development of main railways and hubs important for the international and intra-state transport

7iii) Development and modernisation of complex interoperable rail systems of high quality and support to the noise-decreasing measures

1.2 Improving technical conditions for international rail transport via implementation of selected TSI elements on the most important railways for international transport (outside TEN-T CORE)

1.3 Increasing attractiveness and quality of the rail passenger transport via renewal of the mobile means of transport.

Priority Axis 2 Road infrastructure (TEN-T CORE)

7i) Support to multimodal single European space via investment to the TEN-T

2.1 Removal of key bottlenecks in road infrastructure TEN-T via construction of new motorways and expressways.

Priority Axis 3 Public passenger transport

7ii) Development and improvement of the eco-friendly (including low-carbon and low-noise) transport systems, including inland waterways and marine transport, ports, multimodal connections and airport infrastructure, as to support sustainable regional and local transport

3.1 Increasing attractiveness of the public passenger transport via modernisation and reconstruction of the infrastructure for IDS and city rail transport

3.2 Increasing attractiveness of the public passenger transport via renewal of the mobile transport means of the rail city mass transport

Priority Axis 4 Waterway and airport infrastructure

7i) Support to multimodal single European space via investment to the TEN-T

4.1 Improving quality of services in public port of Bratislava

Priority Axis 5 Rail infrastructure (outside TEN-T CORE)

7d) Development and modernisation of complex interoperable rail systems of high quality and support to the noise-decreasing measures

5.1 Removal of key bottlenecks in railway infrastructure via modernisation and development of main railways and related objects (outside TEN-T CORE)

5.2 Improving technical conditions for international rail transport via implementation of selected TSI elements on the most important railways for international transport (outside TEN-T CORE)

Priority Axis 6 Road infrastructure (outside TEN-T CORE)

7a) Support to multimodal single European space via investment to the TEN-T

6.1 Removal of key bottlenecks in road infrastructure TEN-T via construction of new expressways

7b) Enhancing regional mobility via connection secondary and tertiary nodes with the TEN-T infrastructure

6.2 Improving safety and availability of the road infrastructure TEN-T and regional mobility via construction and modernisation of the first class roads

Priority Axis 7 Information society

2a) Enhancing broadband access and introduction of the high-speed and networks, and support to introduction of the advanced technologies and networks for digital economy

7.1 Increasing coverage by the broadband internet /NGN

2b) Development of the ICT products and services, electronic trade and enhancing demand on the ICT

7.2 Increasing capacity of the small and medium enterprises in digital economy

2c) Enhancing ICT applications in the electronic public administration, electronic learning, electronic inclusion, electronic culture and electronic health

7.3 Increasing quality, standards and availability of the e-Government services for entrepreneurs

7.4 Increasing quality, standards and availability of the e-Government services for citizens

Technical assistance

Operational Programme Efficient Public Administration

Priority Axis 1 Strengthened institutional capacity and effectiveness of public administration

1.1 Improved systems and optimised processes of public administration

1.1.1 S Improved systems and optimised processes of PA

1.1.2 Modernised HRM and increased competencies of employees

1.1.3 Transparent and effective application of public procurement rules and rigorous application of the 3E principles

Priority Axis 2 Efficient judicial system and increased law enforceability

2.1 Investments into institutional capacity and in the efficiency of PA and public services at national, regional and local levels with a view to reforms, better regulation and good governance.

2.1.1 Improved efficiency of the judicial system

2.1.2 Increased quality and enhanced independence of the judicial system

Technical assistance

Rural Development Programme

P1: Fostering knowledge transfer and innovation in agriculture, forestry and rural areas;
P2: Enhancing the viability and competitiveness of all types of agriculture, and promoting innovative farm technologies and sustainable forest management;
P3: Promoting food chain organisation, animal welfare and risk management in agriculture;
P4: Restoring, preserving and enhancing ecosystems related to agriculture and forestry
P5: Promoting resource efficiency and supporting the shift toward a low-carbon and climate-resilient economy in the agriculture, food and forestry sectors;
P6: promoting social inclusion, poverty reduction and economic development in rural areas.
M01: Knowledge transfer and information actions (1.1.) – Numbers; Professional training / learning skills (1.1.) – total public expenditure on professional training / learning skills by trainees. Total public investment (EUR) (professional training, exchange of agricultural businesses, demonstration activities) (1.1. to 1.3.).
M02: Advisory services, farm management and farm relief services (2.1.) Total public investment (EUR) (2.1 to 2.3)
M04: Total investments in physical assets (EUR) (public + private), Total public investment (EUR),
M06: Total investments in farm and business development, Total investments (EUR) (public + private), Total public investment (EUR),
M07: Basic services and village renewal in rural areas, Total public investment (EUR), Total public investment (EUR) (8.1)

M08: Basic services and village renewal in rural areas Total public investment (EUR) (8.4), Total public investment (EUR) (8.5), Total public investment (EUR) (8.6)
M10: Agro-environment-climate Area (hectares) within the agro-environmental-climatic support measure (10.1.), Total public investment (EUR)
M11: Organic farming, Area (hectares) – transition to the eco-farming (11.1.), Area (hectares)– further development of the eco-farming (11.1.), Total public investment (EUR), Area (hectares).
M12: Natura 2000 and Water Framework Directive payments. Area (hectares) – forest area in the NATURA 2000 System (12.2.). Total public investment (EUR)
M13: Payments to areas facing natural or other specific constraints, Area (hectares)– mountain areas (13.1.), Area (hectares)–other areas with significant nature limits (13.2.), Area (hectares) – areas with significant nature limits (13.3.), Total public investment (EUR)
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Operational Programme Fisheries

Union priority 2 Fostering environmentally sustainable, resource efficient, innovative, competitive and knowledge based aquaculture

Specific objective 2.2 Enhancement of the competitiveness and viability of aquaculture enterprises, including improvement of safety or working conditions, in particular in SMEs

Measure 2.2.1 Productive investments in aquaculture – Article 48(1)(a), (c), (d), (f), (g) and (h)

Specific objective 2.3 Protection and restoration of aquatic biodiversity and enhancement of ecosystems related to aquaculture and promotion of resource efficient aquaculture

Measure 2.3.1 Productive investments in aquaculture – Article 48(1)(e) and (j)

Union priority 3 Fostering the implementation of the Common Fisheries Policy

Specific objective 3.1 The improvement and supply of scientific knowledge and collection and management of data

Measure 3.1.1 Data collection – Article 77(2)(a) and (e)

Specific objective 3.2 Support for monitoring, control and enforcement, enhancing institutional capacity and an efficient public administration without increasing the administrative burden

8.3 List of boxes

8.4 List of tables

8.5 List of figures

9 Team of experts

Team of experts

Expert name
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Expert name	Role
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Mgr. Martin Obuch	Methodology / QA

10 References

Legislation

Council Regulation (EC, Euratom) No. 1311/2013 of 2 December 2013 laying down the multiannual financial framework 2014 – 2020.

Council Regulation (EC): No 1083/2006 of 11 July 2006 laying down general provisions on the European Regional Development Fund, the European Social Fund and the Cohesion Fund and repealing Regulation (EC) No 1260/1999.

Council Regulation (EC): No 1084/2006 of 11 July 2006. Establishing a Cohesion Fund and repealing Regulation (EC) No 1164/94.

Council Regulation (EC): No 1828/2006 of 8 December 2006 setting out rules for the implementation of Council Regulation (EC) No 1083/2006 laying down general provisions on the European Regional Development Fund, the European Social Fund and the Cohesion Fund and of Regulation (EC) No 1080/2006 of the European Parliament and of the Council on the European Regional Development Fund.

Council and European Parliament Regulation (EC): No 1304/2013 of the European Parliament and of the Council of 17 December 2013 on the European Social Fund and repealing Council Regulation (EC) No 1081/2006.

Council and European Parliament Regulation (EC): No 1080/2006 of the European Parliament and of the Council of 5 July 2006 on the European Regional Development Fund and repealing Regulation (EC) No 1783/1999.

Council and European Parliament Regulation (EC): No 1082/2006 concerning a European Grouping of Territorial Cooperation (5 July 2006).

Commission Implementing Regulation (EU) No 215/2014 of 7 March 2014 laying down rules for implementing Regulation (EU) No 1303/2013 of the European Parliament and of the Council laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund with regard to methodologies for climate change support, the determination of milestones and targets in the performance framework and the nomenclature of categories of intervention for the European Structural and Investment Funds.

Regulation (EU) No 508/2014 of the European Parliament and of the Council of 15 May 2014 on the European Maritime and Fisheries Fund and repealing Council Regulations (EC) No 2328/2003, (EC) No 861/2006, (EC) No 1198/2006 and (EC) No 791/2007 and Regulation (EU) No 1255/2011 of the European Parliament and of the Council.

Strategic, conceptual and methodology documents

Council Recommendation of 8 July 2014 concerning the national reform program in Slovakia in 2014 and which is delivering a Council opinion on the stability program of Slovakia for the 2014. http://ec.europa.eu/europe2020/pdf/csr2014/csr2014_council_slovakia_sk.pdf

European Commission and Economic Policy Committee (2014): *The 2015 Ageing Report: Underlying assumptions and projection methodologies*, European Commission, Directorate-General for Economic and Financial Affairs, European Economy, No 8/2014.

European Commission (2014): Recommendation for a Council recommendation on Slovakia's 2014 national reform programme and delivering a Council opinion on Slovakia's 2014 stability programme. COM(2014) 426. Brussels: European Commission.

European Commission (2014): Investment for jobs and growth, Promoting development and good governance in EU regions and cities: Sixth report on economic, social and territorial cohesion. Brussels: European Commission.

European Commission (2014): Programming period 2014-2020: Guidance document on monitoring and evaluation - European Regional Development Fund and Cohesion Fund– Concepts and Recommendations. Brussels: European Commission, Directorate General Regional and Urban Policy, March 2014.

European Commission (2013): Programming period 2014-2020: Monitoring and Evaluation of European Cohesion Policy - European Social Fund – Guidance Document. Brusel: European Commission, Directorate General Social Affairs and Inclusion, January 2013.

European Commission (2010): Europe 2020: A strategy for smart, sustainable and inclusive growth. Brussels, 3.3.2010 COM(2010) 2020 final.

http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:2020:FIN:EN:PDF

European Commission (2009): Reporting on Core Indicators for the European Regional Development Fund and the Cohesion Fund. Working Document No 7. Directorate-General Regional Policy. http://ec.europa.eu/regional_policy/sources/docoffic/2007/working/wd7_indicators_en.pdf

European Commission (2008): Cohesion Policy: investing in the real economy. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions of 16 December 2008 - COM(2008): 876.

European Commission: (2006) Indicative Guidelines on Evaluation Methods: Monitoring and Evaluation Indicators. Working Document No 2 (august 2006). EU Commission, DG Regional Policy

http://ec.europa.eu/regional_policy/sources/docoffic/2007/working/wd2indic_082006_en.pdf

European Commission: (2006): Indicative Guidelines on Evaluation Methods: Evaluation during the Programming Period. Working Document No 5. Directorate-General Regional Policy.
http://ec.europa.eu/regional_policy/sources/docoffic/2007/working/wd5_ongoing_en.pdf

European Commission (2006): COM(2005) 0299, Cohesion Policy in Support of Growth and Jobs: Community Strategic Guidelines. http://ec.europa.eu/regional_policy/sources/docoffic/2007/osc/050706osc_sk.pdf

European Commission (2000): The Lisbon Strategy. http://consilium.europa.eu/ueDocs/cms_Data/docs/pressData/en/ec/00100-r1.en0.htm

Ministerstvo hospodárstva (2013): Analýza podpory inovácií v podnikateľskom sektore prostredníctvom Operačného programu Konkurencieschopnosť a hospodársky rast.

Ministerstvo hospodárstva SR (2015): Operačný program Konkurencieschopnosť a hospodársky rast

http://www.nsrr.sk/download.php?FNAME=1382617395.upl&ANAME=OP+KaHR%2C+verzia+4.0.pdf

Ministerstvo školstva, vedy, výskumu a športu SR (2015): Operačný program Výskum a vývoj

http://www.nsrr.sk/download.php?FNAME=1367842193.upl&ANAME=OPVaV+v2.zip

Ministerstvo školstva, vedy, výskumu a športu SR (2015): Operačný program Výskum a inovácie

https://www.minedu.sk/data/att/6866.zip

Ministerstvo výstavby a regionálneho rozvoja Slovenskej republiky (2015). Národný strategický referenčný rámec 2007 - 2013http://www.nsrr.sk/narodny-strategicky-referencny-ramec-2007-2013/

Úrad vlády SR (2014): Pozičný dokument Európskej komisie k Partnerskej dohode a programom SR na roky 2014 - 2020. http://www.nsrr.sk/sk/programove-obdobie-2014--2020/pozicny-dokument-europskej-komisie-k-partnerskej-dohode-a-programom-sr-na-roky-2014---2020/

Úrad vlády SR (2014): Partnerská dohoda 2014 – 2020. http://www.partnerskadohoda.gov.sk/

Úrad vlády SR (2014): Posúdenie vplyvov politiky súdržnosti na rozvoj Slovenska s využitím vhodného ekonometrického modelu

Úrad vlády SR (2015): Operačný program Bratislavský kraj, revízia 17.6.2 dostupné na: stránke NRSR:

http://www.nsrr.sk/download.php?FNAME=1367841403.upl&ANAME=OPBK_revizia_17.6.2011%2C%2Boficialny%2Bnavrh.zip

Úrad vlády SR (2013): Systém riadenia štrukturálnych fondov a Kohézneho fondu na programové obdobie 2007 – 2013.Verzia 7. http://www.ropka.sk/dokumenty-na-stiahnutie/

Úrad vlády SR (2013): Výročná správa o vykonávaní Národného strategického referenčného rámca za rok 2013. Centrálny koordinačný orgán - Úrad vlády Slovenskej republiky. http://www.nsrr.sk/dokumenty/zakladne-dokumenty/

Vláda Slovenskej republiky (2014): Národný program reforiem 2014. http://ec.europa.eu/europe2020/pdf/csr2014/nrp2014_slovakia_sk.pdf

Vláda Slovenskej republiky (2014) Program stability Slovenskej republiky na roky 2014 až 2017]. http://ec.europa.eu/europe2020/pdf/csr2014/sp2014_slovakia_sk.pdf

Vláda Slovenskej republiky (2005): Stratégia rozvoja konkurencieschopnosti Slovenska do roku 2010. Lisabonská stratégia pre Slovensko. Uznesenie vlády SR č. 797/2005

Scientific and professional literature on evaluation

Atkinson, P., Delamont, S., Hammersley, M. (1988): Qualitative research traditions: a British response to Jacob, *Review of Educational Research*, 58(2): 231-250.

Austin, P.C. (2011): An Introduction to Propensity Score Methods for Reducing the Effects of Confounding in Observational Studies, *Multivariate Behavioural Research*, 46(3): 399–424.

Bachtler, G., Begg, I., Polverari, L. and Charles. D. (2013): Evaluation of the Main Achievements of Cohesion Policy Programmes and Projects over the Longer Term in 15 Selected Regions (from 1989-1993 Programme Period to the Present (2011.CE.16.B.AT.015), Final Report to the European Commission (DG Regio), European Policies Research Centre, University of Strathclyde (Glasgow) and London School of Economics.

Barslund, M. (2012): Recent Developments in Selected Education Indicators and their Relation to Europe 2020 Targets, National Institute Economic Review, National Institute of Economic and Social Research, 220(1), R6-R16.

Becker, S., Egger, P.H. and Ehrlich, M. (2010): Going NUTS: *The effect of EU Structural Funds on regional performance*. Journal of Public Economics 94: 578–590.

Becker, B. (2014): Public R&D Policies and Private R&D Investment: A Survey of the Empirical Evidence. *Journal of Economic Surveys*, 29(5): 917–942.

Bosseti, V. and Buchner, B. (2009): Data Envelopment Analysis of different climate policy scenarios, *Ecological Economics*, 68(5):1340-1354.

Bradley, J., Gács, J,. Kangur, A. and Lubenets, N. (2005): HERMIN:A Macro Model Framework for the Study of Cohesion and Transition. Integration, Growth and Cohesion in an Enlarged European Union. New York: Springer.

Burja, C. and Burja, V. (2013): Dimensions of sustainable development in Romania, *Revista Romana de Economie*, 37(2): 153-163.

Cace, C, Cace, S., Iova, C. and Nicolescu, V. (2009): Absorption capacity of the structural funds. Integrating perspectives. *Review of research and social intervention*. 27: 7-28.

Charnes, A., Cooper, W.W. and Rhodes, E. (1978): Measuring the efficiency of decision-making units, *European Journal of Operational Research*, 2(4): 429 – 444.

Clausen T.H. (2009): Do subsidies have positive impacts on R&D and innovation? *Structural Change and Economic Dynamics*. 20(4): 239-253.

Cooper, W.W., Seiford, L.M. and Zhu, J. (2010): *Data Envelopment Analysis, History, Models and Interpretations*. In Cooper, W.W., Seiford, L.M. and Zhu, J. (Eds): *Handbook on Data Envelopment Analysis* (second edition), Chapter 1, pp. 1 – 38. Springer, New York.

Czarnitzki, D. and Lopes-Bento, C. (2012): Value for money? New microeconometric evidence on public R&D grants in Flanders, *Research Policy*. 42(1): 76–89.

Donald, S.G. and Lang, K. (2007): Inference with Difference-in-Differences and Other Panel Data, *The Review of Economics and Statistics*, 89(2): 221-233.

Doyle, J.R. and Green, R.H. (2003): Comparing products using data envelopment analysis, *Omega*, 19(6): 631 – 638.

EC, European Commission (2015): The 2015Ageing Report, Economic and budgetary projections for the 28 EU Member States (2013-2060), European Economy No 3/2015, DG Economic and Financial Affairs.

Emrouznejada, A., Parkerb, B.A. and Tavaresc, G. (2003): Evaluation of research in efficiency and productivity: A survey and analysis of the first 30 years of scholarly literature in DEA, *Socio-Economic Planning Sciences*, 42(3): 151 – 157.

European Institute for Innovation and Technology (2013): *Analysis of synergies fostered by the EIT in the EU innovation landscape*, Publication prepared by the Technopolis Group.

Gerdessen, J.C. and Pascucci, S. (2013): Data Envelopment Analysis of sustainability indicators of European agricultural systems at regional level, *Agricultural Systems*, 118: 78–90.

Gestrelius, S. and Sandström, A. (2008): National and regional cluster profiles Companies in biotechnology, pharmaceuticals and medical technology in Denmark in comparison with Sweden, VINNOVA Analysis, VA 2008:10

González, X. and Pazó, C. (2008): Do public subsidies stimulate private R&D spending? *Research Policy* 37(3): 371-389.

Görg, H. and Strobl, E. (2009): The Effect of R&D Subsidies on Private R&D, *Economica*, 74(294): 215–223.

Groshek, G. (2015): *If at first you do not succeed: inclusive growth from Lisbon 2010 to Europe 2020*, pp .55-84, in Domonkos et al (2015): *Inclusive Growth and Employment in Europe*, Peer – Reviewed International Conference Proceedings, Bratislava, Slovakia, 3rd – 4th November 2015

Guloglu, B. and Tekin, R.B. (2012): A panel causality analysis of the relationship among research, development and innovation and economic growth in high-income OECD countries. *Eurasian Economic Review*, 2(1): 32-47.

Halkos, G.E., Tzeremes, N.G. and Kourtzidis, S.A. (2015): Measuring Sustainability Efficiency Using a Two-Stage Data Envelopment Analysis Approach, *Journal of Industrial Ecology*, DOI: 10.1111/jiec.12335

Hottenrott, H., Lopes-Bento, C. and Veugelers, R. (2014): *Direct and Cross-Scheme Effects in a Research and Development Subsidy Program*, ZEW Discussion Paper No. 14-107, Mannheim.

Hudrlíková, L. (2013): Composite indicators as a useful tool for international comparison : the Europe 2020 example, *Prague Economic Papers* No. 4/2013: 459-473.

Imbens. G.W and Wooldridge, J.M. (2009): Recent Developments in the Econometrics of Program Evaluation. *Journal of Economic Literature*, 47: 5-86.

Karasová, K. a Štefánik, M. (2016) Vyhodnotenie účinnosti opatrenia - príspevok na dochádzku za prácou : 6. kapitola = Evaluating the impacts of the intervention - Contribution to commuting. In Lubyová, M. a Štefánik, Miroslav. Trh práce na Slovensku 2016+. 1. vyd. - Bratislava : Ekonomický ústav SAV : Prognostický ústav SAV, Centrum spoločenských a psychologických vied SAV : Filozofická fakulta, Univerzita Komenského v Bratislave, 2015, s. 157-179. ISBN 978-80-7144-255-4.

Karczewska, M. (2015): The Gross Expenditures on R&D and the Economic Growth Level in the EU Countries, *Local and Regional Economy in Theory and Practice*, Wroclaw University, No 394:27--35

Klette, T.J. and Møen, J. (2012): R&D investment responses to R&D subsidies: a theoretical analysis and a microeconometric study. *World Review of Science, Technology and Sustainable Development*, 9(2/3/4): 169-203.

Kvetan, V., Mlýnek, M. a Radvanský, M (2006): Model HERMIN. *Ekonomický časopis*, 54(20): 994-1008.

Lábaj, M.. Luptáčik, M. and Nežinský, E. (2014): Data envelopment analysis for measuring economic growth in terms of welfare beyond GDP, *Empirica*, 41(3): 407-424

Lokshin, B., and Mohnen, P. (2012): Do R&D tax incentives lead to higher wages for R&D workers? Evidence from the Netherlands. *Research Policy* 42(3): 723-830.

Miteva, D.A., Pattanayak, S.K, and Ferraro, P.J. (2012). Evaluation of biodiversity policy instruments: what works and what doesn't? *Oxford Review of Economic Policy*, 28: 69-92.

Nayar, P. and Ozcan, Y.A. (2008): Data envelopment analysis comparison of hospital efficiency and quality, *Journal of Medical Systems*, 32(3): 193 – 199.

Pearl, J. (2009): Understanding propensity scores. Causality: Models, Reasoning, and Inference. (Second ed.). New York: Cambridge University Press.

Radvanský, M. (2014) Možnosti analyzovania vplyvu kohéznej politiky na regióny a trh práce SR. Bratislava: Ekonomický ústav SAV. 147 s.

Schilling, A. (2011): Skills and competences supporting service innovation - a literature review, Vinnova Report VR 2011:13

Shackleton, R. (2012): *Total Factor Productivity Growth in Historical Perspective*, Working Paper Series, Congressional Budget Office, Washington, D.C.

Solow (1957): Technical change and the aggregate production function, *Review of Economics and Statistics*, 39(3): 312-320.

Strauss, H. and Samkharadze, B. (2011): ICT capital and productivity growth, *European Investment Bank Papers, Productivity and growth in Europe*, 16(2) 8-30.

Sun, S. (2002): Measuring the relative efficiency of police precincts using data envelopment analysis, *Socio-Economic Planning Sciences*, 36(1): 51 – 71.

Štefánik, M. Lubyová, M., Dováľová, G. a Karasová, K. (2014). *Analýza účinkov nástrojov aktívnej politiky trhu práce : výstup v rámci aktivity A3-T5*: Problematika trhu práce podľa regionálnych a odvetvových rozdielov (*Impact evaluation of interventions of active labour market policy*). Bratislava : Centrum vzdelávania Ministerstva práce, sociálnych vecí a rodiny SR, 2014. 222 s.

Štefánik, M. (2015): Cost-benefit analysis (CBA) : Task 2 Chapter 9. In BONDONIO, Daniele - NEMEC, Rastislav. Evaluation of selected structural funds and cohesion fund interventions using counterfactual impact evaluation methods : final reports. - Bratislava : KPMG Slovensko, 2015, p. 187-197. Kapitola vyšla aj v slovenčine Štefánik M. Úloha 2, kap. 10 Analýza výnosov a nákladov (CBA analýza). [Bratislava] : KPMG Slovensko, 2015. S. 197-207.

Talluri, S. (2000): Data Envelopment Analysis: Models and Extensions, *Decision Line*, 31(3): 8 – 11.

Thanassoulis, E. (1993): A Comparison of Regression Analysis and Data Envelopment Analysis as Alternative Methods for Performance Assessments, *The Journal of the Operational Research Society*, 44(11): 1129 – 1144.

Úrad vlády SR. 2014. Posúdenie vplyvov politiky súdržnosti na rozvoj Slovenska s využitím vhodného ekonometrického modelu. Hodnotiaca správa 2014. Bratislava: KPMG Slovensko spol. s r.o.

Vogel, J. (2015): The two faces of R&D and human capital: Evidence from Western European regions, *Papers in Regional Science*, 94(3): 525-551.

Wallsten, S.J. (2000): The Effects of Government-Industry R&D Programs on Private R&D: The Case of the Small Business Innovation Research Program. *The RAND Journal of Economics*, 31(1): 82-100.

Zúñiga-Vicente, J.A., Alonso-Borrego, C., Forcadell, F.J. and Galán, J.I. (2014): Assessing the Effect of Public Subsidies on Firm R&D Investment, *Journal of Economic Surveys* 28(1): 36–67.