METHODOLOGY FOR PREPARING INVESTMENT PROJECTS FOR FUNDING FROM EUROPEAN UNION STRUCTURAL FUNDS AND/OR THE STATE BUDGET

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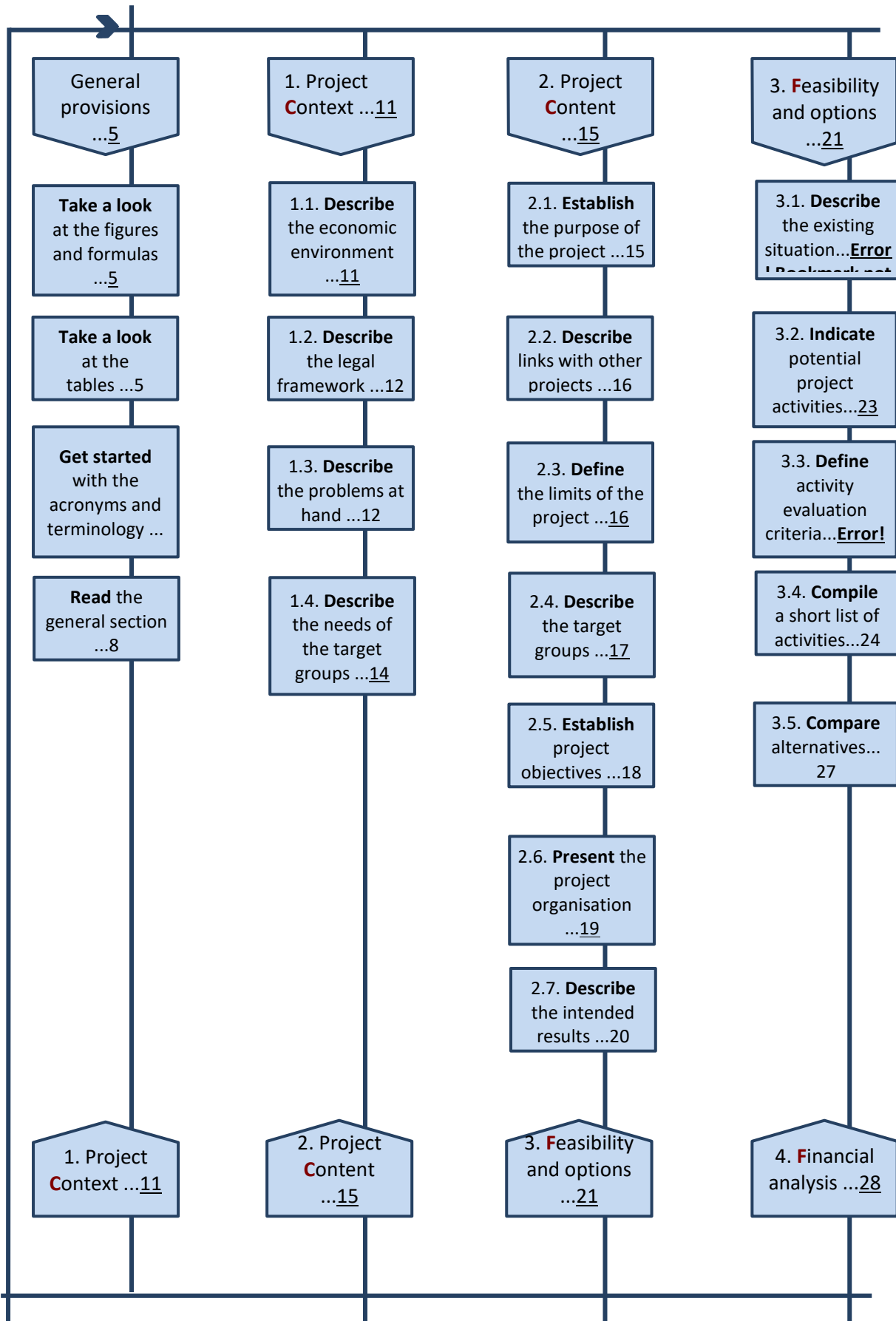
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General provisions

Get started with the acronyms and terminology

Demand for working capital: Working capital is the difference between existing shot-term assets and short-term liabilities. Demand for working capital is evaluated every year and, if there is a negative difference, sources of funding are indicated for covering insufficient cash flow.

Discount rate: an annual percentage used to determine the present value of future cash flow. The discount rate used in the calculator is calculated and changed

every year up to 1 December, and begins to be used from 1 January of the coming year.

Discount factor: a coefficient by which the nominal value of future cash is multiplied in order to calculate its present value. Present value is defined as the value of cash at the present time.

Discounted net revenues: net revenues expressed in present cash value, i.e., annual net revenues multiplied by the appropriate discount coefficient.

Discounted investment costs: investments evaluated in present cash value, i.e., annual investment multiplied by the corresponding discount coefficient.

ENPV: economic net present value. Calculated by adding discounted net cash flows up to the project time horizon. This indicator reflects the benefits the project will provide to the public, expressed in present value.

Economic benefit/cost ratio, EBCR: an economic analysis indicator that demonstrates the number of times the economic benefit generated by an IP exceeds its economic costs. Calculated according to the formula indicated in Section 5.4.

EU: the European Union.

EIRR: the economic internal rate of return. The discount rate at which the discounted economic value of investment is equal to the discounted cash flow value, i.e., when such a discount rate is applied, the ENPV equals zero.

FDR: financial discount rate.

FNPV: financial net present value.

Financial resources (*financial resources*):
1. Resources for funding project investments and operating costs that are not covered by project revenues.
2. Income generated by public sources, public insurance funds and other income generated from products and (or) services rendered once the project has been implemented.
Based on source, financial resources are typically classified as: EU funding, co-funding, national public capital, national private capital and other sources.

Financial benefit/cost ratio, FBCR: a financial analysis indicator that demonstrates the number of times the economic benefit generated by an IP exceeds its financial costs. Calculated according to the formula provided in Section 4.4.

FIRR: financial internal rate of return.

NPV: net present value.

Net operating revenues: the arithmetical difference between operating revenues and operating costs over the same period.

Net revenues to investment costs ratio: a ratio that demonstrates the portion of investments that will not be covered by net revenues generated (the investment costs that require funding).

Net cash flow: the main variable of CB analysis. Calculated as the difference between positive and negative cash flows every year of the time horizon.

FNPV of the investment: calculated by adding discounted investments, residual investment value and net operating revenue flows over the project time horizon. The indicator shows how the project's net operating revenue flows cover investments over the entire time horizon based on present cash value.

FIRR of the investment: The discount rate at which the discounted financial value of investment is equal to discounted cash flow value, i.e., when such a discount rate is applied, the FNPV (I) equals zero.

IP: investment project.

FNPV of capital: calculated by adding the discounted cash flows of funding allocated by the project owner[1], residual investment values, interest and operating revenue cash flows up to the project time horizon. The indicator shows the rate of return (net revenue value) on the project owner's invested capital based on present cash value.

Financial internal rate of return of capital, FIRR of capital: the discount rate at which the FNPV(C) is equal to zero.

Conversion factor, CF: a number used in economic analysis that is applied to a specific financial flow in order to convert it into an economic flow. The CF used in the calculator is calculated and changed every year up to 1 December, and begins to be used from 1 January of the coming year.

Residual value: a value that is calculated by adding or subtracting all of a long-term material or non-material asset's changes in value (changes or revaluations of fair value) from the initial price of purchasing or producing the asset and subtracting the accumulated amount of depreciation or amortisation.

Incremental analysis: CBA analysis is conducted by comparing the financial flows and generated benefit (costs) of each alternative to the present situation.

Depreciation rate: the systematic distribution of depreciated value over the useful life of an asset. The depreciation rate of each year is indicated as 1 in the numerator, and the economically useful life of an investment is indicated as the denominator.

Loans: funds loaned by credit institutions or other legal and natural persons used to implement an IP.

Private equity: any kind of assets owned by the project organisation and used to implement an IP (funds, real estate, know-how, intellectual property, etc.).

Time horizon: the number of years for which projections for project investments, operating costs, operating revenues, taxes, funding and economic benefit (cost) are provided.

Investment period: the number of years for which investment is planned (except for reinvestments).

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[1] 'Project owner' is a broader term than 'project organisation'. In general public IP cases, the project owner is the state of Lithuania.

SDR: social discount rate.

CEA, cost-effectiveness analysis: a method used to evaluate the cost-effectiveness of investment based on calculating the cost-effectiveness indicator for each implementation alternative.

CBA, cost-benefit analysis: a method used to evaluate the cost-effectiveness of investment based on a comparison of the costs necessary for implementing the project and the economic benefit generated by the investment.

Economic benefits and costs: the alternative costs and benefits generated for the entire economy. These benefits and costs can differ from private benefits and costs, and the difference between them depends on how much observed market prices differ from accounting prices.

Operating costs: projected or incurred costs for the use of assets created during the project or for generating project operating revenues.

Operating revenues: cash flows generated directly from users for products and (or) services provided as a result of the implemented project (created or modernised infrastructure).

IRR: internal rate of return.

Total investment costs: the sum total of investments necessary for the implementation of all project activities (including reinvestment). This includes all of the investments planned for achieving the objectives set for the project (in EU structural funding projects, the sum of costs that are eligible for funding and costs that are not).

Total expenditures: the sum total of cash flows for project investments, operating expenditures, taxes and loan repayment funds.

Total revenues: the sum total of operating revenues and funding resources.

PPP: Public-Private Partnership.

Read the general section

In order to make the process of drafting project proposals and evaluating them more effective, reduce the expenditures experienced by the public sector in relation to the preparation of IPs, improve competencies and skills in the area of investment planning in the public sector, and to make the practice of preparing IPs more consistent, the Central Project Management Agency (CPMA) has drawn up a methodology for preparing IPs (hereinafter referred to as the 'methodology'). This methodology presents detailed requirements for the structure and content of investment project proposals that seek EU structural funding and/or funding from the state budget, as well as practical examples of how the methodology can be applied. The requirements for structure define the number of parts that an IP must consist of, and the requirements for content establish the main questions that an IP must provide substantiated answers to.

An IP is a document that provides financial (economical), technical and social grounds for investment objectives, evaluates return on investment (commercial project) and other indicators for effectiveness, and determines required funding as

well as financial resources and deadlines.[2] The preparation of IP projects that will be proposed for state funding is established in the Guide to requirements applied to IP proposals[3]. The definition of an IP presented by this methodology is consistent with but not limited to the definition used in the guide because it establishes the need for one more crucial criterion for the internal logic of a project proposal: project results must be the consequence of project activities, project activities must create the conditions necessary to implement project objectives, and the latter must lead to the established aims of the project (vertical project logic).

The purpose of preparing an IP proposal is to asses all of the possibilities for implementing an IP as well as to select the most suitable implementation solution and a comprehensively substantiated implementation method, expenditures, results, etc. IP preparation includes the following:

a) conducting an extensive analysis of the problematic situation which necessitates the implementation of the project;

b) substantiating the need for change, defining requirements for specific changes that need to be achieved with the IP, conducting a feasibility analysis and an analysis of alternatives;

c) preparing an action plan (establishing a sequence of actions, how they are connected, their importance and their position in the general scheme of the project);

d) conducting a cost-benefit analysis.

Methodology user groups:

a) organisations and institutions, irrespective of type, owner or activity, that are preparing or plan to prepare an IP;

b) consulting companies that prepare IPs and consult other legal entities about the preparation of IPs;

c) executive institutions that assess projects seeking funding from the EU Structural Fund or the state budget;

d) other institutions and organisations that prepare long-term investment plans.

The provisions of the methodology are consistent with the following documents:

a) The Law on Investments of the Republic of Lithuania, passed on 07 July 1999, No. VVIII-1312 (State Gazette,1999, No.66-2127, latest amendment No. IX-2527, 02/11/2004, State Gazette., 2004, No. 167-6106 (17/11/2004));

b) Order No. 1K-256 of 13 August 2010 of the Minister of Finance of the Republic of Lithuania on the approval of the procedure for establishing criteria for evaluating state investments and results thereof;

c) Regulation (EU) No. 1303/2013 of the European Parliament and of the Council of 17 December 2013 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 and repealing Council Regulation (EC) No 1083/2006.

d) Commission delegated Regulation (EU) No 480/2014 of 3 March 2014 supplementing 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

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[2]Law on Investment of the Republic of Lithuania (State Gazette., 1999, No. 66-2127)
[3] Order No. 1K-310 of 15 September 2011 of the Minister of Finance of the Republic of Lithuania (State Gazette., 2011, No. 115-5418)

Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund;

e) The *Guide to Cost-benefit Analysis of Investment Projects* (Final report 12/2014) (hereinafter, the CBA guidelines) as commissioned by the European Commission;

f) Council regulation No. 1303/2013 detailing documents: Fiche No 13 „Implementing act on the guidance for the methodology for the cost-benefit analysis of major projects", Fiche No 18 „Delegated act on the methodology for the quality review of major projects", Fiche No 19 „Delegated act on the calculation of net revenue for revenue generating operations";

g) Florio, Massimo. Cost-benefit analysis and incentives in evaluation, 2007 m., ISBN: 978 1 84720 238 3.

h) *Methodology for the Assessment of the Quality of Optimum Project Implementation Alternatives*, approved on 13 October 2014 by the managing committee of the Operational Programme for the European Union Funds' Investment in 2014–2020 with resolution No. 35, published on www.esinvesticijos.lt and www.ppplietuva.lt.

i) Final report on the methodology and model for assessing the economic impact of investments funded from the European Union Structural Fund and the national budget of Lithuania (hereinafter the Methodology for Calculating Conversion Rates and Economic Cost-benefit Estimates), commissioned by the Ministry of Finance of the Republic of Lithuania and published on www.esinvesticijos.lt and www.ppplietuva.lt.

Due to the scope of the individual sections, the methodological recommendations were prepared under the presumption that the text is written in Arial font with font size 11 and single-spaced lines. Tables and figures are used to make IP proposals more informative. Tables, figures and formulas are numbered with a combination of two digits, where the first number indicates the number of the section and the second digit indicates the number of the table within that section (e.g., Table 3.4). Large figures and tables (that take up more than one page) are presented as annexes to the IP. Pages of the IP are numbered continuously. Structural parts of an IP are numbered based on the structure suggested by the methodology. New parts can be inserted and the numbering adjusted if necessary.

The methodology consists of two parts:

a) The descriptive section: this document presents the fundamental principles, key terms, CBA structure and calculation principles used when preparing an IP.

b) The calculator: an MS Excel calculator for conducting CBA for investment projects. The descriptive section explains how to use the calculator, the principles behind it and their relation to the descriptive part of the methodology. Download the calculator as an independent tool to be used alongside the methodology, save it to your hard drive and use it once you have completed sections 1 and 2 of the IP (Section 1-Section 2).

General requirements for data and information used to support an IP:

a) reliability: provide evidence from other scientific studies and analyses to support the presumptions of the IP;

b) from an official source: make sure that sources of information cited by the IP ate publicly accessible. We recommend using various strategic plans, the information systems and/or statistical data stored in the databases of public entities, opportunity studies, sector overviews, land use documents (general plan concepts, solutions, etc.), official projections and overviews for the development of the Lithuanian economy, population and housing census data, and the information systems and/or statistical data stored in the databases of other institutions;

c) relevance: use data that is no older than a year to substantiate the need for the IP. Use information gathered over at least a period of five years in order to

demonstrate various trends. Prognoses for demand should be underpinned by information about macroeconomic trends;

d) unambiguousness: use non-ambiguous statements to clearly establish your approach and attitudes;

e) comprehensibility: if the statements of an IP are based on the theses or conclusions of other research, provide references to the relevant sources of information and data, so that IP evaluators and other readers can examine the research behind your statements.

1. Project Context

Scope: up to 10 pages in standard font.

This section is for presenting the external and internal environment of the project. Providing a detailed description of the project context is essential when seeking to assess the suitability, feasibility and validity of the project content (aims, objectives, conditions for implementing project activities and results).

This part of preparing an IP is divided into the following stages:

1.1. Describe the economic environment of the project. The social, economic and institutional environment of the public service the project is designed to improve, major economic phenomena and factors that shape the need for such a project, possible trends during the implementation of the project (analyse the environment in a specific sector as well as on a regional and national level),

1.2. Describe the legal framework of the project. The regulatory background of the public service the project is designed to improve, identifying limitations for the provision of such public services,

1.3. Describe the problems the project seeks to address, and

1.4. Describe the needs of the target group. The needs of the public service the project is designed to improve (on a sector, region and nation-wide scale), strategic documents prepared for meeting these needs.

1.1. Describe the economic environment

First, analyse the macro-environment. Establish which social, economic or institutional environment you seek to implement the project in. The environment you choose to analyse should depend on the specific public service the project is designed to address: for example, the provision of primary healthcare would be analysed within the context of the healthcare system, and characteristics that describe the essence of the project should be selected for analysis. When analysing the economic environment, consider the scale of the project and determine whether it will operate on the regional, national or international level.

The main aspects and issues of the analysis should be the following (this list is indicative and non-finite):

a) the significance, purpose and aims of the public service the project is designed to improve;

b) how the public service is currently provided;

c) the typical (principal) institutions that provide the public service;

d) the basic functional scheme of how the public service is provided, the institutions involved;

e) what directly influences on what scale the public service is provided, the general tendencies of demand;

f) the strategic and potential directions the provision of the public service could head in;

g) how the provision of the public service is related to national macroeconomic indicators;

h) how much the provision of the public service is influenced by global tendencies (the impact of globalisation, climate change, the free movement of people and goods, etc.);

i) other aspects and issues that you find to be relevant.

1.2. Describe the legal framework

Describe the legal framework the project is to be implemented in, the legal acts that regulate the provision of the public service, the possible avenues for implementing the project, project activities, results, limitations on financial continuity and normative requirements. The documents you evaluate must address the legal framework on a national, regional and, if applicable, sectoral level. Municipal documents should only be analysed if the project organisation and/or its partner is a municipal institution.

The main points that the legal analysis should address:

a) the legal limitations placed on the providers of the public service (the type of legal entity, founder, institution size, operational limitations);

b) the regulatory preconditions necessary for the implementation of the project:

- with infrastructure projects, analyse issues related to the current or planned use of real property for the provision of the public service (whether the project organisation manages state property under trust law, is the owner of the property or simply uses it, etc.)

- with information society development projects, analyse legal acts that need to be passed or amended in order to ensure the provision of the public service once it is transferred to the digital realm (indicate the dates certain legal acts are to be passed or amended by, the institutions responsible for drafting and passing the bills, as well as the reasons for which these legal acts must be amended or passed and how the failure to pass or amend the legislation by the indicated deadline or within the project's time horizon will affect project results;

c) who will receive the results of project activities, whether there are any legal limitations that could affect the intended results (results must come in the form of specific equity of a public entity, etc.). If the legal dependence of the results of certain project activities differ, indicate each project activity and its legal dependencies separately.

1.3. Describe the problems at hand

Use this section to demonstrate the entire spectrum of issues that a certain public service faces: the unsuitability of infrastructure for providing the service, the ineffective provision of the public service, the discrepancy between the quality of the public service and the needs of the target group, etc. This is a very important part of understanding the scale and significance of the issue at hand and establishing the potential role of the project in the process of providing the public service. The problem must also be examined with a view to determining the scope of the project because the goal is to prepare a project that would contribute optimally to the better provision of the public service. Project owners must conduct an inventory of the issue at hand if only to find the optimum solution for investment.

With large complex projects, one can address several related or unrelated problems, however, it is essential that one of these issues is identified as the principal focus of the project, making it clear that the results of the project will lead to its resolution. In summary, use this section of the project proposal to:

a) identify the main problem that the IP is designed to address;

b) indicate the causes of the problem and whether the IP deals with these causes;

c) if any information is available about how an analogous problem was solved in other regions, municipalities, etc., briefly describe the situation and the solutions applied.

It is important to consider the exact problem identified in other parts of the IP, especially in the assessment of the project's economic impact and risks. It is also especially important that the author of the IP understand the essence of the problems the project addresses and its purpose, because an objective assessment of the existing situation is essential when planning project activities and setting goals.

A frequently occurring mistake is that the main problem is not clearly identified when assessing the economic benefit the project will generate, thus it is unclear what added value will be generated once the issue is resolved, i.e., when the project is implemented.

Once the problem is clearly and accurately identified, it is easier to see the necessary scope of the project and whether the planned activities are appropriate in scope to deal with the problem. The problems and root causes identified in this section will lend clarity to the aims and objectives of the project and the significance of the investments as described in other sections of the IP, and this will help those concerned evaluate whether the best solution for the problem has been chosen.

Table 0.1. *Problem analysis*

BEST PRACTICES	1) Problem: the supply of research and development (R&D) studies does not meet existing demand because R&D equipment does not meet current needs. Solution: acquire equipment that meets up-to-date R&D needs. Project activity: the acquisition of R&D equipment.
	2) Problem: there is a lack of social and economic initiatives in the village of Vasarvidis. Solution: create the infrastructure necessary for social and economic initiatives. Project activity: preparing and equipping premises where meetings of the village community can take place.
	3) Problem: accessibility to the public services of the central archive is insufficient. Solution: make central archive services available online by developing different electronic services for different target groups. Project activity: designing, developing, testing and marketing online services.
PRACTICES IN NEED OF IMPROVEMENT	1) Problem: a building at the centre of the Vasarvidis village is abandoned and unused. Solution: renovate and equip the hall of the unused building for the purposes of community activity. Activity: the reconstruction of an unused building. The problem that the project addresses is not clear, and the solution suggested does not have any relation to the problem.
	2) Problem: a fountain in the city centre is not operational. Solution: reconstruct the entire square, create a green zone and renovate the fountain. The problem that the project addresses does not correspond to the scale of the solution, and the formulation does not address specific target groups.
	3) Problem: the town library is in critical condition. The project activity 'acquiring book shelves and books' is not rational and does not resolve the project problem.
	4) Problem: public information services do not meet market needs (the data provided is not easy to use or relevant, users cannot choose different cross-sections of the data). The solution 'promoting information about the public information services provided' is meaningless because it does not resolve the problem the project is designed to address.

1.4. Describe the needs of the target groups	In order to assess need, you must first identify all of the target groups that an existing problem affects. A detailed analysis of project target groups is conducted in Section 2.4 of the investment project. Needs analysis is an especially important part of an IP because: a) this has a direct impact on the scope and limitations of the IP; b) this is one of the most important factors in determining the need for investment; c) it is an important factor in evaluating operating costs; d) it helps determine the level of project revenues, if such revenues will be generated; e) it frequently determines the amount of funding that is awarded from the state budget; f) it is an important variable of the economic cost-benefit assessment. When conducting a needs analysis, provide a comprehensive description of the factors that determine need and indicate their present scope. It is especially important to select the appropriate scope for your analysis, providing a detailed explanation for this decision.

Table 0.2. Project needs analysis

BEST PRACTICES	1) A modernisation project for a county hospital presents a detailed analysis of population, demographics and trends in the prevalence of disease. The analysis also addresses how healthcare institutions are arranged, their accessibility, the possibility to transport patients to national healthcare centres, especially in cases of difficult diagnosis. The project defines the critical period in which the patient needs to reach a healthcare institution. 2) A project for the development of online services presents a detailed analysis of how the physical provision of public services is organised, the processes and procedures involved, current operating costs, current operating revenues, legal restrictions, the shortcomings of providing physical public services as well as the need for eliminating physical services and replacing them with online services.
PRACTICES IN NEED OF IMPROVEMENT	1) When determining the number of students attending a college in city X, the project author assesses the changes in the population of city X, even though 40% of the college students are from other cities and towns in Lithuania. The increasing population of city X can distort understanding of the current situation because birth rates in other cities are lower. 2) Identified IP need: existing infrastructure has not been renovated since it was first built in 1952, thus it requires investment. This does not make it clear whether the infrastructure is needed at the moment or whether it will be needed by other target groups in the future. 3) An assessment of the need for online services did not examine what scope of service would be most appealing to target groups, and what kind of service would be most appropriate for the predominant level of computer literacy in the country.

Once the analysis of the project context has been completed, prepare a brief description of the results (up to 1,500 symbols), which you will later be able to incorporate in your project summary according to the guidelines set out in Section 7.6, and which should cover the following:
a) a description of the economic environment;
b) a description of the legal framework;
c) a list of the issues the project is to address;
d) a list of target groups and their needs.

2. Project Content

Scope: up to 10 pages in standard font.

In this section, present all of the essential elements of the project's content so that an appropriate implementation alternative can be formulated and selected for the IP:

2.1. Indicate the purpose of the project,

2.2. Describe how this project is linked to other projects,

2.3. Define the limits of the project. Indicate the methods and scope of the IP and how much it will contribute to solving the problem. If the problem that a project addresses is very broad in scope, and the project only seeks to address a small part of the problem, explain in detail which part of the problem or which aspect the IP will not be able to resolve,

2.4. Provide a detailed description of the target groups that will be directly affected by the implementation of the IP and will feel the economic benefits (costs) of the implementation of the IP.

2.5. Indicate the objectives of the project,

2.6. Introduce the project organisation. The project organisation is a legal or natural entity, or a group thereof, that takes on the responsibility of implementing a project and is the executive body with regard to the main project activities.

2.7. Describe the intended results, i.e., the planned impact of the project on the quantitative and qualitative changes of a public service.

2.1. Establish the purpose of the project

A clearly defined purpose makes it easier to under the economic benefit that will be generated by the investments of the project. The main question that needs to be answered when establishing the purpose of the project is: "What is the main economic benefit that the implementation of the project will generate?" The purpose should identify the systemic and structural changes that the project is designed to create and which are typically not limited to changes in quantitative indicators. Quantitative changes do not always represent the true purpose of a project.

If the intention is to seek EU structural funds and/or funds from Lithuania's co-funding fund, prove that the purpose of your project clearly corresponds to the provisions of strategic investment planning documents: the corresponding purpose of an action plan, priority and measure in the strategy for the use of 2014-2020 EU structural assistance or the corresponding national sectoral strategy or programme. The purpose of the project must clearly indicate that the project will contribute to the goal of a measure or an action programme priority.

Table 1.1. Establishing the purpose of the project

BEST PRACTICES

1) Project purpose: to improve the quality of healthcare services for the residents of western Lithuania.

2) Purpose of measure under action programme priority: to modernise and optimise public out-patient and in-patient service infrastructure in private healthcare institutions. Project purpose: to improve diagnostics in the early stages of illness, improve service quality and increase accessibility by modernising and optimising the infrastructure of secondary-level out-patient services.

3) Project purpose: to transfer the main services provided by courts in the process of executing justice online, creating more favourable conditions for residents to use court services and reducing their costs.

PRACTICES IN NEED OF IMPROVEMENT	1) Project purpose: to reconstruct one surgery department of a hospital in the Western district. The reconstruction cannot be the sole purpose in and of itself. 2) Purpose of measure: to modernise and optimise public out-patient and in-patient service infrastructure in private healthcare institutions. Project purpose: to reconstruct a building at 5 Vilnius Str. in an eastern city. The purpose of the project does not indicate how the project contributes to the implementation of the measure. 3) Purpose of measure: to create user-friendly, easily accessible and useful online public services and thus ensure that information and communication technology is effectively being used to modernise the public sector. Purpose of project: to acquire computer equipment and renovate the server facility. The purpose of the project does not indicate how the project contributes to the implementation of the measure.

2.2. Describe links with other projects	Provide brief descriptions of projects implemented by other institutions, organisations and/or companies, detailing results (or project activities, if the project is still being implemented), total investment values and purposes. Only present information about projects that are directly or indirectly related to your project. As you present information about these projects, be sure to: a) explain the link between the projects both from the perspective of project activities and results (the result of project No. 1: 10 km of newly constructed cycling lane along route A-B; the result of project No. 2: 5 km of newly constructed cycling lane along route B-C). b) indicate whether the link is direct or indirect. A direct link is one that establishes either a causal relationship between the projects (one project was the consequence of the implementation of another project: the teaching programme developed based on project No. 1 requires infrastructure for training specialists according to this programme) or supplementary (reconstruction work was carried out based on project No. 1, and the premises were furnished and equipped based on project No. 2). c) provide evidence to support that the costs necessary for implementing the project are not incorporated into the budgets of several different projects. This information is necessary in order to assess the risk of funding overlap.

2.3. Define the limits of the project	In order to define the limits of the project correctly, it is important to define the concept of a project first. In Latin, *projectus* means thrown forward. Therefore the term 'project' is first of all understood as the creation and/or initiation of purposeful activity aimed at creating change in the future, or an entirety of actions aimed at reaching a defined goal. Another distinguishing feature of the idea of a project is the fixed beginning and end of the activities it entails with limited resources. The definition of this term provided in part 2 (Art. 100) of section 2 of Council regulation No. 1303/2013 is primarily applicable to major projects: "A project is a series of works, activities or services intended in itself to accomplish an indivisible task of a precise economic or technical nature which has clearly identified goals." The CBA guidelines provide the following definition: "A sequence of economically indivisible tasks and activities intended to accomplish a specific technical function. All tasks are aimed at accomplishing an established project goal." The limits of a project are clearly defined when the project is assessed as an independent unit of analysis. The project should not be divided into smaller parts in order to make administration and implementation more simple.

Clearly <u>defined</u> project <u>limits</u> are an <u>indivisible unit</u> of further analysis composed of a <u>sequence</u> of <u>clearly defined</u> and purposeful economic and technical <u>tasks</u>, <u>activities</u> and <u>services</u>.

Table 1.2. Defining project limitations

BEST PRACTICES	1) The purpose of this project is to modernise primary and secondary school libraries in order to improve the quality of services provided to the school community and ensure better conditions for teaching and learning. The project will be implemented as one project, its organisation is the Education Supply Centre of the Ministry of Education and Science, and project partners include all the municipal and independent schools of Lithuania (240 school libraries in total). The project seeks to provide a consistent standard for library services and ensure effectively planned costs for the acquisition of large amounts of equipment. 2) Project purpose: to ensure the accessibility of online property and income declaration services to all the residents of Lithuania. The project is aimed at all of Lithuania's residents, thus project activities will cover the installation of an information system, testing, training and consulting across all the departments and branches of the State Tax Inspectorate.
PRACTICES IN NEED OF IMPROVEMENT	1) The purpose of this project is to optimise R&D activities in the chemical industry. The project will be implemented as three independent projects because R&D infrastructure will be modernised in three separate educational institutions without ensuring cooperation among them. Such a scenario means that implementation will no longer be completely in line with the overall goal, there will be a risk of funding overlap and the potential loss of control – and in turn effectiveness – in coordinating joint activities. 2) Purpose of project: to ensure consistent internet access across the rural areas of Lithuania. The project would only be implemented in Bartai district, which means that the project limits do not correspond to the formulated purpose.

2.4. Describe the target groups

The target group of a project consists of the users of infrastructure or services created by the project. They are the intended beneficiaries of the economic benefit (cost) generated by the project. When providing a detailed description of a project's target groups, be sure to:

a) indicate every target group or group of stakeholders (if possible, indicate the exact size of the target group or the number of individuals);

b) describe the impact the project will have on each target group;

c) explain why and how each group is invested in the project.

Table 1.3. Defining the target groups of a project

BEST PRACTICES	1) In conducting its regular activity, the project organiser provides group II disabled individuals of all ages with services. The project, which is designed to help disabled individuals integrate into the labour market, is intended for the group II disabled individuals that the project organiser provides services to, whose ages range from 25 to 45 and who are permanent residents of problematic territories in Lithuania. This group makes up 35% of all of the individuals the project organiser provides services to. 2) The project organiser provides physical and online public services and seeks to increase the number and variety of online services it offers with this project. The target group was determined based on age and education. An analysis of their needs was conducted. Project activities should create new public services online for individuals above the age of 18 studying in bachelor's or master's degree programmes.

| **PRACTICES IN NEED OF IMPROVEMENT** | 1) The purpose of the project is to improve the quality of consulting for educators by testing a new model for informing and consulting educators. No separate target groups are targeted. The organisation provides information and consulting services to the educators of Lithuania, thus the organisation's clients are all the educators of Lithuania. All of the organisation's, institution's or company's current clients are described prior to the project without specifying which target groups the project is intended for and what impact the implementation of the project will have on them.

2) The purpose of the project is to increase the accessibility of the public services provided by the institute. The institute does not currently provide online services. In order to increase accessibility, new and currently unavailable online public services will be created. This description presumes that the target group that will be using the online services corresponds to the beneficiaries of the institute's physical services, i.e., those users that are currently provided with physical services by the institute. The target group for the new online public services has not been considered (with regard to size, age, etc.). |

2.5. Establish project objectives

When planning project purposes, objectives and activities, be sure to do the following:

a) substantiate the clear and realistic quantitative and qualitative changes you seek to implement with the project, indicating how they correspond to the provisions and areas of strategic investment planning documents;

b) maintain a consistent internal logic throughout the project:

- project objectives should accomplish set goals;
- project activities must create the conditions for achieving project objectives;
- project results must be the consequence of project activities;

c) do not divide smaller supporting activities into further activities, for example, the preparation of a technical project, expert assessment or investment project.

The expanded structure of the logical basis of a project is presented below (*Table 1.4. Logical basis for the project basis for the project*). The IP must present such an expanded logical basis and transfer the short forms into the current application forms according to the structure indicated in the applications.

Table 1.4. *Logical basis for the project*

Objective	**Project activity**	**Physical indicator and unit of measure**	**Target value for physical indicator**
The purpose of the project is detailed by describing the objectives. Objectives should answer the question of what needs to be done in order to achieve the purpose. The purpose can be divided into one or several objectives.	*Specify the project activities (e.g., financial measure) that will be used to implement a specific project objective. Each project activity must have a specific implementation period and costs (budget).* *Each activity (e.g., financial measure) must be specified in a separate row.*	*Specify the physical indicator and unit of measure. Physical indicators are the quantitatively measurable and direct results of an implemented project activity (e.g., financial measure). A physical indicator is used to define what will be achieved once a specific project activity is implemented.*	*Indicate the target value for the physical indicator in numerical form.*

Each objective must be indicated in a separate row.		*Several physical indicators can be specified for one activity, and new rows can be added if necessary*	
(...)	(...)	(...)	(...)

2.6. Present the project organisation	Provide a comprehensive presentation of the organisation, institution, company (or group thereof) that will be implementing the IP. Present a break-down of the project organisation's composition: number of members, the main (leading) member, other members, how their work is interconnected, and any other additional information that might lead to a better understanding about the distribution of responsibility and principal functions in the implementation of the IP.

Present information about the project organisation by using this structure:

a) Applicant (if the applicant seeks to implement the project with a partner(s), then they might be referred to as a lead partner). The applicant takes on the most responsibility for implementing project activities: they are financially, organisationally and physically responsible for producing the results of project activities, so it is crucial that the IP presents a comprehensive picture of the organisation's capacity (capabilities) to implement the project: number of employees, range of implemented activities, experience, etc.

Provide information about the name of the legal entity, its identification code, the address from which the entity operates, number of employees, public services provided, responsibility for the public service the project is designed to improve, functions delegated by the state, independent functions, and any other activity the organisation is involved in.

b) Project partner(s) (if applicable). A project partner is either a legal or a natural entity that is interested in implementing the project and sharing responsibility, activities and the costs of the said activities with the applicant.

Provide information about the name of the legal entity, its identification code, the address from which the entity operates, number of employees, public services provided, responsibility for the public service the project is designed to improve, functions delegated by the state, independent functions, and any other activity the organisation is involved in.

Provide all the main information about the partner and any additional information that would demonstrate the relevant resources the entity has, the public services it provides and their experience with managing projects. Provide argumentation to support your choice of partner, the need for partnership, the form of the partnership, how responsibilities will be shared during the implementation of the project, what the roles of each partner will be, who will receive the results of the project and who will be responsible for the suitable use and maintenance of the project results.

c) Basis for cooperation between the applicant and partner(s). The joint participation of the applicant and partner must be well-grounded: the applicant and the partner must present argumentation to support their cooperation.

Indicate why partnership is necessary and how the partnership works: provide information about a partnership agreement, indicate the activities that will be implemented by the applicant and the partner(s), the role each partner will play in ensuring the continuity of the project, and how the responsibility for the implementation of the project will be distributed. Demonstrate that your partnership is not simply a formal agreement, but a true collaboration that resolves the problems addressed by the project. Get the intended project partners

involved in the preparation of the IP, so that the partners are informed about the project in advance and can participate in planning the IP with the applicant.

d) The role of the project in the project organisation. Explain the importance of the project to the activity of the applicant and partner(s), which public service the project is designed to improve and how provision of this service will change. Show which public services (targeted by the IP) or their parts are provided by the applicant and by the partner; the processes that will change in the applicant's and partner's institutions once the IP is implemented; the impact of the IP on the applicant's and partner's human and material resources.

2.7. Describe the intended results

Describe how the public service and the way it is provided to the public should change once the project is implemented, and specify the qualitative and quantitative indicators that will indicate whether the intended results have been achieved. The results of the project should explain how much and in what way the implementation of the project will resolve the problem the project is designed to address. In this section, it is not enough to simply specify the physical implementation indicators that will be used to measure the results – a comprehensive presentation of the indicators in every aspect must also be included. This section should also clearly state who will be incurring the costs of the project and who will be gaining from it directly.

Analyse and describe the probable impact of the project, both direct and indirect. A direct effect is considered to be any effect that directly affects the target group (users, employees, an organisation, etc.), and an indirect effect is anything that affects third parties and the external environment. Make sure that evaluations of the benefit generated by the project do not overlap in order to avoid overestimating the impact of the project (e.g., if two new jobs are created as a result of a project, one of the following components can be assessed: either the impact of these two new jobs on the growth of the GDP, or the benefit gained by market participants because wages are included in calculations of the GDP).

Table 1.5. Project results and consequences

BEST PRACTICES	1) Once an online asset declaration system has been implemented, users will be able to fill in declarations online, this will in turn speed up the process of reviewing and correcting declarations, reduce the risk of human error, and make the declaration of assets and income more accessible to all the residents of Lithuania. Result: one new online asset declaration system. Impact: the time it takes to review a single online declaration will be reduced by 40 minutes, minimising queues and saving residents' time. In this case, the result will be reduced expenditures of labour for the project organisation, improved quality of the public service and saved time for residents.
PRACTICES IN NEED OF IMPROVEMENT	1) The reconstruction of a hospital will enable the creation of two new jobs in the surgical department, and this will have a direct impact on the reduction of unemployment in Lithuania. Such a formulation does not take into account that the two job positions will be transferred from the department of traumatology, which will effectively decrease the number of jobs in this department.
	2) The implementation of an online information system will lead to the decreased use of paper and thus contribute to preserving forests. Such a formulation does not take into account the potential indirect negative impact on the paper industry.

Once the analysis of the project content has been completed, prepare a brief description of the results (up to 1,500 symbols), which you will later be able to incorporate in your project summary according to the guidelines set out in Section 7.6, and which should cover the following:

a) purpose of the project; b) links to other projects;
c) a description of project limits; d) a description of project target groups;
e) a list of project objectives; f) a description of the project organisation;
g) a description of the intended results.

3. **F**easibility and options

Scope: up to 20 pages in standard font.

This section is internationally known as the feasibility and option analysis. Use the following structure to conduct a feasibility and option analysis:

3.1. Describe the current situation within the scope of the problem at hand (in absolute numbers), assess how the situation would develop if the project organisation continued conducting operations without making any investments. This is the reference point for the further implementation of the project.

3.2. Describe possible activities that would fulfil the intended purpose and objectives of the project (compile an extended list of possible activities grouped according to certain criteria (e.g., type of activity: activity related to infrastructure, activity related to the development of human resources, etc.). The extended activity list is compiled for projects with a planned investment value of over EUR 3 million, and should be presented in the written description of the IP.

3.3. Indicate criteria for assessing activities (e.g., legal, technical (technological), environmental, financial, human resources, time necessary for implementation, an explanation for each criterion and the reasoning behind the choice of criteria),

3.4. Once you have assessed potential activities according to the chosen criteria, create a short list of activities and describe the possible alternatives for implementing the project as well as indicate the peculiarities and consequences of each alternative. The short list of best evaluated potential activities must list at least as many activities as the minimum indicated in the *Methodology for Evaluating Quality in the Selection of Optimum Project Implementation Alternatives*.

Feasibility and option analysis for the implementation of PPP projects is conducted in the same way as for regular IPs: the purpose of the analysis is to determine potential technical alternatives and choose the one that best suits the situation. A common mistake with regard to PPP projects is that one technical solution, in which the alternative is to be implemented in the public sector (for example, the construction of a building), is compared to a completely different technical alternative, in which the project is implemented by a private partner (e.g., for example the reconstruction of an old building). Regardless of whether an IP is developed as the first part of a PPP project document or simply as a planned investment solution, the options analysis is carried out by the project organisation seeking to accomplish the goals of the project – in the case of PPPs, this means the public sector seeking to implement the IP. The IP feasibility and option analysis is conducted in order to determine the most suitable method of investment for the public sector, and which, once chosen, will be assessed using a PPP partnership questionnaire if the project is implemented by a private partner.

| 3.1. **Describe** the existing situation | First, analyse the current situation within the scope of the problem at hand. Describe what would happen if the organisation were to continue operating as before, without implementing any investment activity. Financial flows should be projected for the period leading up to the project time horizon. It should not be assumed that maintaining the current situation without making any essential investments will cost nothing – when projecting financial flows, consider operating costs, the costs of maintaining infrastructure, generated and projected revenues as well as funding. The current situation will serve as a reference point for the further evaluation of options.

Main aspects of the existing situation:

a) depict the impending financial and economic situation if the project organisation were to continue operating as before without investing;

b) the essence of the existing situation is continued operation based on current operating principles;

c) evaluation of the reference point is mandatory for all IPs;

d) essential for evaluating other options because their financial flows are determined by calculating the difference (change) between theexistingt situation and each IP implementation alternative.

e) mean that a service is currently provided and will have to be provided even if the project is not implemented;

f) the revenues, funding, costs and (possibly) necessary investments (for maintaining existing infrastructure)[4] characteristic of the current situation;

g) a financial analysis of the current situation is carried out by expressing financial flows in absolute numbers, as opposed to changes in flow: i.e., the analysis takes into account the revenues and costs experienced by the project organisation during regular operation, sources of funding, etc. |

Table 1.1. *Evaluation of the existing situation*

BEST PRACTICES	1) The analysis establishes that investments are necessary in order to continue providing the public service. 2) The current situation is assessed without going beyond the limits of the project: the activity of the project organisation is analysed as much as is necessary for presenting the context in which the project is to be implemented. 3) The IP presents the IT resources available to the project organisation, the public services it provides and technical possibilities for modifying, supplementing and expanding these services.
PRACTICES IN NEED OF IMPROVEMENT	1) The evaluation concludes that if operations continue to be conducted as before, the public service would have to be discontinued, i.e., the organisation would no longer provide the service to the public. 2) Operating costs, funding and resources for maintaining the current situation are considered to equal zero, even though the public service is currently provided to the same target groups and will continue to be provided up to the time horizon of the project. 3) Currently provided public services are not analysed, even though some of them are provided online.

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[4] Necessary investments are costs that need to be expended in order to ensure the provision of the public service targeted by the IP up to the project's time horizon. This is why investment costs are mostly necessary: for example, if IT infrastructure is necessary for providing a public service, and the useful life of this infrastructure does not exceed 7 years, investment will be necessary in order to renew infrastructure at least once over the course of 15 years before the project's horizon line.

3.2. Indicate potential project activities	If the investment value of a project is lower than EUR 3 million, identify all the possible activities that could accomplish the objectives and goals of the project and compile an extended list of activities. If the investment value of a project is less than EUR 3 million, but greater than or equal to EUR 300 thousand, the number and content of the alternatives assessed can be selected right from the start according to the *Methodology for Evaluating Quality in the Selection of Optimum Project Implementation Alternatives* in consideration of the project type, i.e., a short list of activities is compiled right from the beginning, and the IP is then prepared according to Section 3.4 of the methodology. If the planned investment value is less than EUR 300 thousand, an assessment and comparison of project alternatives is not mandatory, however, a well-grounded explanation must be provided to support the choice of final alternative.

If a project to be implemented by the public sector is selected by way of tender, other alternatives need not be assessed when providing argumentation to support the final choice, unless the Terms and Conditions for Project Funding expressly demand it.

This part of the descriptive section of the IP should present an analysis of the possibilities for implementing the IP, which should be formulated with regard to the context analysed in Section 1and the content in Section 2.

Examples of IP implementation possibilities:

- A project designed to improve the quality of in-patient healthcare services could possibly go in one of two directions: either by improving quality in several national hospitals or in a larger number of small healthcare institutions of local significance (centralisation or decentralisation);
- In a project designed to improve energy-efficiency, decision-makers might consider whether to apply energy-efficiency measures or build new electric power plants that supply cheaper electric energy (object or subject);
- A project that seeks to reduce mortality due to blood infection could focus on expanding testing, improving conditions in operating rooms, implementing a more stringent control mechanism for blood transfusion, acquiring more advanced surgical equipment, etc.;
- With a project designed to modernise electronic services, decision-makers might consider options such as improving the quality of services by transferring them to a new platform (using new technology), improving the quality of existing electronic services by upgrading them and increasing accessibility, or even developing completely new electronic services.

Select the most suitable alternatives out of all the possible options and thus compile an extended list of activities, in which activities can be grouped according to the problem they address or activity type. The activities can also be grouped into certain combinations and/or individual groups.

3.3. Define activity evaluation criteria	This section of the methodology is mandatory for IPs with an investment value of EUR 3 million or more. It is only required for IPs with an investment value of less than EUR 3 million, if decision-makers have elected to compile an extended list of activities in Section 3.2 of the methodology.

Assess the extended list of activities based on the assessment criteria you have chosen.

The criteria should be set by the project organisation itself. Formulate criteria by taking into account the context of the project, the problems being addressed, the nature of the activities to be financed, etc. The assessment criteria should allow the project organisation to compare all of the potential activities and assess them

according to the most important criteria: relevance, effectiveness, implementation time, etc.

Table 1.1. Assessment criteria for potential project activities

BEST PRACTICES	1) Purpose: to promote cooperation between business and science, increasing R&D accessibility for business. Every potential activity is assessed based on its effect on the number and complexity of R&D studies. The same assessment criteria was used.
	2) Purpose: to increase the efficiency of the public sector by creating effective and easily accessible residence declaration services. Potential project activities are assessed based on the number of users that are ensured access to the declaration service, the time it takes to implement the activity, the number of institutions involved, the number of legal amendments the activity requires to be made, the reliability of service provision and other criteria.
PRACTICES IN NEED OF IMPROVEMENT	1) Purpose: to increase the accessibility and quality of healthcare services. The criterion "improved conditions for treatment in hospitals" is not appropriate because all of the potential project activities are designed to improve treatment conditions in hospitals.
	2) Purpose: to develop electronic tools for informing users about legal changes in the business taxation system. The criterion "cost of developing electronic tools" is not appropriate because the potential activities should be assessed both with regard to initial investment size and the cost of providing the services themselves, i.e., this criteria should be assessed as part of the cost/benefit analysis.

3.4. Compile a short list of activities and **describe** project alternatives

In IPs for which extended lists of potential activities were compiled, the activity assessment criteria in Section 3.3 of the methodology should be used to narrow this extended list of potential activities down to a short list.

If you wish to prioritise a certain criterion or give more weight to certain criteria or groups thereof, use a point or weight system. Potential activities can also be evaluated by using qualitative parameters. Use a 5-criterion evaluation system for both quantitative and qualitative assessments of potential activities. The activities that score best based on your criteria should be used to draw up a short list of potential activities. All of the activities in the short list should be investment activities, i.e., their implementation requires investment.

If the value of a project's investments exceeds EUR 300 thousand, create project implementation alternatives from the short list of potential activities, however, the number of alternatives assessed should not fall under the minimum established by *Methodology for Evaluating Quality in the Selection of Optimum Project Implementation Alternatives*. If, in your case, the alternatives laid out in the methodology do not allow you to objectively assess all of the potential project implementation possibilities, you must provide a reasoned explanation in the descriptive section of the IP about why these alternatives are not suitable and additionally formulate a new project alternative that would demonstrate why the project to be implemented is the best solution for the problem.

When formulating IP implementation alternatives, take into account the fact that all of the alternatives must enable the project to fulfil its purpose. General requirements for the analysis of project implementation alternatives are laid out below:

a) Object of analysis: changes in investment values, residual investment values, operating revenues, operating costs, taxes, funding and generated economic cost/benefit when comparing any IP implementation alternative with the current situation or, in the case of PPPs, flows of investment, residual investment values, operating revenues, operating costs, taxes, funding and generated economic cost/benefit in absolute numbers, without overstepping the limits of the project;

b) evaluate changes in the long-term, i.e., over the entire economic lifetime of the infrastructure that is to be created;

c) develop and analyse alternatives without going beyond the limits of the project (Section 2.3);

d) develop alternatives by taking into account existing limitations, for example, do not consider alternatives that require financial resources that the project organisation does not have and cannot acquire because this is simply pointless. Limitations might be legal (for the use of assets), political, economic (distortion of competition), etc. Limitations are listed in Section 1and 2 of an IP;

e) compare all of the realistic and technologically different solutions for implementation and explain why the IP implementation technology you have chosen is the most suitable option;

f) evaluate investments, residual investment values, operating revenues, operating costs, taxes, funding and the economic costs/benefits that the project would generate for each IP implementation alternative over the period of time you have determined as the useful economic lifetime of the infrastructure you wish to develop;

g) recommended alternatives for evaluation are described in the *Methodology for Evaluating Quality in the Selection of Optimum Project Implementation Alternatives*;

h) describe the alternatives, so that the essence, content and purpose of each alternative is clear to an evaluator or another user of the IP information.

i) A basic diagram of how alternatives should be developed is presented below.

According to the *Methodology for Evaluating Quality in the Selection of Optimum Project Implementation Alternatives*, the selected investment object of the project determines the kind of alternatives that should be evaluated in order to substantiate the optimum alternative (project investment objects and assessable alternatives are additionally presented in Annex 4).
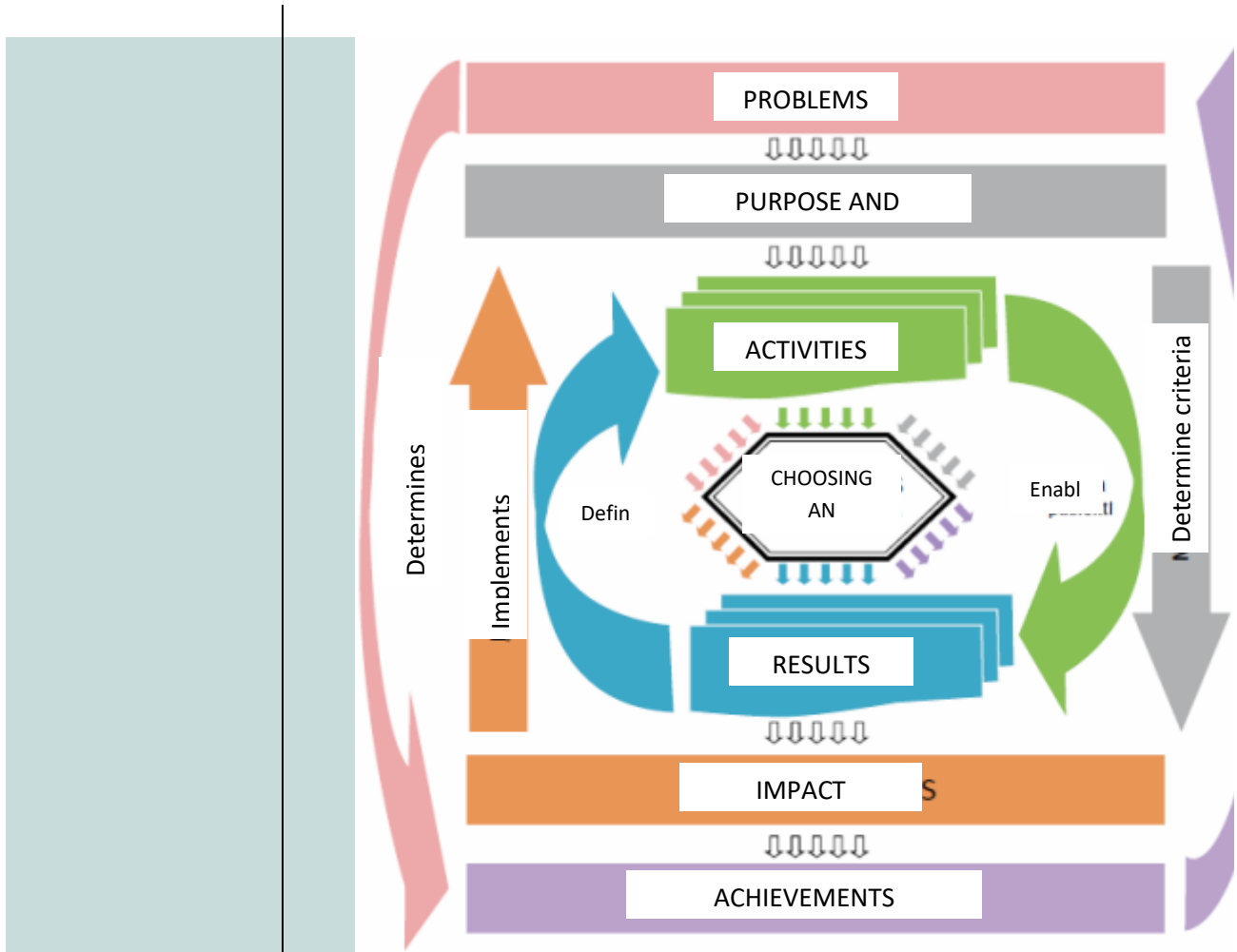
Figure 1.1. Diagram of the alternative development and selection process

The calculator is designed to compare the alternatives indicated in the *Methodology for Evaluating Quality in the Selection of Optimum Project Implementation Alternatives*, or additional alternatives in cases when a suitable project implementation method is not specified in the methodology. Provide a detailed description of the alternatives in the descriptive section of the IP, and present the financial and economic data of each alternative (investments, residual investment values, operating revenues, operating costs, taxes, funding and economic cost/benefit) in the calculator (do not include the calculations in the descriptive section because the MS EXCEL calculator is an integral part of the IP). Once you have assessed each IP implementation alternative, compare them based on the results of the financial and economic analysis according to the procedure set out in Section 4 and Section 5. Provide a commentary on your choice of alternative and explain why it is the most appropriate option.

When using the calculator, if at least one alternative produces a positive financial cash flow, the project organisation should then only compare alternatives with positive financial cash flows. The alternative with the greatest ENPV is selected in any case.

3.5.**Compare** alternatives	Use the CEA or CBA methods to compare alternatives and provide evidence to support the best choice of alternative. In ordinary cases, CBA should be used when preparing an IP, unless specified otherwise by the *Methodology for Evaluating Quality in the Selection of Optimum Project Implementation Alternatives* or the *Project Financing Conditions*.

CBA is comprehensively explained in Section 4 and Section 5 of the methodology. If an assessment and comparison of project implementation alternatives is conducted based on the CEA method, a product monitoring or physical activity implementation indicator should be selected for each investment object, and this indicator will then be used calculate cost-effectiveness indicators.

When applying the CEA method:

      1.1. select a product monitoring or physical activity implementation indicator (hereinafter referred to as an 'indicator') that suits the purpose of the project and which all of the project implementation alternatives being assessed will have in common;

      1.2. calculate the investment necessary for implementing project activities for each implementation alternative;

      1.3. calculate the cost-effectiveness indicator for each alternative by dividing the amount of investment necessary for an implementation alternative by the value of the indicator,.

The optimum alternative will be the one that produces a cost-effectiveness indicator of the lowest value.

The following conditions are necessary for applying the CEA method:

- Applicable qualitative requirements have been agreed upon in advance;
- There is no need to evaluate whether the implementation of the project will benefit the public;
- There is no need to evaluate whether the project is financially worthwhile (e.g., by calculating operating revenues).

Once a feasibility and option analysis has been conducted, prepare a brief description of the results (up to 1500 symbols), which you will later include in the project summary based on the method described in Section 7.6 and which should include a list of potential activities, a list of criteria for assessing activities, a short list of potential activities and a description of the alternatives analysed.

4. **F**inancial analysis

Scope: no restrictions.

When conducting the financial analysis, analyse the financial cash flows of each IP implementation alternative. Use the cash flow method: when calculating financial indicators, project costs (investments, operating costs, taxes, etc.) are indicated as negative cash flows, and project revenues (operating revenues, funding, etc.) are indicated as positive cash flows. When financial indicators are calculated, the cash flows over the period leading up to the time horizon should be discounted. Discounting is a method of calculating the present value of future cash flows.

The effect of time on a cash flow is determined by using a discount factor (Formula 2.1.).

Formula 2.1.Discount factor

$$\text{Discount factor} = \frac{1}{(1+i)^t},$$

where i = discount rate, t = years.

A financial analysis of the project is conducted in the following order:
4.1. Choose the project's economic activity sector and establish the time horizon,
4.2. Specify the financial discount rate (FDR);
4.3. Determine project cash flows (investment, residual investment values, operating revenues, operating costs, taxes and funding), and
4.4. Calculate financial indicators and formulate a conclusion regarding the viability of the project.

4.1. **Set** a time horizon for the project

The project time horizon is the number of years for which projections for project investments, residual investment values, operating costs, operating revenues, taxes, funding and economic benefit (cost) are made. This number of years is determined based on the period of time during which the long-term assets created by the project are considered to be economically viable (the useful lifetime of infrastructure). The project's economic activity sector must be specified in order to determine the period during which it is more useful to use the infrastructure by maintaining its useful properties (technical maintenance, repairs, etc.) rather than creating the necessary infrastructure anew.
A single IP might require investing in infrastructure that has varying lifetimes. In such cases, the project time horizon is established by evaluating the useful lifetime of the assets that will be using up the larger part of investment.

If projections are to be realistic and well-grounded, the chosen time horizon should not exceed 30 years. The financial analysis periods applicable to each sector are provided below.

Table 2.1. Applicable financial analysis periods

Sector	Recommended evaluation period (years)
Environmental protection (water and waste management)	30
Energy	25
Broadband internet	20
Education and science	25
Transport (railways, roads, urban transport)	30
Transport (harbours and airports)	25
Other sectors	15

In individual cases, due to the difficulty of projection and/or other objective reasons, shorter time horizons can be applied. If a shorter time horizon is applied, explain why.

Time horizon years are counted in calendar years and, when calculating financial indicators, the project begins in year zero. The time horizon should be set so that projections can be made for a period of time no shorter than the planned number of full years (e.g., if project implementation begins on 4 September 2015 in the social security sector, then the time horizon shall be set for 2030). Do not divide the project time horizon into stages, i.e., do not separate the project investment period (when the project infrastructure is being developed) and the years of activity implementation (once the infrastructure is already in place).

If certain project investments were made prior to the launch of the project, indicate all of these investments in Year 0.

The maximum time horizon for a PPP project is **25 years**.

Table 2.2. Setting a project time horizon

BEST PRACTICES	1) The first year of a project planned in the sector of education and science will be 2016 and the last year will be 2041. 2) The first year of project implementation will be the first year that investment costs are incurred.
PRACTICES IN NEED OF IMPROVEMENT	1) The project time horizon begins on the fourth year of project implementation, even though investment costs were incurred during the first three years, costs that are analysed without going beyond the limits of the project. 2) The years of the project investment period are separated from the remaining years of the project time horizon.

4.2. Indicate the financial discount rate

The FDR for investment projects implemented in Lithuania can be set by a separate legal act passed by the Ministry of Finance. If such a legal act is passed, the FDR established by the Ministry of Finance should be used when conducting the financial analysis. While no FDR has been set by the state, use a rate of 4% in your financial analysis.

When applying the real FDR, conduct the analysis with real prices, i.e., do not adjust projected cash flows for inflation. If a portion of the investments have already been made as you plan the IP, specify these investments under Year 0 without discounting them.

In the calculator, indicate project investments, residual investment values, operating revenues, operating costs, taxes and funding cash flows in real prices as well.

4.3. Identify project cash flows

When conducting the financial analysis, indicate the following project cash flows:

    4.3.1.   project investments,

    4.3.2.   residual value of investments,

    4.3.3.   operating revenues,

    4.3.4.   operating costs,

    4.3.5.   taxes, and

    4.3.6.   funding.

4.3.1. Project investments are all of the projected costs that will necessarily be incurred in the implementation of project activities. These projected costs are calculated once project results have been defined. Do not divide the sum total of costs according to source of funding (you will do so when you analyse funding). Use this section of the IP to evaluate the real need for investment and plan the real sequence in which the investment costs will be incurred as well as their portions and proportions.

When projecting investment costs, evaluate the following:

- the current state of available assets. If you plan to reconstruct existing assets, critically evaluate the current condition of these assets and provide a comprehensive description of them in the IP and in subsequent documentation (procurement documents, etc.).

- the investment experience of the project organisation. If you represent a municipal administration, you can use the costs of public services, work and goods implemented up to the preparation of the IP for more accurate investment planning.

- market trends for analogous work, goods and services. Review and adjust projected investment costs according to the situation in corresponding market sectors, e.g., during a construction boom, contractors will expect greater profitability than in periods of stagnation, therefore, adjust investment cost sums by taking into account possible price rises. If the market can only offer a single service provider capable of developing the special-purpose information systems you need, you can also expect greater investment costs.

- the possibility that a project procurement will attract international competition. Because Lithuania is a participant in the international market of the EU, greater project investment values and the procurement of special goods, services or work will likely attract both Lithuanian and international companies to compete in the procurement process of an IP. The participation of international companies often means the possibility of more favourable offers, therefore, take this into account when projecting investment values.

- time restrictions (limitations). Evaluate whether the projected time frame for the implementation of the IP is appropriate for the type, scale and complexity of the project. When the implementation plan of an IP is very intense and does not allow for delays, evaluate whether contractors or providers of goods and services will expect greater profitability from taking on the risk of executing IP activities, thus raising investment costs even further than planned in the long run.

- seasonality. This factor mostly restricts the course of project implementation because construction costs are typically higher in the less favourable seasons. If there is a sufficient amount of time and the contractor or service provider maintains the right to plan technological processes according to season, it becomes increasingly likely that construction costs will be lower.

Provide a detailed description of the preconditions upon which investment costs were projected and indicate the final value of the investments. One of the most crucial preconditions is the duration of the investment process. Consider the duration of the investment process and the projected value of investment, and depending on the course of activity implementation, distribute the investment value in specific portions across the project time horizon.

Table 2.3. Projecting investments

BEST PRACTICES	1) Investments are not adjusted to inflation. Investment size is determined according to the results of previously conducted procurements or based on quotes provided by potential suppliers. 2) The size of the investment for creating an information system is calculated by evaluating the need for technical equipment and the number of hours the specialists of the information system development company would have to work in order to create the information system. 3) Project investments include procurement VAT, which the project organisation incorporates into investment costs in its accounts.
PRACTICES IN NEED OF IMPROVEMENT	1) Project investments include procurement VAT, which the project organisation can incorporate as a deduction and then be reimbursed. 2) Project investments include procurement VAT, part of which a project organisation conducting a variety of activities can incorporate as a deduction and then be reimbursed. 3) Project investments include overheads that have not been presented in the IP (as to their nature and content) and are unsubstantiated in scale.

In the calculator, investments should be indicated in row A of each alternative. Express all project investment values as positive whole numbers. Express a decrease in investment with negative whole numbers. The investment value indicated in the calculator should correspond to the value indicated in other documents.

By default, the calculator suggests applicable VAT rates for every budget row in the general prerequisites sheet. The user can adjust these rates according to necessity and within the limits of the law.

If VAT cannot be reimbursed, then incorporate it into the IP's investment cost price and the financial flows of operating costs, and accordingly, in the general prerequisites sheet of the calculator, tick the "Mark, if VAT cannot be included in VAT deduction and reimbursed" box.

4.3.2. Residual investment value is the value of long-term assets at the end of the project time horizon. Only calculate residual value for assets that are to be purchased or created with IP investment funds.

Take the project time horizon into account when calculating residual values. Residual values are only calculated when the useful lifetime of an asset exceeds the project time horizon. Residual values can be calculated in three ways. If a project generates net revenues, the net revenue method must be applied, i.e., residual values are calculated by assessing the net present value of the project's projected net revenues after the end of the project time horizon, on the final day of the time horizon. The number of years evaluated is equal to the depreciation rate of the long-term asset that requires the largest portion of the project's investment, minus the project time horizon. If the project does not generate any net revenue, you can use the "accounting value" or "selling value" methods, depending on whether the project organisation intends to sell the assets created during the project

after the time horizon or not. In the first case, residual value is equal to the cost price of creating an asset minus the depreciation value accumulated over the project evaluation period and calculated according to the depreciation rate. In the second case, the residual value is set equal to the asset's selling price on the final day of the project evaluation period without adjusting to inflation.

If the project time horizon corresponds with the end of the useful lifetime of the asset, residual value is not calculated. Residual value should only be calculated for assets that are created during the project implementation period. If the implementation of the project entails the reconstruction or renovation of an asset that increases the value of the reconstructed or renovated asset, this increase in property value is considered to be an asset that is created during the implementation of the project, and it must be taken into account when calculating the residual value of the asset.

Residual value is only assessed when calculating the sum total of costs eligible for funding if net revenues are positive.

In the calculator, only indicate the residual investment value for the last year of the project evaluation period, in column B of every alternative. Express residual values as positive whole numbers. Express a decrease in residual investment value with negative whole numbers.

In the calculator, the sum of costs considered eligible by the EC (in those cases when the IP is to be financed by the EU Structural Fund) is calculated by adding the residual investment value to the operating revenues, and financial indicators (FIRR (I), FNPV(I), FIRR (C), FNPV(C), financial viability of the IP) are calculated by subtracting the investment sum from the residual investment value[5].

Table 2.4. Project investments and residual value

		Project time horizon				
		0	*1*	*2*	*...*	*N*
A.	Total investments of alternative					
A.1.	Land					
A.2.	Real property					
A.3.	Construction, reconstruction, renovation, other work					
A.4.	Equipment, devices and other assets					
A.5.	Design, technical maintenance, and other services related to investment in long-term assets (A.1.-A.4.)					
A.6.	Project administration and implementation					
A.7.	Other services and costs					
A.8.	Reinvestments					
B.	Residual value of investments					

4.3.3. Project operating revenues are revenues that are generated directly from the user for the goods and/or services created by the implementation of the project, for example: payments made directly by the users for the use of infrastructure, the sale or lease of land or buildings, payments for services, etc.

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[5] Calculation does not depend on whether the project organisation has the right to use financial flows to the sum of the residual value.

Before specifying the operating revenues of a project, present and explain the circumstances under which they are generated and under which they can potentially change over the course of the project time horizon and consider the following:

a) the number of users of the public service and how this number might change;

b) how frequently users need to use this public service and how this might change;

c) the factors (household revenues, purchasing power of the users, etc.) that influence the price of the public service (if it is not provided free of charge);

d) the time it takes to provide the public service;

e) changes planned for the public service during the project time horizon (services might be altered, joined together, etc.);

f) other factors that might influence the scope of the provision of the public service.

Project operating revenues should include revenues that are generated by using the assets that are currently being created or have already been created as part of the project. They should not include the revenues generated by the entire organisation or company if the project covers only a certain part of the operations in a large organisation.

Income generated from private and public funds that was not accumulated through tariffs, payments, fees, taxes, rent or other direct payments made by users, should be indicated as sources of financing. Income generated from public sources, insurance funds (e.g., the compulsory health insurance fund, the social insurance fund, etc.) should also be indicated as sources of financing.

In the calculator, operating revenues should be indicated in column C of each alternative. Express all operating revenue values as positive whole numbers. Express a decrease in operating revenues with negative whole numbers.

In the calculator, indicate projected real revenue flow, however, do not increase the results of subsequent years by the amount of projected revenue growth, unless a growth of revenue is projected due to an increase in users or other real and objective reasons.

4.3.4. Project operating costs are costs that are incurred when utilising the assets created during the implementation of the IP for the purpose of providing a public service. The type, properties and size of project operating revenues depend on the following:

a) the operational peculiarities of the infrastructure that was modernised as a result of the IP (for buildings: energy resources, utility and repair costs; for equipment: operating costs, operating costs for tools and materials);

b) the demand for human resources in the provision of the public service;

c) the scope of provision of the public service;

d) the intensity of provision of the public service;

e) other factors.

Consider the following principles for evaluating operating costs:

1) when evaluating project operating costs, do not go beyond the limits of the project, that is, do not evaluate all of the operating costs incurred by the project organisation (typically, an IP only covers a certain portion of the organisation's operations).

2) Evaluate the need for the recurring costs of replacing assets (in whole or in part) created during the project that depreciate before the time horizon is over.

Reinvestment and infrastructure maintenance costs will have to be covered in order to ensure the continuity of a public service:

a) if the economic lifetime of an investment or its separate components (for example, when the organisation invests in the construction of a new building and R&D equipment) is shorter than the project time horizon, plan for recurring costs for replacing the depreciated parts of the assets created during the project (for example, worn flooring will have to replaced in areas that experience heavy pedestrian traffic – entryways or the vestibule). Such costs are considered to be infrastructure maintenance costs and should be specified in row D.1.5. of the operating costs table.

b) reinvestments are those costs that are incurred when long-term assets that were created during the IP are replaced in full (for example, if the time horizon covers a period of 15 years, computer equipment should be replaced every 5 years, thus such costs are considered reinvestments). Indicate reinvestments in row A.8 of the table. Because reinvestments replace long-term assets in full, you can increase the residual value of investment and recalculate the annual depreciation amount for material assets (or amortisation for non-material assets).

3) indicate loan interest costs in row D.2. of the table.

4) decreases in operating costs (savings) should be indicated as negative numbers, thus increasing project net revenues.

5) if separating project revenues directly from the remaining costs incurred by the project organisation is impossible, use the following methods:

• comparison. When applying this method, compare the differences of revenues and/or costs of the project organisation in the current situation and the alternative being evaluated. When using this method, only include the additional portion of operating revenues and/or costs that are generated due to the implementation of the IP in the project operating costs.

• *pro rata*. Use this method with projects that generate revenue. Attribute operating costs to the project based on the principle of *pro rata* (proportionally). Based on this principle, analyse the value of the assets to be created and the residual value of the project organisation's assets up to the implementation of the project. Compare the value of the newly created assets to all of the project organisation's assets and attribute a corresponding percentage to the project operating costs as compared to all of the organisation's costs.

• other models, if they are more appropriate for your IP. If you choose to use a different model, indicate what model you have chosen, why and how the model works.

Indicate project operating costs for every alternative in row D of the calculator. Express all operating cost values as positive whole numbers. Express savings (a decrease) in operating costs with negative whole numbers.

In the calculator, indicate the projected real cost flows and growth of costs, if such growth is projected due to an increase in the number of users, changes in the amount of materials used, changes in number of employees or other similar reasons, however, do not index the flow if growth is expected due to a general growth in costs.

Table 2.5. Determining operating revenues and costs

| **BEST PRACTICES** | 1) The project provides a detailed description of projected operating revenues and costs for maintaining the results created during the IP.
2) The project only analyses changes in revenues and costs that emerge from the implementation of the project or operating revenues and costs in absolute numbers without going beyond the limits of the project.
3) Project revenues are forecast by taking into account the purchasing power of the public service users. |

PRACTICES IN NEED OF IMPROVEMENT	1) The sources of revenues and costs are either insufficiently presented or not specified at all. 2) The project analyses all of the revenues and costs experienced by the organisation, as opposed to analysing changes influenced by the implementation of the IP or investigating operating revenues and costs in absolute numbers within the limits of the project. 3) Financial resources received from public sources (funds from the state budget, funds from a municipal budget and other state funds) are incorporated as project revenues. 4) The depreciation of assets purchased with funding are reflected as the applicant's costs or as operating costs. 5) The project result is an information system, and the operating costs assessed are an increase in utility costs.

If you seek to implement an IP as a PPP and plan to use EU structural funds, in order to calculate the maximum and projected property liabilities of the public sector, you must additionally create a consolidated forecast (of the infrastructure user and infrastructure owner) of operating revenues and costs, so that the net cash flow reflects total revenues generated by the assets that were created by using EU structural funding.

Table 2.6. Examples of public sector operating cost and revenue dynamics in various IPs

Operating revenues	Operating costs
Revenues from scientific studies (for businesses, line ministries, etc.) – increase once appropriate infrastructure is created.	*Remuneration costs* (including social insurance taxes and other taxes) – savings are usually made because operational efficiency increases.
Revenues from leasing premises (for offices, activities, etc.) – increase once the physical condition of infrastructure is improved.	*Energy costs* (for lighting facilities, operating equipment, technology, etc.) – savings are made if the lighting and heating system are overhauled; costs increase if additional equipment is acquired.
Revenues from providing paid services (broader in scope than the established standard for the public service) – once the possibilities for providing services are expanded (once scanning and digitisation equipment is acquired); if legal acts do not restrict it, certain public services can be provided on a larger scale if users are made to pay for them.	*Operational costs* (for operating equipment, information systems, etc.) – increase if a new information system is created; decrease if an old street lighting system is replaced by a new one. *Stationery costs* (paper, binders, printing ink, powder, etc.) – decrease if a new information system is created and services are provided online without the need for stationery materials.
Revenues from selling assets created and/or acquired during implementation (selling old equipment, vehicles, etc.) – if a project organisation plans for any number of reasons to sell the assets created during any year of the	*Infrastructure maintenance (routine repair) costs* – typical of renovated or newly constructed buildings (repainting ceilings, replacing wall surfaces, etc.).

evaluation period, this must be taken into account.

4.3.5. Project taxes are cash flows that result from the implementation of IP activities.

If you wish to correctly evaluate the value-added tax that will have to paid as a result of the project, use the questionnaire provided in Section 3 and the calculator.

Only indicate the (sales) value-added tax for operating revenues if this tax will be incorporated in the cost of your services or products.

Only indicate excise duties, customs duties and other taxes if such taxes will be incorporated in the cost of your services or products.

Indicate project taxes in column E of each alternative in the calculator. Express all project taxes as positive whole numbers. Express savings (decreases) in taxes with negative whole numbers.

A separate table should be created for evaluating the operating revenues, operating costs and taxes of each IP implementation alternative based on table 4.7 in the calculator.

Table 2.7. Project operating revenues, costs and taxes

		Project time horizon				
		0	*1*	*2*	*...*	*N*
C.	Total revenues					
C.1.	Sales revenues					
C.2.	Service revenues					
C.3.	Financial and investment activity and other revenues					
D.	Total operating and financial costs					
D.1.	Operating costs					
D.1.1.	Raw material					
D.1.2.	Remuneration costs					
D.1.3.	Electricity costs					
D.1.4.	Heating costs (except for electricity)					
D.1.5.	Costs for infrastructure maintenance					
D.1.6.	Other costs					
D.2.	Loan interest (G.3.1.) received					
E.	Taxes (+ negative influence; - positive influence on project cash flows)					
E.1.	Total import/purchase VAT					
E.2.	Total sales VAT					
E.3.	Total sum of other payable indirect taxes					
F.	Net operating revenues (C.)-(D.)					

4.3.6. Funding necessary for the implementation of the IP (requested funding) should be divided into the following groups:

1) funding from EU structural funds and other non-repayable funds from foundations, organisations and institutions. Information about such funds should be provided by specifying the name of the specific funding source (fund, measure). If funding is requested based on a State Capital Investment Programme, such funds should be indicated in the "RL co-funding" row.

2) a public contribution is public funding from a state and/or municipal budget or from other public sources of funding, specifically intended for implementing an IP. Plan this portion of public funding both for the project

investment period and the entire project time horizon. When evaluating public projects, consider the situation from the position of the state as the project owner, and thus add publicly-sourced cash flows to external financial resources. Such funds should be specified in the "Public funds (state, municipal budget, other source of public funding)" row.

Also attribute income that does not come from tariffs, duties, taxes, rent money or other forms of direct payment from the user to the financial resources section.

Co-funding and funds from special programmes for covering funding-ineligible VAT, are attributed to the category of public contributions, however, such funds should be specified in the "Funds from special programmes for covering funding-ineligible VAT" row.

3) a private contribution is funding from a private source that can be planned for in the IP if at least one private subject is part of the project organisation. Such private funds should be specifically intended for the implementation of the project. The funds should be indicated in the "Private funds (own funds, other private funds)" row. Conduct the financial resources analysis from the position of infrastructure owner, i.e., include all cash flows that you plan to spend on creating and/or modernising public infrastructure.

4) other sources are funds loaned for the implementation of the IP. Separately indicate loans issued by the European Investment Bank and other commercial banks. Such funds should be indicated in the "Loans", "Loan repayments (except for interest)" and "Other international funding" rows.

Indicate project funding in row G. of each alternative in the calculator. Express all project financing values as positive whole numbers. Express a decrease in financing with negative whole numbers.

Table 2.8. Project financing

		Project time horizon				
		0	*1*	*2*	*...*	*N*
G.	Total funding					
G.1.	Requested funding					
G.1.1.	EU structural funding					
G.1.2.	RL co-funding funds					
G.1.3.	Other international funding					
G.1.4.	Special programme funds for covering funding-ineligible VAT					
G.2.	Own funds					
G.2.1.	Public funds (state, municipal budget, other source of public funding)					
G.2.2.	Private funds (own, other private funds)					
G.3.	Loans					
G.3.1.	Loans					
G.3.2.	Loan repayments (except for interest)					

Characteristic of public services is the fact that investment directed at improving the qualitative parameters of a public service determines the growth of demand for public financing at the end of the project investment period.

Once project financing is entered into the appropriate fields, the calculator will calculate the demand for public fund over the entire project time horizon.
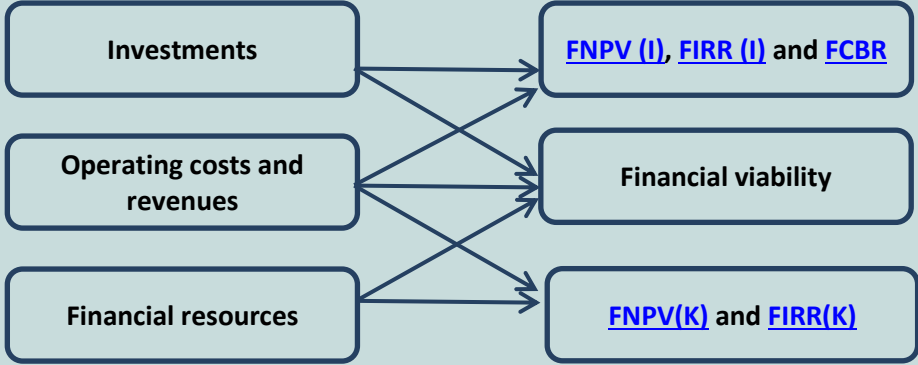
4.4. Calculate the financial indicators

Consider whether the project owner has the capacity to finance this project and ensure its continuity. The calculator presents information in real numbers, i.e., when evaluating your financial capabilities, you must take into account probable changes to project cash flows.

Main results of the financial analysis:
4.4.1. investment indicators (FNPV(I),FIRR(I) and FBCR),
4.4.2. conclusion regarding financial viability,
4.4.3. Capital indicators (FNPV(K) and FIRR(K)), and
4.4.4. comparison of indicators.

Present principal conclusions based on the value of the FNPV(I) or a combination of all the indicators. When calculating different indicators, incorporate the different cash flows presented in this section.

Figure 2.1. Calculating financial indicators

4.4.1. FNPV demonstrates the benefit generated by the project, expressed in present cash value. You can calculate this indicator by adding the discounted net cash flow over the entire project time horizon.

Formula 2.2. Financial net present value of the investment

$$\text{FNPV} = \frac{PS_0}{(1+i)^0} + \frac{PS_1}{(1+i)^1} + ... \frac{PS_t}{(1+i)^t},$$

where $PS_{0,1,...,t}$= the net cash flow of a corresponding year, i = discount rate, t = the corresponding year

The FNPV is calculated in the calculator by using the following function:
NPV (Rate; Value 1, Value 2,... Value N),
where Rate = discount rate, and Value 1, Value 2,... Value N = the value of net cash flows every year of the project time horizon.

FNPV(I) is calculated for the purpose of evaluating projected investment benefit today, i.e., NPV demonstrates whether investing in the project is worthwhile. FNPV(I) demonstrates the financial benefit that the project investments help generate over the course of the project time horizon and how much this benefit is worth today.

If the FNPV(I)< 0, the discounted net revenue flows of the project will not cover the discounted investments and the project will not break even over the project time horizon and therefore, the IP will not produce financial benefit.

If the FNPV(I)> 0, the discounted net revenue flows of the project will cover the discounted investments and the project will be financially appealing to investors. In other words, there will be a return on investment and the financial benefit of the project will cover the invested funds.

If the FNPV(I) of all the IP implementation alternatives turns out negative, the most suitable alternative will be the one that has the FNPV(I) value that is closest to zero.

FIRR is the discount rate at which the net present value of investment, residual investment value, operating revenue and operating cost cash flows are equal to zero. If the FIRR is greater than interest rates in the market, the IP will produce more benefit than the cost of borrowing funds. A very low or even a negative FIRR does not necessarily mean that the project will be ineffective.

Formula 2.3. Financial internal rate of return

$$FNPV = \frac{PS_0}{(1+FIRR)^0} + \frac{PS_1}{(1+FIRR)^1} + ... \frac{PS_t}{(1+FIRR)^t} = 0,$$

where $PS_{0, 1, ..., t}$ = the net cash flow of a corresponding year, t = the corresponding year.

The FIRR is calculated in the calculator by using the following function:
IRR (*Value 1:Value N*),
where *Value 1* = the value of net cash flows in the first year of the time horizon, and *Value N* = the last year of the time horizon.

FIRR(I) is evaluated together with the FNPV(I). If the FNPV(I) has a very negative value, the FIRR(I) is typically not calculated.

If the calculated FIRR(I) is greater than the average market interest rate, the financial benefit produced by the IP will be greater than the cost of funds borrowed for the implementation of the IP.

If the project generates revenues, calculate the financial cost/benefit ratio (FBCR).

Formula 2.4. Financial cost/benefit ratio

$$FCBR = \frac{VPPS}{InPS - LPS + VIPS}$$

$$VPPS = VPPS_0 * \frac{1}{(1+i)^0} + VPPS_1 * \frac{1}{(1+i)^1} + ...VPPS_t * \frac{1}{(1+i)^t}$$

$$InPS = InPS_0 * \frac{1}{(1+i)^0} + InPS_1 * \frac{1}{(1+i)^1} + ...InPS_t * \frac{1}{(1+i)^t}$$

$$LPS = LPS_n * \frac{1}{(1+i)^n}$$

$$VIPS = VIPS_0 * \frac{1}{(1+i)^0} + VIPS_1 * \frac{1}{(1+i)^1} + ...VIPS_t * \frac{1}{(1+i)^t}$$

where VPPS0,1,...,t = the net cash flow of operating revenues for the corresponding year;

InPS0,1,…,t = the net cash flow of the investment for the corresponding year;

LPSn = the net cash flow of residual value for the last year;

VIPS0,1,…,t = the net cash flow of operating costs for the corresponding year;

t = the corresponding year;

n = the last year of the project time horizon;

i = discount rate.

In the calculator, investment indicators are calculated based on the procedure described in this section and the project cash flows provided by you.

If you are preparing a PPP **investment project**, i.e., in the prerequisites sheet of the calculator you indicated that the **IP** is to be implemented according to the PPP method, the calculator will generate the additional worksheet 6.1. and calculate cash flows for financial analysis indicators of investments and investment indicators that can conveniently be used in order to calculate maximum public sector liabilities.

Table 2.9. Financial indicators of investments

		Project time horizon				
		0	*1*	*2*	*...*	*N*
A.	Total investment					
B.	Residual value of investments					
C.	Total operating revenues					
D.1.	Operating costs					
	This net cash flow is used to calculate investment indicators -(A.)+(B.)+(C.)-(D.1.)					
	FNPV(I)					
	FIRR(I)					
	FBCR[6] *The following formula is used for calculation:* $$\frac{(C.)}{(A.)-(B.)+(D.1.)}$$					

4.4.2. Plan the IP so that there are no interruptions of activity due to a lack of funding at any stage of IP implementation , i.e., so that the cumulative net cash flow is not negative in any year of the project time horizon. The accumulated net cash flow demonstrates whether the income planned for the project time horizon will cover the costs of the corresponding period. Take note of the fact that the net cash flow of a given year can be negative, however, the accumulated net cash flow of a given year cannot be negative.

When accumulating cash flows, transfer the net cash value of each year to the following year. The accumulated net cash flow is used to evaluate whether the project organisation can provide the cash flow the implementation of the project needs over the entire course of the project time horizon. The project organisation must evaluate funding needs and secure financial resources to satisfy them.

In the calculator, the conclusion regarding the financial viability of the project is presented based on the procedure described in this section and the project cash flows presented by you.

Table 2.10. Financial viability

		Project time horizon				
		0	*1*	*2*	*...*	*N*
A.	Total investment					

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[6] Before calculating the indicator, discount the flow of each year (in rows D.1., E., F. and G.)

		Project time horizon				
C.	Total operating revenues					
D.	Total operating and financial costs					
E.	Taxes					
G.	Total funding					
Financial viability is calculated using the following net cash flow -(A.)+(C.)-(D.)-(E.)+(G.)						
Accumulated net cash flow (NCF) (NCF of the current year + the accumulated NCF of the previous year)						

4.4.3. The FNPV(C) demonstrates the financial benefit generated over the course of the project time horizon by the owner's invested capital. When the project organisation plans to implement an IP in the public sector and the project organisation is an entity of the public sector, the project owner is the state of Lithuania because state budget funds are contributed towards the implementation of the IP.

If the FNPV(C)< 0, then the implementation of the IP is not financially beneficial to the project owner because the cash flows of the IP do not cover the owner's contribution.

If the FNPV(C)> 0, then the implementation of the IP is financially beneficial to the project owner because the cash flows of the IP cover the capital the owner has invested in the project.

FIRR(C) is evaluated together with the FNPV(C). If the FIRR(C) is greater than the average interest rate in the market, the IP will produce more benefit than the cost of borrowing funds.

When calculating capital indicators, public funds and own private funds should be viewed as the project implementation costs incurred by the state or the project owner, therefore, these sums should be subtracted from the net cash flow used to calculate capital indicators.

In the calculator, capital indicators are calculated based on the procedure described in this section and the project cash flows provided by you.

Table 2.11. Financial indicators of capital

		Project time horizon				
		0	*1*	*2*	*...*	*N*
B.	Residual value of investments					
C.	Total operating revenues					
D.	Total operating and financial costs					
G.1.2.	*RL Co-funding*					
G.2.1.	*Public funds*					
G.2.2.	*Private funds*					
G.3.2.	Loan repayments (excluding interest)					
Net cash flow used to calculate capital indicators (B.)+(C.)-(D.)-(G.1.2.)-(G.2.1.)-(G.2.2.)-(G.3.2.)						
FNPV(C)						
FIRR(C)						

4.4.4. Once you have calculated the financial indicators for each alternative, enter the results into the general table and present a well-grounded conclusion

regarding which IP implementation alternative can be distinguished as the comprehensively superior option.

An IP implementation alternative can be considered comprehensively superior if it meets at least one of the following criteria:

    a) this is the only alternative that has a positive FNPV(I);

    b) the FNPV(I) of the alternative is 10% higher than that of other alternatives;

    c) you have other kinds of evidence to substantiate the superiority of this alternative.

Table 2.12. *Comparison of the financial indicators of project implementation alternatives*

	Financial analysis indicator	Project implementation alternative			
		1	*2*	*n*	*Conclusions*
1.	FNPV(I)				
2.	FIRR(I)				*Conclusions regarding the financial indicators of alternatives*
3.	FBCR				
4.	Conclusion regarding financial viability				
5.	FNPV(C)				
6.	FIRR(C)				

Once you have completed the financial analysis of the project, do not transfer the information and data to the descriptive section of the IP, but rather prepare a brief summary of the analysis (up to 1,500 symbols), which you will later incorporate in the project summary according to the procedure set out in Section 7.6, and which should present the discounted and non-discounted values of the main financial cash flow (investments, residual investment values, operating revenues, operating costs, taxes and financing), the values of calculated financial indicators and a conclusion regarding the financial viability of the project.
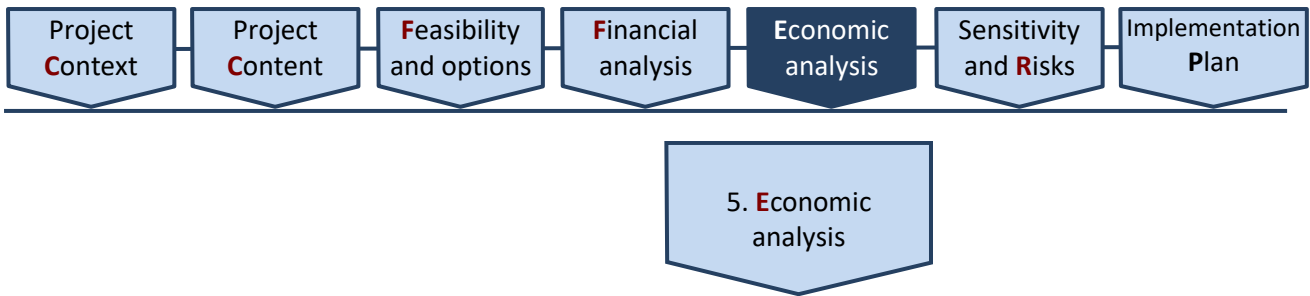
5. **E**conomic analysis

In the economic analysis, evaluate the project's contribution to the economic welfare of the region or the entire country. The limits of the impact assessment depend on the specific project: if you wish to use the project to resolve regional problems and IP activities are only developed for regional target groups, then the economic analysis should be limited to a regional impact assessment. The widest possible limits for a economic analysis include the entire public of Lithuania. However, when conducting a national-scale impact assessment, impact is not typically assessed for all the residents across the country, but rather for a smaller representative segment that is identified based on certain demographic characteristics (e.g., age, education, place of residence, etc.). In other words, the project's influence on the general public is typically narrowed down to its influence on the project target groups. The impact assessment is the aspect that most clearly separates the financial analysis from the economic analysis: the financial analysis is used to examine changes in cash flow within the project organisation, whereas the economic analysis focuses on changes the project produces in society.

If the financial analysis fails to identify a comprehensively superior IP implementation alternative, you must conduct an economic impact assessment with all of the project alternatives.

If the financial analysis clearly establishes a single front-runner among the alternatives, only conduct an economic assessment of this IP implementation alternative.

The main result of the economic analysis is the ENPV, EIRR and EBCR of the alternative. These economic indicators are calculated by discounting economic cash flows using the social discount rate.

The cash flows of the financial analysis are used in the project's economic analysis, conducted in the following order:

5.1. Convert market prices into economic prices;

5.2. Indicate the social discount rate;

5.3. Evaluate external impact;

5.4. Calculate economic indicators;

5.5. Select the most appealing alternative

5.1. **Convert** market prices into economic prices

The cash flow value calculated in the financial analysis is ordinarily affected by an imperfect competitive and tax environment as well as various other factors. Because of these factors, the cash flows calculated in the financial analysis do not reflect the fair value of funds. Therefore, the economic analysis should use economic (rather than financial) cash flows, which are calculated by adjusting the cash flows of the financial analysis with the appropriate conversion factors.

This operation is known as conversion. The aim of conversion is to recalculate the financial cash flows of the project into economic cash flows. Conversion coefficients are determined by evaluating the following factors that influence financial flow values:

1. distortions of financial cash flows due to the existence of an imperfect market: customs duties, quotas, other trade restrictions, monopolies, the lease of state assets below market price, etc., all produce price distortions;

2. the fact that labour remuneration costs do not directly reflect the added value they generate: subsidies, labour exchange payments, commitments to protect jobs, etc. mean that remuneration costs do not correspond to the added value they generate. These wage deviations can also be caused by the following:

2.1. the wages of employees (especially with higher qualifications) are often lower than those earned by private sector employees for similar work;

2.2. the minimum wage regulated by legal acts has an influence on wage size.

During the conversion process, use the same financial cash flows that were used for calculating the FNPV(I) and FIRR(I). Conversion factors are applied in the following way:

a) VAT is subtracted if it was included in the cost price of investments, goods or services, as are customs duties, excise duties and subsidies;

b) different conversion factor values are applied to each product and service group based on their economic activity sector.

When preparing the economic analysis, enter information about the main and (if necessary) additional economic activity sectors of the main investment object in the general prerequisites sheet of the calculator. Based on the information presented for this question, the calculator will select the appropriate conversion factors, which will then be applied to separate financial flows in order to convert them into economic cash flows. The sector-specific conversion factor values applied to projects implemented from 2015 and onwards are presented in Section 5, and the methods for calculating conversion factors are presented in the *Methodology for Calculating Conversion Factors and Economic Cost/Benefit Estimates*.

5.2. Nurodykite socialinę diskonto normą

Use the social discount rate (SDR) to calculate economic indicators. The SDR reflects public opinion on future benefits and costs. This is the price that society pays by delaying consumption today for consumption in a year (in the future). On the one hand, it demonstrates the benefit that the public expects to receive if it postpones consumption to the future, i.e., it reveals how much the public cares about welfare in the future.

A high SDR means that the public is relatively unwilling to invest significant resources (for example, capital) in order to generate greater welfare for future generations and prioritises present-day consumption and short-term investments (projects). A low SDR indicates the opposite – the public is more inclined towards long-term investment.

The SDR for investment projects implemented in Lithuania can be set by a separate legal act passed by the Ministry of Finance. If such a legal act is passed, the SDR established by the Ministry of Finance should be used when conducting the economic analysis. As long as the SDR has not been set on the state level, apply a 5% SDR in your economic analysis.

5.3. Assess external impact

When determining external impact, evaluate the economic cost/benefit generated by an IP. Take into account all of the circumstances of the economic impact of an IP that have a direct effect on the project target groups and groups in the external environment.

Economic benefit (cost) is evaluated in monetary value in this order:

5.3.1. select benefit and cost components of IP impact for evaluation;

5.3.2. Determine the scale of impact that the costs and benefits generated by the project has on the target group you defined in Section 2.4.

5.3.1. Determine evaluated economic cost and benefit components by taking into account the economic activity sector of the IP, the nature of the project and its specifics. The *Methodology for Calculating Conversion Factors and Economic Cost/Benefit Estimates* provides a detailed explanation of how components of economic benefit (cost) are identified and calculated, as well as which components

should be used with certain project types. Section 6 presents estimates for economic benefit (cost) components for the entire project evaluation period according to each sector.

In the alternative analysis sheets of the calculator, use rows H.1.1–H.1.7 and H.2.1–H.2.3 to select the external economic impact components that best reflect the project impact. The calculator suggests components depending on the types of projects selected for the economic activity sector in the prerequisites sheet. If cost components cannot be selected in row H.2, this means that there are no cost assessment components for the project types of the economic activity sector you have selected in the prerequisites sheet of the calculator (sheet 1).

Once you have selected your components, use them to evaluate economic impact for every year by calculating it according to the provisions laid out in the *Methodology for Calculating Conversion Factors and Economic Cost/Benefit Estimates*.For projects implemented in 2015 and onwards, relevant component value estimates are presented in Annex 6. You can also find these estimates presented in a more convenient MS Excel file that you can access at www.ppplietuva.lt. The estimate calculation instructions for components that have to be estimated separately and components for which estimates have already been calculated are presented in the "Calculation methodology and calculated estimates" section of the said methodology.

5.3.2. Once you have determined the cost and benefit components that best reflect the economic impact of the project, calculate the scale of impact for the target group defined in Section 2.4.

Indicate the economic benefit (cost) of each alternative in rows H.1. and H.2. of the calculator. Express both economic benefit and costs as positive whole numbers. Express a decrease economic cost or benefit with negative whole numbers.

Economic benefit (cost) is calculated by multiplying the estimated value of the SE impact component by the size of the target group / the scale of impact. Detailed instructions on how to calculate every benefit and cost are provided in the "Instructions for application" sub-sections that describe every component of each economic activity sector in the *Methodology for Calculating Conversion Factors and Economic Cost/Benefit Estimates*.

Table 3.13. Economic cost/benefit of the project

		Project time horizon				
		0	1	2	...	N
H.1.	Economic (SE) benefit (financial)					
H.1.1.	E.g., an increase in the average life span for 50 individuals					
H.1.2.	E.g., improvement in the health of employed individuals					
H.2.	Economic (SE) cost (financial)					
H.2.1.	E.g., An increase of 10 tonnes in air pollution due to increased traffic					
H.2.2.	E.g., the decrease of an area's attractiveness for households and business by 1%					

5.4. Calculate the economic indicators

Main results of economic analysis:
5.4 1. ENPV indicator,
5.4 2. EIRR indicator, and
5.4 3. EBCR indicator.

When calculating various indicators, include the different cash flows that are identified in this section.

5.4.1. The ENPV demonstrates the economic benefit that the project will produce in its external environment. Therefore, the ENPV should be used as evidence of the benefit produced by the IP to target groups over the course of the project time horizon, expressed in present value.

If the ENPV < 0, the discounted benefit produced by the IP does not cover discounted costs, thus implementing such an IP would not be worthwhile. If the ENPV > 0, then the project generates added value for society. Accordingly, an IP is economically sound if its ENPV is positive.

Calculate the ENPV once you have evaluated the following:

a) economic cash flows (which you will have calculated by converting financial flows as described in Section 5.1) , and;

b) the economic benefit and cost produced by the project (calculated as described in Section 5.2).

The ENPV is calculated by using the following function
NPV (Rate; Value 1, Value 2,... Value N),
where Rate = social discount rate, and Value 1, Value 2,... Value N = the value of net cash flows every year of the project time horizon.

5.4.2. The EIRR is the discount rate at which the ENPV is equal to zero. Because net cash flows are also discounted when calculating the **ENPV**, the calculated **EIRR** is compared to the **SDR** applied in the calculation of **ENPV**. The EIRR of an IP that generates significant economic benefit is typically higher than the SDR applied.

The EIRR is calculated by using the following function
IRR (Value 1:Value N),
where Value 1 = the value of net cash flows in the first year of the time horizon, and Value N = the last year of the time horizon

5.4.3. The EBCR is the most important indicator of the economic analysis and reflects the number of times the benefit generated by the project is greater than its costs. Calculate EBCR by dividing the economic benefit of the IP by its economic costs.

Economic benefit is equal to the sum of converted and discounted operating revenues (C.) and economic benefit (H.1.).

Economic costs are equal to the sum of converted and discounted investment costs (A.), minus the converted and discounted residual investment value (B.), and the converted and discounted operating costs (D.) as well as the economic costs (H.1.).

The EIRR of any public investment project must always be greater than 1.

Economic indicators are calculated by the calculator based on the procedure described in this section and the project cash flows provided by you.

Table 3.14. Economic indicators of the project

		CF	Project time horizon				
			0	*1*	*2*	*...*	*N*
A.	Total investments of alternative						
B.	Residual value of investments						
C.	Total revenues						
D.	Total operating and financial costs						
H.1.	SE benefit (financial)						
H.2.	SE cost (financial)						
Apply the following net cash flow (NCF)[7] to calculate economic indicators $-(A.)+(B.)+(C.)-(D.)+(H.1.)-(H.2.)$							
ENPV							
EIRR							
EBCR[8] *The following formula is used for calculation:* $$\frac{(C.) + (H.1.)}{(A.) - (B.) + (D.) + (H.2.)}$$							

5.5. Choose the most suitable alternative

Once you have calculated the economic indicators for each alternative, present the results in the general table. Present your final conclusion regarding the most attractive (optimum) alternative by comparing the evaluated alternatives based on their financial indicators (Section 4.4.) and their economic indicators (Section 5.4.).

Table 3.15. Comparison of the economic indicators of project implementation alternatives

	Economic analysis indicator	Project implementation alternative			
		1	*2*	*n*	*Conclusions*
1.	ENPV				*Conclusions regarding the economic indicators of alternatives*
2.	EIRR				
3.	EBCR				

Because public IPs typically do not break even financially and are only beneficial from the economic perspective, view indicators of the economic analysis as the main criteria for comparing alternatives. When comparing alternatives based on their economic indicators, place the most importance on the ENPV of the alternative, followed by the EBCR and, finally, the EIRR.

The IP implementation alternative that is selected has to be financially viable (the net cash flow accumulated over every year of the project time horizon cannot be negative) and generate the greatest economic benefit. In addition to this, the EBCR of a public investment project must be greater than 1.

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[7] Before calculating the NCF, convert the financial cash flows (in rows A., B., C. and D.) by using the individual conversion factor (CF) set for each row.

[8] Before calculating the indicator, convert the financial cash flows (in rows A., B., C. and D.) by using the individual conversion factor (CF) set for each row and discounting each flow (in rows A., B., C., D., H.1. and H.2)

Once you have completed the economic analysis, prepare a short description of the results (up to 1,500 symbols), which you will later include be able to include in the project summary according to the guidelines set out in Section 7.6, and which should cover the following: conversion operations completed, external impact elements, the SDR applied, economic indicator values and the selected IP implementation alternative.

6. Sensitivity and **R**isks
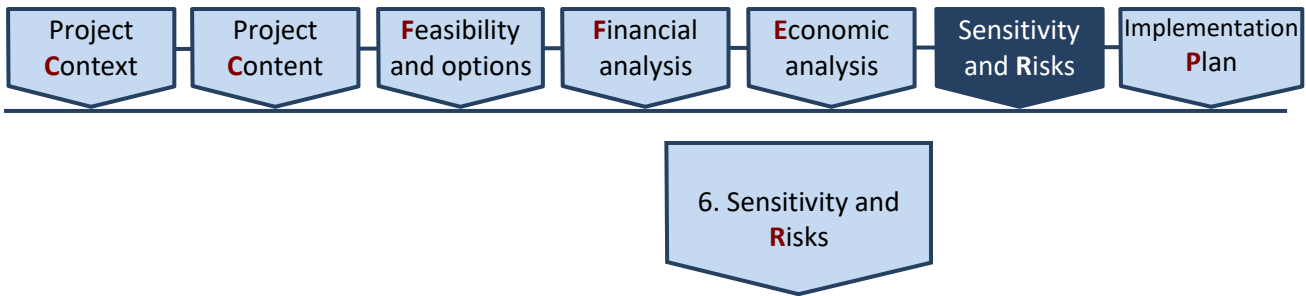
Scope: no restrictions.

Projects are planned based on projections for principal project parameters, therefore, this is not simply a case of forming subjective opinions about the project. Because project planning and preparation is an activity that seeks to project future financial flows, it is likely that projection errors and inaccuracies may occur. Projection errors and inaccuracies are often the result of insufficient historical data, which is especially relevant in the case of innovative and unprecedented projects. The manifestation of subjective, unplanned and objectively unidentifiable factors is also likely, for example, incidents of corruption during the implementation of the project.

The probability that a certain event will negatively (or positively) influence the implementation of an IP is called a risk. Risk is also defined as any factor, event or effect that has a negative (positive) influence on the successful implementation of an IP by the established deadline, without exceeding the predefined amount of costs and to an appropriate standard of quality.

Analyse and evaluate risk factors that have an influence on the IP, prepare a risk management plan, provide for essential resource for managing them and evaluate the effect a risk may have on project finances. Traditionally, errors and inaccuracies in projecting project parameters, as well as the risks that influence them are grouped into different categories based on their causes and other distinguishing properties. Depending on the project type, each risk can manifest varyingly in different projects. For example, on a project designed to be complete within a single year, construction activity planned for 11 months poses a significant threat to the implementation of the project due to the risk of construction delays.

When preparing this section of the IP, it is important to present a systemic understanding of the potential risks a specific project faces and to evaluate the potential effect of these risks on the successfulness of project implementation. Sometimes, in the course of analysis, it becomes apparent that the same risks can have very different effects depending on the point of the project implementation period (project planning, execution or evaluation).

Evaluate risk for every IP in the following order:
6.1. Conduct a sensitivity analysis;
6.2. Conduct a scenario analysis;
6.3. Determine variable probabilities;
6.4. Assess risks;
6.5. Assess the acceptability of risk;
6.6. Plan risk management actions.

6.1. Conduct a sensitivity analysis

The sensitivity analysis should only be carried out for projects with a budget of over EUR 3 million. If the project budget does not exceed EUR 3 million, consider the ten variables that generate the greatest discounted project cash flows to be critical.

The sensitivity analysis reveals how changes in each individual variable influence the results of the IP.

Conduct the sensitivity analysis by changing the preconditions for each variable value and observing how this change influences financial (FNPV(I), FIRR(I)) and economic indicators (ENPV, EIRR). Only change the value of one variable at a time and do not change other variable values.

The result of the sensitivity analysis is a list of critical variables and their breaking points as well as a chart that depicts the influence of critical variables. Compile this list once you have conducted a sensitivity analysis of all the variables.

If a 1% change in the value of a variable affects the FNPV(I), FIRR(I), EIRR or ENPV more than 1%, then this variable should be viewed as critical. If you have considered the specific nature of the IP (e.g., if there is a large number of variables that all have a small influence on the result), you can also apply a < 1% change in order to identify the variables as critical.

Conduct the sensitivity analysis in the following order:
6.1.1. identify variables,
6.1.2. eliminate variable interdependence,
6.1.3. conduct an elasticity analysis, and
6.1.4. identify critical variables and their break points.

6.1.1. The variables of every IP can be categorised as:
a) general: general preconditions of the financial model applied to the project (FDR, SDR, project time horizon);
b) direct: project investment flows (A.1., A.2., A.3., A.4., A.5., A.6., A.7., A.8.), residual investment value (B.), operating revenues (C.1., C.2., C.3.), operating and financial costs (D.1., D.2.), taxes (E.1., E.2., E.3.), financial value of economic impact (H.1., H.2., ..., H.n.);
c) specific: variables related to the specific activity characteristic of an IP or the peculiarities of implementing a specific IP (e.g., number of services users, income (service) rates, service price, average wage, number of individuals employed, price of energy, energy consumption, rental price of construction equipment).

6.1.2. Individual specific variables can be part of the same direct variable, and this can distort the results of the sensitivity (scenario) analysis, therefore, variables that are not interdependent must be used. Variable dependence in individual financial and/or economic flows can be eliminated by selecting:
a) only specific variables that affect direct variables (for example, operating revenues are a direct variable, but the number of services (goods) and/or their price are components of operating revenue, and both variables can be critical in their own right);
b) only direct variables, i.e., variables that are more significant than compound variables, which are affected by specific variables.

6.1.3. The elasticity analysis reveals how changes in each individual variable influence the results of the IP. Conduct the elasticity analysis in the following order:
a) if necessary, (e.g., if there is a large number of specific variables), conduct a qualitative elasticity analysis. The result of the analysis is a list of variables that have a significant influence on financial and economic indicators. Use those variables that were attributed financial expressions in the previous stages. The purpose of a qualitative elasticity analysis is to reduce the number of variables analysed in the quantitative elasticity analysis,
b) conduct the quantitative elasticity analysis by separately changing the value of each variable by a percentage of your choice and observing how this affects the financial (FNPV(I), FIRR(I)) and economic (EIRR, ENPV) indicators of the project. Record indicator changes in absolute values or percentages. Take note that indicator changes might not graph in a line and thus calculations should be made with no less than 10 different values for each variable.

6.1.4. Once you have evaluated the results of the elasticity analysis, identify critical variables that produce more than a 1% change in a single financial or economic indicator value if the value of the variable itself changes by 1%. Critical variables typically directly influence the main financial flows: investments,

operating revenues, operating costs, etc. Ordinarily, the number of critical variables should not exceed ten.

Present the results of the sensitivity analysis graphically. A graph of successful sensitivity analysis results should resemble a curve that depicts the influence critical variables have on financial (FNPV(I), FIRR(I)) and economic (EIRR, ENPV) indicators.

Calculate break points for critical variables. A break point is the value of a critical variable at which the ENPV equals zero or, in other words, when the economic benefit of the project no longer reaches the minimum acceptable value at which the net present value of project costs is equal to the benefit generated.

The break point of a critical variable is used to determine the variables that carry the greatest risk, to evaluate the riskiness of the project and provide more information about potential risk management measures.

The calculator conducts an elasticity analysis of all the direct variables that have been financially expressed and produces the results of this analysis when the user activates it.

6.2. **Conduct** a scenario analysis

The scenario analysis is a special type of sensitivity analysis. A standard sensitivity analysis examines the influence each indicator has on project indicators.

Meanwhile, a scenario analysis is used to examine the general influence of critical variables on financial (FNPV(I), FIRR(I)) and economic (EIRR, ENPV) indicators. Conduct the analysis by using a hypothetical pessimistic scenario and a hypothetical optimistic scenario (analyse three to five possible scenarios). Optimistic and pessimistic values allow you to model IP indicators in order to assess the general riskiness of an IP. Calculate the financial and economic indicators for each combination of critical variable values (for each scenario).

The calculator analyses a total of five scenarios: 1) pessimistic; 2) less pessimistic; 3) realistic; 4) less optimistic, and; 5) optimistic. When the user activates the analysis, the calculator opens up a data input window for scenario settings. The most likely value is denoted as 100% and, accordingly, lower or higher percentages indicate the change of a direct variable in one direction or another for each scenario.

If you wish to change the default scenario settings, you can do so, however, you must then explain the reasoning behind such a correction in the investment project.

Do not view sensitivity and scenario analysis as an alternative to risk analysis because these are simply intermediary stages in the evaluation of IP risk.

6.3. **Determine** variable probabilities

Sensitivity and scenario analysis does not take into account the probability that a variable can to a certain extent affect IP indicators in reality. In other words, a change of a variable value by a relative percentage does not necessarily express the probability that the variable will change by this exact percentage.

Thus, a distribution of probabilities must be attributed to each variable, i.e., a list (graph) of possible variable values and the probability of each value. Consider the variable value indicated in the IP implementation alternative of your choice the most likely variable value.

You can create a distribution of probabilities for each variable based on different sources such as experimental data, historical data from similar projects as described in literature and expert consultation. It should be clear that if the process of examining probability distribution data is not reliable, the risk assessment becomes irrelevant. However, even when the most simple form is applied (e.g., a

triangular distribution), this operation demonstrates the stronger and weaker aspects of the project, which can then be compared to the basic scenario.

In certain cases (for example, if not enough data is available about previously implemented projects of a similar nature), providing appropriate distribution data (distribution type and parameters) for variable probability distributions might be a rather difficult task. In such cases, at least conduct a qualitative risk assessment in order to underpin the results of the sensitivity analysis.

CPMA experts conducted various analyses and established the most likely probability distributions and parameters for each variable, thus the most likely probability distribution and parameter value is set by default for each direct variable in the IP calculator.

If a user (e.g., in consideration of the operations carried out according to Section 6.6) does not wish to use the default distributions and/or their parameters, then the probabilities of risk variables can be calculated independently, presenting alternate probability distributions and/or their parameters in a separate file. When choosing to use alternative distributions and/or parameters, explain your course of action and why you have made such a decision (e.g., because specific risk management actions were selected, or because of a scientific (experimental) study (article), etc.). Also explain the reasoning behind the alternative distributions you propose and your choice of parameters. Your explanation must be supported by at least one of the following sources: the results of a scientific study, a scientific article, research reports, historical (empirical) data, the results of a survey of experts.

If the sources you use in your explanation are not freely accessible online, then the most important aspects and results of the methodology underpinning the choice of distribution and parameters should be described in the IP.

6.4. Assess risks

Conduct the risk assessment in the following order:
6.4.1. determine risk measurements for each (direct) variable;
6.4.2. distribute risk measurements across respective risk groups;
6.4.3. add the measurements attributed to each risk group.
6.4.4. distribute the measurement value of each risk group over the years of the project time horizon

6.4.1. For every risk measurement of a critical (direct) variable, choose the lowest value that (according to the data of the cumulative probability curve) the critical (direct) variable will not exceed 70% of the time.

You can calculate the risk measurement (absolute number) of a critical (direct) variable by subtracting the value of the corresponding critical (direct) variable planned in the project budget from the value you have chosen (if the value is negative, use the absolute value).

If, according to the procedure established in Section 6.1, you have chosen specific variables as your critical variables, view them as risk factors in the context of risk assessment, and determine the risk measurement of the related direct variable:

a) if a direct variable is influenced by a single specific variable, apply the probability distribution of the specific variable to the direct variable and choose the lowest value based on the procedure described in this section,

if a direct variable is influenced by more than one specific variable, you will be able to find the probable distribution of the direct variable's values (the cumulative probability curve) by applying the Monte Carlo method[9], and calculate

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[9]The Monte Carlo method is a method used in applied statistics based on the simulation of possible process (algorithm) results. The method is applied in 3 steps: 1) a domain of possible variable inputs is defined; 2) random variables within

the risk measurement of the <u>direct</u> variable based on the procedure described in this section. The Monte Carlo statistical distribution method repeatedly samples (simulates) random values of specific variables from the interval (distribution) defined in <u>Section 6.3.</u> and calculates the values of the <u>direct</u> variable.

The calculator calculates estimated risk values for every direct variable without the need for any additional operations. <u>IP</u> risk measurements are presented on Sheet 5.1. of the calculator.

If you are preparing a PPP investment project, i.e., in the prerequisites sheet of the calculator you indicated that the IP is to be implemented according to the PPP method, the calculator will generate the additional worksheet 6.2. and automatically calculate risk measurements and discounted financial risk values, which can then conveniently be used to calculate maximum public sector liabilities.

If, as described in <u>Section 6.3</u>, you are using distributions and/or parameters that are not the default option, you must calculate risk measurements yourself in the same file that you used for calculating and presenting custom distributions according to the procedure described in this section.

6.4.2. Once you have established the risk measurements of the <u>direct</u> variables, consider the risks that could possibly emerge during the project. There are 8 risk groups:
1. Risks associated with the quality of design (planning);
2. Risks associated with the quality contracting work purchased (conducted);
3. Risks associated with the quality of services purchased (provided);
4. Risks associated with the quality of purchased (manufactured) equipment, devices or other property;
5. Risks associated with insufficient funding;
6. Risks associated with the suitability of products (services) introduced in the market;
7. Risks associated with market demand for products (services) provided;
8. Risks associated with the residual value of assets at the end of the project time horizon.

All of the risk groups are discussed in more depth in <u>Annex 7</u>, which lists risk factors for each risk group. When evaluating project risks, you should consider and evaluate whether a specific risk factor has influence on the project and how this influence can be minimised and managed.

When evaluating potential project risks, the following risk measurements of <u>direct</u> variables are attributed to each risk group based on the nature of how the risk manifests itself:
1. Risks associated with the quality of design (planning) – direct variables: design and technical maintenance services as well as other services related to investment in long-term assets, project administration and implementation.
2. Risks associated with the quality contracting work purchased (conducted) – direct variables: land, real estate, construction, reconstruction, renovation, other work.
3. Risks associated with the quality of services purchased (provided) – direct variables: other services and costs.

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this domain are generated and calculations are made for the indicators being assessed with selected variable values; 3 the results of individual calculations are aggregated. The aggregated results create a statistical distribution curve that, in risk analysis, reflects the probability curve of the risk impact analysed.

4. Risks associated with the quality of purchased (manufactured) equipment, devices or other property – direct variables: equipment, devices, other assets.
5. Risks associated with insufficient funding – direct variables: loan interest.
6. Risks associated with the suitability of products (services) introduced in the market – direct variables: operating costs (except for loan interest).
7. Risks associated with market demand for products (services) provided – direct variables: revenues.
8. Risks associated with the residual value of assets at the end of the project time horizon – direct variables: residual investment value, reinvestments.

6.4.3. Once direct variable risk measurements have been attributed to each risk group, the risk measurements of each group are totalled up. Thus, the potential risk value of each risk group is calculated.

The calculator automatically attributes risk measurements to corresponding risk groups and calculates the value of potential risk in each risk group.

If the risk assessment calculations were made in a separate file (e.g., because the applicant chose to use alternative distributions and/or parameters), then risk measurements should be attributed to the appropriate risks and risk values should, accordingly, be calculated as described in Section 6.3 and Section 6.4.

6.4.4. Based on the years of the project time horizon, distribute the risk measurements proportionately across the cash flow of the direct variable influenced by this risk group. If you believe that the impact of a certain risk group has a different distribution over time, describe this distribution and why you have chosen to use it.

6.5. Evaluate the acceptability of risk

Typically, project CBA indicators are calculated by evaluating the most likely measurement, however, the main criterion for identifying values that determine project suitability should be the probable value of these indicators. Indicator value calculations are based on the data of probability distributions of critical variables that influence them. Such a method allows the prioritization of projects that have the best most probable ENPV outcome, the evaluation of associated risks and the comparison of different cases.

When conducting project evaluations with this method, it is important to assess the potential compromise between high-risk projects that generate significant social benefit and less risky projects that generate less economic benefit.

We recommend a neutral perspective on markets, as the public sector can group and/or diversify risks, thus reducing them, and implementing a great number of projects. In such cases, the ENPV describes risk measurement. In some cases, the project organisation might stray from a neutral position and offer a project with a higher or lower potential risk, but such decisions must be well-grounded and clearly explained.

Evaluate risk acceptability by:
a) using the Monte Carlo method. Based on this statistical model, random critical (direct) variable values are repeatedly sampled (simulated) from the interval (distribution) defined in Section 6.3 and Section 6.4.1, and the values of the IP's financial and economic indicators are calculated.

Once this process is repeated approximately a thousand times (the greater the number of simulations, the greater the accuracy of the results), present the results of the Monte Carlo method (the likely distribution of FNPV(I), FIRR(I), ENPV and EIRR indicator values) in graphic (e.g., as a cumulative probability curve) and numerical form (e.g., a table of values).

b) for every indicator, clearly specify the probability that the value of the indicator will not be acceptable (negative or lower than the value you indicated as desired),

c) explain whether such a negative (or lower than desired) probability of results is acceptable, and

d) determine the most likely values of the financial (FNPV(I), FIRR(I)) and economic (ENPV, EIRR) indicators.

The calculator automatically calculates the indicators used to assess the acceptability of risk, if the user initiates the process.

6.6. Plan
risk management actions

Choose the most effective method for managing each project risk. The main methods of managing risk are:

1) risk avoidance: the cause(s) of a risk are eliminated, thus the probability of the risk occurring disappears altogether,

2) risk prevention: the probability of the risk is reduced or the potential effect of the risk on project results is mitigated by implementing preventive measures or investing more funds into the creation of infrastructure,

3) risk insurance (the transferral of financial risk to an insurer): risk insurance is purchased for insurable risks (force majeure risks, construction risks, civil liability risks, etc.),

4) risk transferral: the risk is transferred to a party that is more capable of managing it (for example, the project is implemented with a partner that has experience with managing the relevant risks),

5) risk sharing: the parties define how they will share the positive (negative) impact of a risk occurrence, and

6) risk assumption: the project organisation decides to manage potential risks itself (accordingly, an organisational structure is created within the organisation to distribute responsibility for all possible risks, etc.), only conduct passive risk monitoring activity.

The most common mistake made in the assessment of risks is optimistic bias, i.e., systematically exaggerated optimism in assessing direct variables. In order to minimise optimistic bias, we recommend making special corrections. These corrections can be made by increasing cost values and reducing project revenues or economic benefit or evaluating the project revenues and economic benefit later than planned. The corrections should be underpinned by empirical (experience-based) data from similar projects implemented in the past or based on expert consultations if such historical data about similar projects does not exist.

Optimistic bias corrections enable a more accurate evaluation of the project in the first stages of implementation. These corrections should not be viewed as an alternative risk assessment method, but they can provide a more accurate basis for risk analysis. The risk analysis should be used to formulate a risk prevention strategy, identify specific risks, the probabilities of their occurrence, management methods and third parties that could potentially take over the project risk (for example, insurance companies). Risk management is a difficult task and requires great competence and resources. We recommend entrusting this function to professionals in the field of risk management.

Once you have completed the risk analysis, establish special measures for managing the project risks based on international practices (if possible).

Besides, once you have evaluated possible risk management measures and their influence on the impact and probability of risk (that is once you have evaluated the reduced project risk), consider the possibility of adjusting all of the related direct variable probability distributions and recalculating the risk measurements of direct variables and risk factor measurements. In other words, evaluate whether it would be worth repeating the steps laid out in Section 6.3 and Section 6.4. If risk management measures are linked to the emergence of additional costs, provide for these costs in the appropriate rows of the project budget and repeat the steps laid out in Section 4, Section 5 and Section 6, because the inclusion of risk management costs change the values of individual IP variables.

Once you have conducted sensitivity and risk analyses for the project, prepare a brief description of the results (up to 1,500 symbols), which you will later be able to incorporate in your project summary according to the guidelines set out in Section 7.6, and which should cover the following: critical variables and their breaking points, the results of the scenario analysis, risk measurements for critical variables, risk factor measurements, a description of risk acceptability and selected risk management precautions.

7. Implememtation Plan
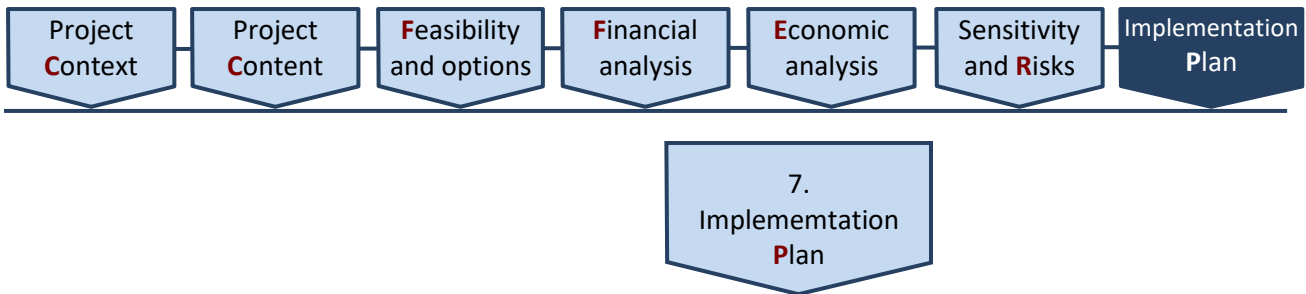
Scope: no restrictions.

In formulating and presenting IP implementation alternatives, the previous sections focused mainly on demonstrating the essence of the alternative. The purpose of this section is to present the selected IP implementation alternative in terms of organisational detail, activity plans and the assignment of roles and responsibilities to specific individuals.

If a project is to be implemented in the sector of information society development and it is designed for developing electronic public services, this section should be used to clearly identify the prep-work that will have to be completed before the electronic services are green-lit for development, how many and what kind of electronic services will be developed, technological development solutions and functional schemes, whether any electronic services will be modernised and the level and scale of the planned upgrade. If a project in this sector is designed to improve an existing information system, use this section to explain precisely what improvements are planned for the information system: present a clear analysis of the links in the information system that will be upgraded and the features that will be developed additionally, highlighting how the improvements will differ from the existing services. This section should also be used to present the structure of the planned information system: describe the components of the information system, the system's compatibility with registers and other information systems, regardless of who they are owned by (i.e., do not limit yourself to the internal organisation). It is important to show how each of the components (sub-systems, modules) of the system being developed are linked to the electronic services.

7.1. Set a project time frame and its stages

Describe the factors that will determine the amount of time it takes to implement the IP and demonstrate how prepared the project organisation is to implement the project, what preparatory actions it has taken and whether it has sufficient knowledge of the market the IP is to be implemented in.

Depict the IP implementation period graphically, indicating specific stages and describing the intended results of each stage in detail.

When setting the implementation period:

a) allocate a sufficient amount of time for the procurement process. Determine the length of the procurement process both based on the procedural time restrictions established by the law (for example, time frames for carrying out preliminary procurement document finalisation procedures established by the CPMA) and the project organisation's experience with procurement procedures,

b) if you have initiated the procurement process before securing funding, you can proceed with procurement procedures at your own discretion, however, you cannot enter into any product or service purchase agreement, **unless you do so at your own risk,**

c) evaluate the time frame for incurring eligible costs indicated in the Project Financing Conditions applied to the project, if you plan to implement the project with financing from the EU Structural Support Fund.

Establish how you will implement project activities by using specialised time and resource management software (e.g., MS Project, OpenProj, Ace Project, etc.). A project implementation plan drawn up using specialised software is a useful tool for carrying out project administration operations, delegating assignments, responsibilities and assessing progress at each stage of the IP implementation process.

7.2. Specify the project location	Present information about where the project is going to be implemented, where the furniture, equipment and other long-term assets purchased as part of the project will be used, describe the infrastructure at the location, whether the location is suitable and convenient for providing public services, how accessibility to the service will be guaranteed, and the criteria that was used in order to select a specific physical location for the project.
7.3. Present the project team	This section of the project should describe how prepared the project organisation is to implement the project, demonstrate that the employees are qualified for such a task and, if necessary, substantiate the necessity for assistance from external experts. Explain how the project organisation will ensure project administration and the supervision of its implementation: 1) what is the intended organisational structure, 2) who is part of the administration team, and 3) what are the duties and responsibilities of each team member
7.4. Describe Project conditions and continuity	Describe project continuity, i.e., indicate the following: 1) how the results produced during the project will be used, 2) how the appropriate use and maintenance of the infrastructure developed will be ensured, and 3) how the operations of the organisation or company will change once the project is implemented.
7.5. Present other conclusions	When formulating other conclusions, briefly provide information about the project: 1) how the problem will be resolved, 2) present the chosen IP implementation alternative, organisational details related to its implementation and planned project activities, 3) present the results of the financial and economic analyses, and 4) any other information you feel is important.
7.6. Prepare a summary of the project	Only write this section of the IP up when you have completed all the other sections. The project summary is an overview of the IP's characteristic features. During project implementation, this summary will typically be used to present and promote the project. Therefore, write the summary by using informative statements and compound sentences that generalise factual information. Limit the summary to 2 pages and write it by using the information presented in the summaries at the end of each IP section. 1) **Project context**. Economic environment, legal framework, target issues, existing needs. 2) **Project content.** Description of the project purpose, links to other projects, project limits, objectives, target groups, project organisation, intended results, duration of the project, stages, activities, conditions and continuity. 3) **Feasibility and options.** A brief description of analysis (potential activities, activity assessment criteria, activity short list, analysis and comparison of alternatives). In addition to this, if certain IP information is not analysed because feasibility studies were conducted to underpin the project, indicate the exact titles of these feasibility studies and, if possible, attach these feasibility studies to the IP as an annex. 4) **Financial analysis.** A description of analysis results (project time horizon, FDR applied, total discounted and non-discounted amounts of principal financial cash flows (investments, residual investment value, operating revenues, operating costs, taxes, financing), calculated financial indicator values, conclusion regarding project viability).

5) **Economic analysis.** A description of analysis results (conversion operation completed, external impact elements, SDR applied, calculated economic indicator values, selected IP implementation alternative).

6) **Sensitivity and risks.** A description of analysis results (critical variables and their breaking points, scenario analysis results, risk measurements for critical variables, risk factor measurements, description of risk acceptability, risk management measures).

7) **Implementation plan.** Describe the project time frame, stages, activities, conditions, continuity and other conclusions.

Once you have prepared the project summary, create a summary table for IP data (based on Annex 2). Attach the table as a separate annex, it should not be included in the 2 pages of the project summary.

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Item No	Risk group	Risk factor Of all the risk factors identified on this list, select and keep only the factors that have an influence on the project	Explanation (detailed description) The risk group is defined by describing its cause and potential impact on the project in consideration of all of the relevant risk factors.	Management tools Indicate measures the applicant will take to manage the indicated risk group and the resources necessary to implement them.
1.	Risk associated with the quality of design (planning)*	The technical design for a building (or any part thereof) commissioned by a public entity is inaccurate. The project goals and intended results do not resolve the problem that the project was intended to address. A project/design objective does not allow the project organisation to fulfil the purpose of the project and achieve the intended results. Project activities are delayed due to the duration of the procurement procedure for design services. The action plan for research and development (R&D) is not accurate. Project activities are delayed due to patenting activity. Design service costs veer off budget. Design service deadlines veer off schedule. Public entity reveals/fails to reveal limitations for the management and use of a plot of land during the procurement process. Previously unknown limitations emerge in the form of certain requirements for the protection of cultural heritage. Known requirements for the protection of cultural heritage are not taken into account. Inaccuracies/flaws in environmental impact assessment or selection documents prepared by the public sector emerge as design services are being provided. Inaccuracies/flaws in environmental impact assessment or selection documents prepared by the private sector emerge as design services are being provided. Documents necessary for the design process, the accessibility of which was supposed to be ensured by the public entity, cannot be accessed by the established deadline. A *force majeure* occurs during the design (planning) process. The public sector changes the requirements for infrastructure during the design stage (including non-essential changes).		

Item No	Risk group	Risk factor Of all the risk factors identified on this list, select and keep only the factors that have an influence on the project	Explanation (detailed description) The risk group is defined by describing its cause and potential impact on the project in consideration of all of the relevant risk factors.	Management tools Indicate measures the applicant will take to manage the indicated risk group and the resources necessary to implement them.
		There are delays in issuing the documents necessary for initiating the design process, even though all of the documents necessary for acquiring them have been submitted and meet requirements (the content of the documents is not in question). Conflicts arise due to the quality or content of the documents necessary for the design process.		
2	Risk associated with the quality of contracting work purchased (carried out);	Damage is done to the environment during contracting work on a real estate object. A private entity does not ensure quality contracting work due to the inaccessibility of information about the state of the object. A private entity does not ensure quality contracting work even though it has all the information about the state of the object at its disposal. Quality contracting work is not ensured due to unfavourable weather conditions. Quality contracting work is not ensured because of the way technological processes are organised. Quality contracting work is not ensured because of a change in legally regulated quality requirements as contracting work is being implemented. Quality contracting work is not ensured due to human resources. Property in an adjacent territory is damaged when carrying out contracting work. Previously unknown limitations to contracting work emerge in the form of certain requirements for the protection of cultural heritage and/or archaeological requirements. The public sector changes quality requirements for contracting work as contracting work is being carried out (including non-essential changes). Quality requirements for contracting work are changed on the initiative or upon the demand of a private entity. Quality contracting work is not ensured due to the unsuitability and/or insufficiency of technological resources.		

Item No	Risk group	Risk factor Of all the risk factors identified on this list, select and keep only the factors that have an influence on the project	Explanation (detailed description) The risk group is defined by describing its cause and potential impact on the project in consideration of all of the relevant risk factors.	Management tools Indicate measures the applicant will take to manage the indicated risk group and the resources necessary to implement them.
		Quality contracting work is not ensured due to the cost or quality of utility services. Quality contracting work is not ensured due to the accessibility or quality of raw materials, materials or mechanisms. Quality contracting work is not ensured due to the actions or inactivity of subcontractors. A *force majeure* occurs as contracting work is carried out. Quality contracting work is not ensured because of the R&D **action plan.**		
3	Risk associated with the quality of services purchased (carried out)	Damage is done to the environment during the provision of services. Quality services are not provided due to inflation, the factual scope of which does not correspond to the inflation rate used in the financial activity model. Quality services are not provided due to the actions or inactivity of subcontractors. Quality services are not provided because of the way technological processes are organised. The public sector changes quality requirements as a service is being provided (including non-essential changes). Quality services are not provided due to the quality and accessibility of human resources. A *force majeure* occurs as the service is provided.		
4	Risk associated with the quality of equipment, devices and products purchased (produced)	Damage is done to the environment when producing equipment, devices or other long-term assets. The quality of equipment, devices or other assets is not ensured due to the actions of subcontractors. The public sector changes quality requirements as equipment, devices or other long-term assets are being provided or produced (including non-essential changes). The quality of equipment, devices or other assets is not ensured due to human resources. A *force majeure* occurs when producing equipment, devices or other long-term assets.		

Item No	Risk group	Risk factor Of all the risk factors identified on this list, select and keep only the factors that have an influence on the project	Explanation (detailed description) The risk group is defined by describing its cause and potential impact on the project in consideration of all of the relevant risk factors.	Management tools Indicate measures the applicant will take to manage the indicated risk group and the resources necessary to implement them.
		Quality requirements for equipment, devices or other long-term assets are changed on the initiative or upon the demand of a private entity.		
5	The risk of insufficient financing	Losses due to different financing costs and operating revenue currencies. Demand for funding changes due to increasing investment costs. The fulfilment of conditions for the principal loan. The interest rate of interbank loans changes for the principal loan. Demand for funding changes due to a change of the value added tax rate. Demand for funding changes due to a change of any tax rate (except for value added tax) or duty. Demand for funding changes due to a change in subsidy size. Demand for funding changes due to a change in the financing amount received through financial instruments. Demand for funding changes due to a violation of the rules for the provision of state support. Demand for funding changes due to the elimination of the possibility to pledge property. Demand for funding changes due to the actions or inactivity of subcontractors.		
6	Risk associated with the suitability of products (services) introduced in the market	The beginning of the provision of services or products is delayed. The public sector changes established quality requirements once the investment process is over. The necessary permits (licences) have not been acquired. The qualification and competence of human resources is unsuitable. Unsuitable technology is used. Unsuitable raw materials or materials are used. New requirements are set once the investment process is over. Infrastructure is completely or partially unsuitable for providing services or products that comply with the provisions of an agreement. The assets used to provide the public service or produce a product is taken over (expropriated, nationalised, etc.) to serve the needs of the public.		

Item No	Risk group	Risk factor Of all the risk factors identified on this list, select and keep only the factors that have an influence on the project	Explanation (detailed description) The risk group is defined by describing its cause and potential impact on the project in consideration of all of the relevant risk factors.	Management tools Indicate measures the applicant will take to manage the indicated risk group and the resources necessary to implement them.
7	Risk associated with market demand for products (services) provided	There is a change in the number of competitors or their activity. There is a change in user opinion about the services or products provided. There is a change in pricing. There is a change in demographic factors. Technology ages.		
8	Risk associated with the residual value of assets at the end of the project time horizon	The maintenance of infrastructure veers off plan. The costs of maintaining infrastructure were not planned accurately. There is an insufficiency of information about the use of an asset during the time horizon. Restrictions are placed upon the management and use of transferred assets due to deals made with third parties.		

When a project does not involve contracting work, planning risk should be understood as risk associated with the quality of project planning.