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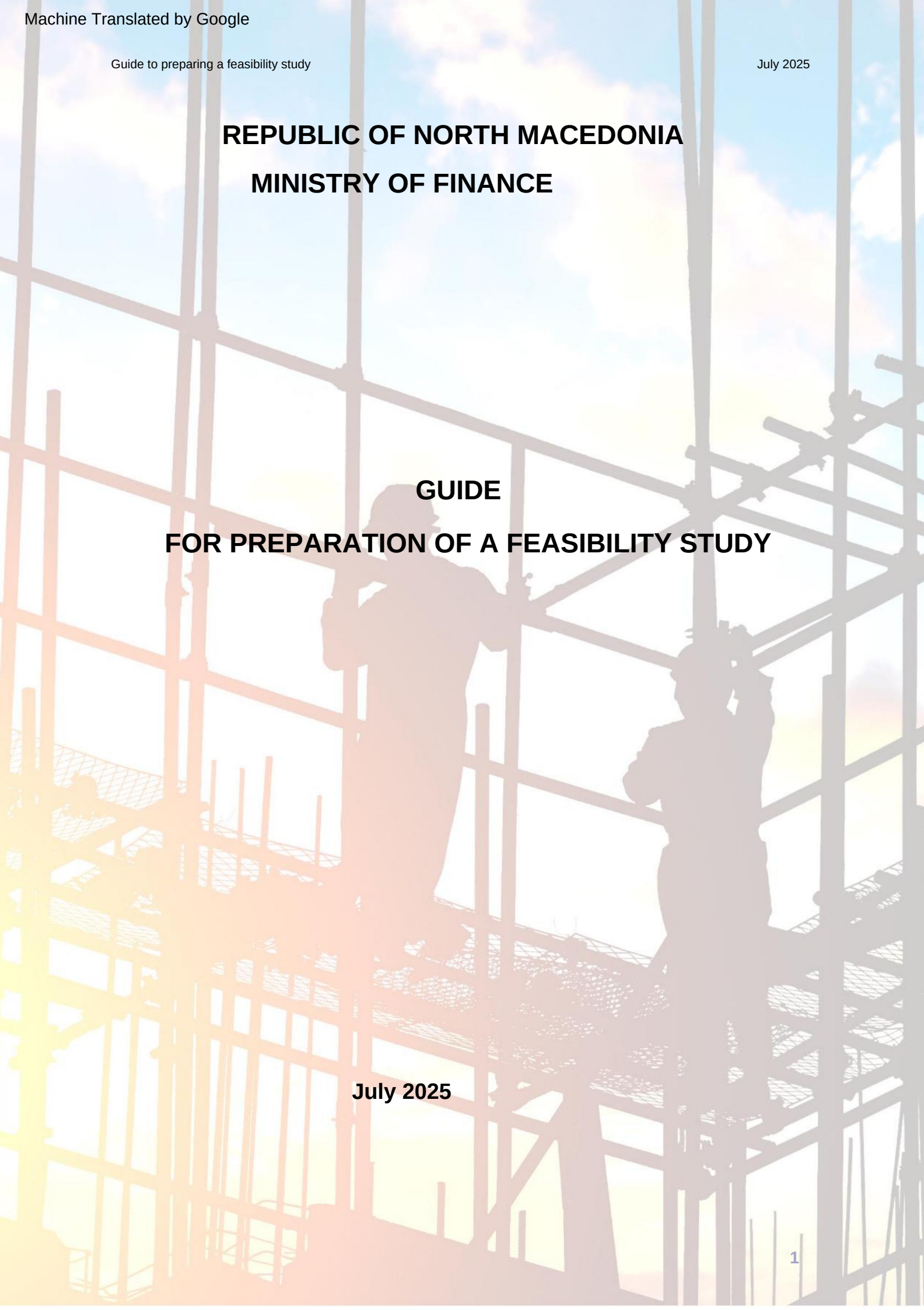
MINISTRY OF FINANCE



GUIDE

FOR PREPARATION OF A FEASIBILITY STUDY

July 2025

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List of abbreviations

VP usual practice (no changes) APT cost-benefit analysis
ATE cost-effectiveness analysis DPT discounted cash
flow European Commission

EC

EIA environmental impact assessment EIB European Investment Bank
EIR economic internal rate of return ENVR
economic net present value ESP economic rate of return
European Union FDS financial discount rate FISP
financial internal rate of return FNSV financial
EU net present value SG

greenhouse gases

ICT information and communication technologies MCA multi-criteria
analysis OR operational expenditure OCP Project
Concept Form ESP Project
Implementation Unit PPP public-private partnership
PPS Public Sector Comparator model IRI research, development
and innovation ODS social discount rate VAT
value added tax GDP value for money analysis WTP
willingness to pay WTP willingness to accept

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Introduction

This Guide for the Preparation of Feasibility Studies provides recommendations to line ministries and other competent public entities on the expectations regarding the content of feasibility studies prepared for the assessment of projects within the framework of
the public investment management process in North Macedonia.

The requirement to prepare a feasibility study stems from the legal framework for public investment management (PIM) of North Macedonia. This framework was established through the adoption of the Public Investment Management Regulation ("PIM Regulation") by the Government of the Republic of North Macedonia. According to the PIM Regulation, a feasibility study is mandatory for all medium and large projects, i.e. those with an estimated total capital cost equal to or greater than 5 million euros (in denar equivalent).

The PIA Regulation also describes the roles and responsibilities of stakeholders involved in each phase of the public investment project life cycle. The terms and designations of stakeholders used in this Guide have the same meaning as in the PIA Regulation and should be understood in that context.

Readers of this Guide may also consult the Handbook on the Public Investment Management Process in the Republic of North Macedonia, a supplementary resource to the Regulation on the Public Investment Management. The Handbook is intended to provide guidance and support to
project proponents and initiators, as well as government and municipal
officials and decision-makers, by clarifying the principles, procedures and roles of stakeholders involved in the preparation and evaluation of public investment projects in North Macedonia. It provides descriptive explanations and

elaborates the key roles of stakeholders in the public management process
investments.

The line ministry or competent public entity responsible for
The project proponent is fully responsible for carrying out the appraisal of projects in North Macedonia. The entity responsible for the project organizes the appraisal, together with the activities related to the conceptual design and other accompanying studies, for example, additional studies for assessing the impact on the environment and/or social aspects. These activities can be carried out by the entity itself or by engaging private consultants for them.

companies, individuals or academic institutions.

Much of the work undertaken to establish the context for the project should be carried out when preparing the Project Concept Note required for the pre-selection decision. As part of the project appraisal, the information and analysis provided in the CMP should be reviewed, updated and

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If the project context deteriorates significantly after the pre-selection, the project assessment should not be continued, and the project idea should either be abandoned or a revised CMP required for the pre-selection decision should be submitted.

This Guide provides the content and sets out the minimum requirements for a feasibility study in North Macedonia within the framework of the public investment management process. It is also recommended to use it for the purposes of preparing a pre-feasibility study, which can be a step preceding the preparation of a feasibility study, especially when it comes to large investment projects.
The main difference between a pre-feasibility study and a feasibility study lies in
that the pre-feasibility study is mainly based on secondary data sources, rather than primary sources. Also, the number of options considered in the early phase is larger, and only those options that are worth further consideration
They move on to the next phase, i.e. the preparation of a full feasibility study.
Where appropriate, the difference between the expectations for the pre-feasibility study and the feasibility study is shown in the requirements and in the expected content of the specific chapters.

This document is largely based on the 2014 Guide to Cost – Benefit Analysis of Investment Projects, which expands and updates the previous 2008 edition and contains additional sector-specific guidance.

Other documents used as key sources are the following:

- Economic Appraisal Vademecum 2021-2027: General Principles and Sector Applications (Economic Assessment Handbook 2021-2027: General Principles and Sectoral Applications), European Commission, 2021, which
  update and review in more detail certain aspects of the project assessment covered in the 2014 Guide;

- The Economic Appraisal of Investment Projects at the EIB - 2 nd Edition (Manual for Economic Assessment of EIB Investment Projects – Second Edition), European Investment Bank, 2023;

- Public Investment Management Reference Guide
  investments), World Bank, 2020;

- Technical guidance on the climate proofing of infrastructure in the period 2021-2027, European Commission, 2021;

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- Reference Guide for Climate-Smart Public Investment, World Bank, 2022.

Given that this guide provides general guidance on the expected content of a (pre)feasibility study, project initiators/proponents are advised to use the above documents whenever necessary.

more detailed directions.

The arrangement of components in a feasibility study does not impose a strict order in the work process. Feedback and iteration will occur between the different elements, with the final feasibility study being the end result of these interconnected elements, which do not necessarily follow a strict linear order.

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1. Chapter 1. Project Summary and Feasibility Conclusions

This Chapter of the feasibility study provides a brief presentation of the project. It is expected to contain at least the following elements:

- basic administrative information regarding the project;
- overview of the project components and their costs;
- indicative project timeline;
- a summary of the goals and objectives in relation to the identified needs;
- results of the financial and economic analysis;
- an explanation of the project's sustainability;
- evaluation of the overall feasibility of the project in terms of institutional capacity, as well as legal, technical, financial and economic aspects; and
- a brief summary of key findings and conclusions.

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2. Chapter 2. Analysis of the existing context

2.1. Social and economic context of the project

The most important step in project appraisal is to understand the social, financial and institutional context within which the project is to be implemented. A proper assessment of the macroeconomic situation and the social picture related to the project are crucial for an accurate assessment of the potential benefits and costs arising from the implementation of the project.

Depending on the project, the context of this analysis may be local, regional, national or transnational and should be identified on a case-by-case basis. A detailed study of the social and economic environment also helps in conducting the demand analysis.

The objective of this phase of the project assessment is to provide comprehensive data regarding the area that will be affected by the project, covering at least the following:
aspects:

- environmentally friendly,
- demographic,
- financial,
- economic, and
- social.

This data should align directly with the scope of the proposed project.

2.2. Alignment of the project with international obligations, government policies and sector strategies

Public investment projects should be aligned with the priorities of the government (or municipality) in order to contribute to the achievement of its overall objectives. Such alignment should be supported by demonstrating consistency between the project objectives and the international commitments, strategies and policies of the government (municipality). At the same time, the alignment of public investment projects with sector strategies, if such strategies exist, should be demonstrated.

It is important to state the specific objectives of the relevant strategy to which the project will contribute. It is also recommended, if possible, to express this contribution quantitatively, e.g. if the transport strategy for the next 5 years foresees a target of building 100 km of motorways and the project involves the construction of 50 km.

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long highway, it can be said that the contribution of the project to the implementation of
strategy is equal to 50%.

2.3. Roles and responsibilities in the sector

In this section, project proponents should review the existing conditions in the relevant sector and include all details regarding the institutional environment in which the infrastructure that will be created as a result of the project implementation will be managed. Considering that investments are
implemented within given institutional contexts, it is necessary to understand the roles and responsibilities in the relevant sector so that the project can be successfully integrated into existing systems.

The main goal of this section is to answer the following questions:

- What is the current state of the relevant sector (including
  recent trends and a comprehensive overview of the sector)?
- How is the system structured and what is the current organizational set-up within which the infrastructure will be managed?

2.4. Analysis of institutional capacity

Institutional capacity encompasses all organizational structures necessary for project implementation and infrastructure management, including:
establishment of a Project Implementation Unit (PIU), if necessary. Legal and regulatory obligations should also be presented.
undertaken contracts.

This section should outline potential institutional approaches and recommend the most effective one, supporting the decision made for it. It should explain who will implement the project, who will own and manage the infrastructure once it is completed, and why the chosen approach is considered the most effective. Chapter 12.1 of the feasibility study should address in detail the capacity of the relevant entities.

If the owner of the planned infrastructure and the entity that will manage it in the future are different, then both entities need to be listed and described.
This includes a description of the type of entity that will manage the infrastructure, the criteria according to which the entity was selected, as well as the contractual obligations between the partners (the owner and the entity that will manage the infrastructure), including financing mechanisms, for example, charging a tariff/service fee and potential state subsidies.

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3. Chapter 3. Project needs and objectives

3.1. Analysis of project needs

It is necessary to provide an explanation of the circumstances that make it necessary to implement the project, commonly known as the project justification. The (pre)feasibility study should clearly explain the reasons for the necessity of the project by considering the problems that need to be solved or the opportunities that need to be provided by the project.

This Chapter of the feasibility study should describe in detail the problems (including gaps, deficiencies and errors) to be addressed by the project, using quantitative and qualitative data (where possible), in order to demonstrate why the investment is needed. It is crucial to provide a brief summary of the key infrastructure gaps and needs that will be addressed by the project.

These identified problems should be considered in relation to the individuals or groups that will benefit from the project and relevant figures should be provided for them. The beneficiaries (target groups) and their number are always determined depending on the specifics of the specific project.

Examples of direct beneficiaries of public investment projects in different sectors

In many health sector projects, direct beneficiaries often include patients who gain access to more modern medical facilities and improved services, and staff who gain access to better working conditions. Similarly, in education sector projects, students directly benefit from improved educational resources and facilities, and teachers gain access to better working conditions. Agriculture sector projects can directly support farmers by offering them training and resources for sustainable agricultural practices, while environmental conservation projects directly protect ecosystems and wildlife. Technology access projects empower communities by providing them with digital technologies and Internet access, contributing to a more connected and inclusive society, while renewable energy projects have a direct impact on communities by providing them with affordable, sustainable energy sources.

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3.2. Main objectives of the project

Defining project objectives is a fundamental step in effectively identifying and analyzing a project. Direct and indirect objectives should be identified through a thorough analysis of the social and economic environment, focusing on phenomena that are relevant to the scope of the project's impact. This activity will be largely carried out during the identification and pre-selection phase, but can still be refined and finalized during the project appraisal phase.

The project objectives must be realistic (i.e. achievable during the project period).
duration of the project, together with the proposed budget and resources), clear (without ambiguity), quantified as much as possible, and linked to the proposed investment. They should also directly address the problem(s) that the project is targeting. The link between the identified problems (gaps/deficiencies/errors), the project objectives and the proposed solution(s) must be clear.

3.3. Indicators for outputs and results

Measurable project objectives should be expressed in output and result indicators.1

Output indicators describe the delivered products, for example, the number of kilometers of newly built or upgraded roads/railways/road lanes in
urban areas, the number of kilometers of newly installed or repaired water supply/sewerage pipes, the number of new water supply connections, the capacity of newly built/upgraded retention tanks
(m3), the number of renovated schools, etc. Achieving the project outputs does not guarantee that the project will be successful, but without achieving the outputs, the chances of
success is small.

Result indicators measure the achievement of sustainable benefits for
the beneficiaries of the project, for example, users of new or upgraded roads, students enrolled in college, reduced susceptibility of children to certain diseases, the total population provided with improved sanitation services.

Indicators related to gender equality should also be included in this section,
if possible.

[1] For additional guidance and explanations, please refer to the *Public Investment Reference Guide. Public Investment Management),* World Bank, 2020, pp. 151-152.

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3.4. Impact of the project

In this section, project initiators are expected to explain how achieving the benefits reflected in the result indicators will contribute to
meeting general objectives, such as increased private sector revenues,
better living standards, improving the attractiveness of tourism or protecting
of natural resources, etc.

Such an impact will not usually generate financial income for the project, but will have a positive effect on society as a whole. The economic analysis should also include significant impacts, as well as impacts that could generate profits (see Chapter 9 of this Guide).

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4. Chapter 4. Demand Analysis

Demand analysis is a key element in the project assessment, given that its purpose is to identify the demand for the services to be provided as a result of the project implementation. Identifying demand is necessary in order to adequately determine the capacity of the planned public facility. By accurately quantifying demand, it is possible to: define the appropriate scope of the infrastructure, taking into account

existing and future beneficiaries; to carry out an accurate cost estimate; to determine the benefits; and to draw a sound conclusion regarding the economic feasibility of the project. Hence, the search analysis should be carried out before the options analysis, financial and economic analysis, considering that it provides the basic inputs necessary for the following steps of the evaluation.

[2] The scale of the project and its nature determine how detailed the analysis should be. For major projects (with high expected value and scope of beneficiaries, complexity, high environmental impact or strategic importance, etc.) or exceptionally innovative projects (introducing or using new and advanced technology or sustainable practices), a comprehensive analysis is expected. Such analysis requires the collection of comprehensive data through surveys, econometric analyses and, where possible, the use of modelling techniques. For projects that are less complex or of lower value, it is acceptable to use an approach based on the analysis of trend information.3 Regardless of the scale of the investment, it is necessary not only to quantify current demand, but also to include expected changes in demand throughout the life of the project (in the implementation phase and in the management phase).

Demand analysis is carried out in three main steps:

- assessment of the current demand for the services to be provided by the project in the area of influence;
- identifying the key factors that determine the change in demand for services in the future;

[2] *Guide to Cost-Benefit Analysis of Investment Projects: Economic Appraisal Tool for Cohesion Policy 2014-2020,* European Commission, 2014.

[3] *Public Investment Management Reference Guide,* Jay-Hyung Kim, Jonas Arp Fallov, Simon Groom, World Bank, 2020 year.

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- estimation of future demand.

4.1. Current demand

The first step in the demand analysis is to determine the current demand for the services that will be provided by the project. Data from service providers,
Statistical offices, state administration bodies or local authorities are the basis for assessing current demand. Project initiators should make efforts and provide the latest available data.

Depending on the sector, demand is driven by a range of factors with varying
degree of importance.

The table below presents a list of factors that influence demand in given sectors. However, the list is not exhaustive and the factors that determine demand should be identified for each project separately, taking into account its specific nature.

Table 1: Factors influencing demand in selected sectors

Sector	Factors
Transportation	Demographic trends - changes in population size and age structure - the number of working-age people and the inactive population Socio-economic trends - economic growth at national and regional level - employment structure in the relevant region Structure and expected development of the industrial and logistics sectors Limitations in the capacity of alternative structures and their prospects for development Spatial changes Envisaged revision of traffic management strategies Technological changes that affect the cost structure of the project or of alternative options
Water supply and sewage	Socio-economic trends - demographic projections - economic growth (higher standard of living, growth in production, development of tourism) - trends in agricultural production - trends in industrial production Climatic aspects - seasonal work - climate change projections

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Sector	Factors
	Willingness to pay and tariff system
Management waste	Socio-economic trends - economic growth in relevant sectors - demographic projections Social changes and consumer habits - changes in consumption volume related to living standards - social and institutional involvement in reuse practices and recycling Legal framework - planned changes in regulations related to waste management Innovations, new business models, development of the circular economy
Energy	Socio-economic trends - demographic projections - economic expansion and its energy intensity - changes in living standards Climatic conditions (demand arising from heating and cooling needs) Energy efficiency - transmission/transport infrastructure - end users (for example, improving the thermal insulation of a building) Tariff system
IT and telecommunications	Socio-economic trends - economic growth at national and regional level - demographic projections - employment rates and labor market structure Digital education and skills - level of education - level of ICT training and skills Geographic and demographic characteristics - degree of urbanization (unmet demand in rural areas) Availability/accessibility and users' willingness to pay Demand aggregation - demand from public authorities and institutions (e.g. hospitals, libraries, schools) and local communities Prospects for future demand - structural development
Research, development and innovations	Socio-economic trends (general) - economic growth at national and regional level - employment structure - education Geographic and demographic characteristics - scope and characteristics of the industry in the area where it will be located

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Sector	Factors
	the infrastructure Target group-specific drivers: BUSINESS ENTITIES - expansion of the industrial base within the framework of IRI projects during the last years - average annual profitability of the industrial base within the IRI the projects - access to venture capital funds (which encourage the establishment of startup companies) - level of public investment in areas related to IRI projects - number of business entities potentially interested in using services offered by IRI projects SCIENTISTS, STUDENTS, YOUNG PROFESSIONALS - number of scientists working in the field of IRI projects and in the specific geographical area - existing facilities and competition in the related field of IRI - technical characteristics and scientific potential of the IRI infrastructure - relevance of IRI skills acquired in research projects for labor market - capacity of the project to attract financial resources and beneficiaries - existing and previous achievements of researchers TARGET POPULATION/GENERAL PUBLIC - number of individuals exposed to environmental and health risks that are effectively overcome by IRI projects - existence of knowledge transfer agreements with other IRI infrastructures - the general public's perception of the infrastructure - a fee charged for guided excursions or other activities related to communication with the public

Source: Guide to Cost-Benefit Analysis of Investment Projects: Economic Appraisal Tool for Cohesion Policy 2014-2020 (Guide to cost-benefit analysis of investment projects: Economic assessment tool for Cohesion Policy 2014-2020), Directorate-General for Regional and Urban Policy, European Commission, 2014

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4.2. Future demand

The next step in the demand analysis involves preparing demand projections. Future demand must be forecast for the entire duration of the project, and be consistent with the reference period to which the analysis relates (see Chapters 8 and 9 of this Guide). In general, future demand is formed by existing users, users coming from other service providers, and

services and new users, all as a result of the implementation of the project (induced demand).

All underlying assumptions for estimating future demand must be disclosed. Projections of future demand should be based on reliable models, taking into account

taking into account macroeconomic and socio-economic projections, alternative sources

of supply and the price and income elasticity of demand, as well as all other factors specific to the given project.

Future demand should be assessed for both scenarios, with and without the project implementation, in order to prepare projections for the project's demand. For even greater precision, it is incremental basis. [4] recommended to prepare

projections individually for different user groups (for example, business sector, industry, institutions or housing).

[4] Guide to Cost-Benefit Analysis of Investment Projects: Economic Appraisal Tool for Cohesion Policy 2014-2020, Directorate-General for Regional and Urban Policy, European Commission, 2014

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5. Chapter 5. Options Analysis

The analysis of options is used for the purpose of comparing and evaluating relevant investment and non-investment solutions for the needs and objectives identified in Chapter 4. The main objective of the analysis is to determine which of the possible options is the best, i.e. the most beneficial in terms of the relationship between results and means, and should be selected as the variant for implementing the

the project.

The list of identified options may change as more data becomes available and more information is gathered about the project needs, its environment and possible solutions during the project preparation phase. During the preparation phase of the OCP, certain options may have been developed or discarded by

certain reasons. It is advisable to list all options considered in the feasibility study and to provide an explanation for the rejection/neglect of these ideas, as this shows that the project initiator has considered numerous alternative solutions and has not omitted any important solution.

The options considered should be compared to the “business as usual (BA) scenario (no change)”, i.e. the scenario in which the investment is not implemented. The BA variant should not be considered an option due to the fact that it does not solve the identified problem(s).

Finally, all feasible solutions should be compared. If, after the pre-selection phase, there are many possible options to be considered during the project appraisal, then it is recommended to prepare a pre-feasibility study in order to reduce the number of solutions to a reasonable level in the final phase.

5.1. Project variants

All project variants that have been considered should be listed in this section. In
Depending on the characteristics of a particular project, the following categories of options may be
to be taken into account when conducting the options analysis:

- Location options

The purpose of this analysis is to determine the best possible location for the project. In most cases, the location should be determined at an earlier stage (for example, during strategic planning), and the feasibility study should focus on explaining the reasons for such a choice. When comparing different location options

options, it is recommended to take into account the risks caused by climate change
changes and other relevant issues, such as land ownership, access

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to the location and/or spatial planning, which will be discussed in more detail in Chapter 6 of the feasibility study.

- Strategic options

This category focuses on analyzing different strategic approaches on how to solve the identified problem(s), for example, considering
different routes for the planned railway or building several small, local
clinics instead of one large medical facility.

- Technological options

The use of different technologies or technological approaches can contribute to a significant increase or decrease in the overall investment and/or operating costs. Also, when choosing technological solutions, the capacity of the entity that will manage the infrastructure to ensure adequate maintenance of the planned infrastructure should be taken into account.

- Improving existing measures/infrastructure options

The outcome of a project does not always have to involve the creation of a completely new public asset/infrastructure. In many cases, improving existing measures or initiatives is a good option that requires much less capital investment and can achieve similar goals.

- Various options regarding timeframe/phases/scope

It is recommended that changes in the timeframe, phases and scope of capital investment projects are always taken into account. In certain cases, it is more cost-effective to make a smaller investment but provide the option to expand the infrastructure in the future, for example, when demand increases.

- Institutional options

Project options may include measures other than expenditures directly allocated to the procurement of new fixed assets and the provision of public services. Other investment arrangements, such as public-private partnerships, should also be considered (see Chapter 10 of this Guide).

The list of categories covered by the options analysis is by no means closed, hence the scope of the assessment may be expanded depending on the nature of the
the specific project. Also, the recommendations do not impose a sequence in which these activities should be carried out. The options analysis is an iterative process and should not be viewed as a separate and isolated phase of the preparation of the feasibility study.

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However, it is highly recommended to reduce the number of options as early as possible, but this should not prevent the reintroduction of options that were discarded in the early stages of project development, especially if new data becomes available. The chapter on options analysis should fully cover the process of determining the preferred investment option.

5.2. Methods for evaluating project variants

In this section, the project initiators should describe and explain the project(s)
the method(s) used to compare project options. In order to evaluate each identified project option and determine which is the most beneficial, a number of quantitative and qualitative methods can be used. The *Economic Appraisal Vademecum* presents and describes the three most commonly used methods for comparing options:

- cost-benefit analysis (CBA) - quantitative,
- cost-effectiveness analysis (CEA) - quantitative,
- multicriteria analysis (MCA) - qualitative.

ATP is also the most complex and at the same time the method for evaluating project options. which is very demanding, as it requires a precise and detailed assessment of the benefits and costs of each individual option. The ATE method is used to compare the costs over the entire duration of the project with its estimated outputs, as well as to determine which option is the most cost-effective. The MCA method is the simplest to use, and in its application a system of criteria and weights is used in order to evaluate each individual option by assigning points to it.

It is always recommended (if possible) to use ATP to evaluate alternatives for major projects, due to the fact that it is the most commonly used technique for the assessment of public investment projects and, more importantly, it is a method prescribed by the EU Funds regulations for major projects.
More details on how ATP is implemented are provided in Chapters 8 to 10.

5.2.1. Cost-effectiveness analysis

ATE is a method used to compare alternative project options in terms of their efficiency and life-cycle costs in achieving a specific objective. Its main goal is to determine which investment option offers either the best effect at the lowest cost or the best effect for a given cost (for example, minimizing costs or maximizing effect) - that is, ATE helps project initiators solve the problem in an optimal way.

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resource use and determine the option that uses them most efficiently
the allocated funds.

This methodology can be used as an alternative to ATP for projects whose benefits are very difficult (if not impossible) to monetize, while, on the other hand,
costs can be predicted with greater certainty, hence it represents
a practical tool for comparing projects in the event that:

- the project generates only one output that is homogeneous and easily measurable;
- one of the main goals is to achieve output at the lowest cost or to achieve the best output within the established budget;
- the costs of the project can be estimated and calculated in detail, and there are no significant or relevant hidden costs;
- the project has no significant external costs/benefits (i.e. costs or benefits of the undertaken activity for an unrelated third party).

More information about ATE and its methodology can be found in *Economic Appraisal Vademecum (Economic Appraisal Handbook)* [5], as in EC Guidelines (EC Guide) [6].

5.2.2. Multicriteria analysis

MCA is used as an evaluation technique, the purpose of which is to determine preferences among a number of different options for achieving a specific set of project objectives. It helps project initiators identify the best

investment alternative based on a specific set of criteria, as well as through
assessing the extent to which each of the proposed variants meets the
the goals of a particular project.

There are a number of different ways to design an MCA and it can be prepared in different ways, for example, depending on the specifics of a particular investment or the available data. It is recommended that the analysis be prepared in agreement with
the following directions:

- the selected criteria should be clearly defined;

[5] *Economic Appraisal Vademecum 2021-2027, Chapter* 3. Other economic appraisal tools, EC, 2021

[6] Guide *to Cost- Benefit Analysis of Investment Projects,* Annex IX Other appraisal tools, EC, 2014

year

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- each project objective should be expressed in a measurable variable;
- Each objective should be assigned a weight that reflects its importance based on government priorities and a rationale should be provided.
  the same;
- an impact analysis should be conducted for each of the selected criteria (i.e. the effects it provides should be described quantitatively or qualitatively), along with an explanation of the specific number of points awarded;
- the results of the MCA should be presented in a table with all project variants and the weighted average scores assigned to them, thus allowing them to be ranked sequentially.

Based on the above guidelines, six steps in the implementation of MCA can be identified, namely:

- project initiators should determine the objectives for implementing the MCA;
- project initiators should identify relevant project
  options to be compared;
- project initiators should identify the objectives and
  the limitations of each selected option;
- project initiators should assign specific weights to each of the objectives depending on their importance and should select criteria relevant to the type and specificity of a particular project;
- project initiators should provide a description of the expected results for each selected option in relation to each of the criteria and assign it a score that should reflect the ability to deliver the specific benefits;
- and finally, the project initiators should combine the weight and scores of each option to obtain a total weighted score, thus allowing the project options to be ranked in order;
- then, as an additional step, an analysis can be carried out on
  sensitivity to test the robustness of results to changes in weights and scores.

It is recommended that MCA be used as a complementary tool to cost-benefit analysis and cost-effectiveness analysis. MCA can be particularly useful in the early stages of project development, when comparing

strategic options.

More information on implementing the MCA and its methodology can be found in
The Economic Appraisal of Investment Projects at the EIB (Manual for economic

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(evaluation of EIB investment projects) [7], as well as in the Economic Appraisal Vademecum (Economic Assessment Manual) [8].

5.3. Presentation of results

In this part of the feasibility study, it is recommended that the summary of methods used clearly states the rationale and criteria applied at each stage of the analysis, as well as the rationale for the selection of criteria in relation to the specificity of the project. The options analysis should be carried out for at least two investment alternatives (in addition to the business-as-usual scenario) and should include a description of the assessment of the proposed solutions in accordance with the selected measures, including the criteria for the impact of climate change.

The result of the options analysis, i.e. the preferred variant, should be clearly explained, described, and the reason for its choice should be fully justified.
The chosen procurement option (e.g. standard public procurement procedure or PPP) must be stated. The description should also include a section that takes into account climate change mitigation and adaptation issues.

changes, provided that the climate change risk assessment identifies a need for the same.

[7] *The Economic Appraisal of Investment Projects at the EIB - 2 and Edition (EIB Investment Project Economic Appraisal Manual* – Second Edition), European Investment Bank, 2023.

[8] *Economic Appraisal Vademecum 2021-2027,* Chapter 3.2. Multi-criteria analysis *(Economic Appraisal Handbook) assessment 2021 – 2027,* Chapter 3.2. Multi-criteria analysis), EC, 2021.

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6. Chapter 6. Technical Studies

6.1. Field research

The (pre)feasibility study should pay particular attention to site-related issues. In particular, extensive field investigations are required for the preparation of a full feasibility study, as without such investigations it will be difficult to prove technical feasibility or to provide an accurate cost estimate. For example, conducting geotechnical investigations is often crucial for gathering information on the physical properties of the soil, which in turn can significantly affect construction cost projections. Also,

Issues related to access rights to construction sites often lead to project delays and need to be considered in detail. This aspect should be included in the technical assessment, together with a plan to resolve any issues or a statement confirming that there are no access issues.

The project initiators should clearly present the field research conducted and review the results obtained.

Providing basic services, such as electricity, gas, water, sewage and communications facilities at the site, as well as the construction of new service roads, are also challenges common to many projects. The technical assessment should examine the availability and methods of providing all necessary services at the project site.

6.2. Overview of spatial planning issues

The description, supported by maps and other relevant documents, should confirm that the project complies with the requirements contained in all relevant spatial planning regulations and plans. This section should list the relevant spatial planning documents, together with the justification confirming such compliance.

compliance.

6.3. Land acquisition

In this section, the project initiators must provide evidence confirming that the land required for the purposes of implementing the project is either owned by the entity responsible for implementing the project or it has access to the land, with full rights to use it. On the other hand, if the acquisition is to be carried out through purchase or lease, it should be detailed

describe the conditions for the redemption process.

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In cases where expropriation is required, it is crucial that relevant issues are resolved at the earliest stage in order for the project to be implemented in a timely manner.
This includes consideration of legal, financial and administrative issues, accompanied by consultation and negotiations with stakeholders. This section should outline the analysis and consultations already carried out, together with a clearly defined plan for the next steps. It is important to note that costs related to compensation and relocation costs should be clearly stated in the financial analysis.

6.4. Preliminary technical design

This section should describe and explain the needs for the selected technical project.
The description must include the main components of the construction works, the technology adopted, the technical specifications and standards of the project. More detailed information should be provided in the attached technical documentation.

If the conceptual solution includes measures for resilience to climate change and disasters, such measures should also be described here.

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7. Chapter 7. Project financial costs and timeline project implementation

7.1. Estimation of the initial investment costs of the project

The purpose of this section is to detail the initial investment costs.
(capital expenditures (CAPEX)) required for the successful implementation of the project. The scope of the project may include various categories of costs, including capital costs for all fixed assets and intangible assets. Examples of

typical capital costs:

- development costs, including personnel costs and fees for consulting and other professional services;
- purchase of land and buildings;
- fees for licenses and permits related to the project;
- costs associated with site/ground preparation;
- construction works related to infrastructure (access road to location/terrain, utility connections);
- construction,
- costs associated with mitigating the impact on social aspects and the environment;
- procurement of equipment, vehicles, hardware and software for the needs of the project,
- costs associated with installation, maintenance and commissioning;
- costs associated with supervision.

Costs should be estimated for all categories of the project budget. For each cost category, the basis for their calculation should be explained in detail.
In the preparation phase of the feasibility study, the cost estimate
It is usually done by engineers/technical experts based on the conceptual design for the infrastructure in question, resulting in a conceptual bill of quantities with calculation. Unit prices for the envisaged quantities should be determined based on a market analysis.

7.2. Timeline for project implementation

The project implementation schedule should reflect the scope of the project and be consistent with the financial costs presented above. It can be presented in the form of a Gantt chart that lists all the

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relevant components of the project. The schedule should be sufficiently detailed to clearly show the sequence and timeframe for the execution of the construction works.

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8. Chapter 8. Financial Analysis

Although public investments are not usually expected to be financially profitable, it is still necessary to conduct a financial analysis of the project.
The purpose of the financial analysis of public investments is to assess the financial profitability of the project for its owner and key stakeholders, to confirm the financial sustainability of the project and to determine

the available funds for the project, as well as to indicate the cash flows that serve as input for calculating the socio-economic costs and benefits in
economic analysis.

When conducting the financial analysis, project initiators should:
do the following:

- determine the financial profitability of the project;
- confirm that a revenue-generating project is a financially sustainable project;
- to confirm that a project that does not generate revenue or is not financially sustainable is justified, and to assess its impact on the national budget in the short and long term.

The financial profitability of a project means that there is a positive difference between the present values of the project's cash inflows and outflows (including capital and operating costs).

The financial sustainability of a project implies that it will generate sufficient funds to meet its obligations during its duration or that the competent public entity will provide sufficient funds.

Determining the availability of funds for the project is a process in which project initiators should examine (1) whether the competent public entity has sufficient funds to implement the project and (2) how the cash flows associated with or generated by the investment will affect the budget of the entity that will manage the infrastructure.

The scope of the financial assessment presented in this Feasibility Study Guide may be extended if necessary, taking into account the nature and/or legal and financial structure of the specific project. For further guidance on the methodology for conducting financial analyses, project promoters should refer to Section 2.7 of the European Commission's Guide.

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8.1. Methods and assumptions

This section should list, describe and explain in detail the methods used and all assumptions on which the financial analysis of the investment project is based. They should include assumptions for macroeconomic scenarios, as well as methods in accordance with the following guidelines.

It is particularly recommended that the financial analysis be conducted at real prices, i.e. excluding the effect of inflation. However, macroeconomic developments are certainly important and should be taken into account in certain situations, such as rapid increases in electricity prices that exceed the inflation rate. A comprehensive explanation of all assumptions should be provided.

Financial analysis should be conducted by comparing the costs of a specific project (both investment and operating costs) with its estimated
revenues over its duration, i.e. the time period of the expected management of the infrastructure, using the discounted cash flow method (DCF), as well as by adopting the following rules:

- the analysis should only consider cash inflows and outflows (for example, it ignores depreciation, price and unforeseen technical expenses or any other accounting items that do not correspond to real flows);
- an appropriate financial discount rate (FDR), which is in accordance with existing regulations, must be adopted and used to calculate the current
  value of future cash flows;
- a basis for comparison of the investment variant is needed (i.e. variant 0 – “business as usual (no change)” or the variant “no project”);
- the analysis should be conducted without VAT, if the investor/initiator of the project is entitled to a VAT refund;
- the reference period of the analysis (i.e. the number of years for which the cash flow projection is made) should be determined by the initiators of the
  the project based on the economic life of the project.[9] In *the Guide to*

[9] In *the Economic Appraisal Vademecum 2021-2027 (Economic Appraisal Manual 2021 – 2027)* the economic duration of a project is defined as “the expected time during which the promoter can use the project (i.e. the project can provide goods/services to the promoter)”. *Economic Appraisal Vademecum 2021-2027: General Principles and Sector Applications*
(Economic Assessment Handbook 2021-2027: General principles and application across sectors), European Commission, 2021, p. 20.

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The EC *Guide to Cost-Benefit Analysis of Investment Projects* provides indicative reference periods by sector, shown in the table below.

Table 2: Reference periods of project analysis by sector

Sector	Number of years
Railways	30
Roads	25-30
Ports and airports	25
City transport	25-30
Water supply and sewage	30
Waste management	25-30
Energy	15-25
Broadband Internet	15-20
Business infrastructure	10-15
Other sectors	10-15

Source: Guide to Cost-Benefit Analysis of Investment Projects: Economic Appraisal Tool for Cohesion Policy 2014-2020, *European Commission,* 2014, p. 42.

8.2. Estimation of capital expenditures, operating expenditures and revenues10

Although the initial investment costs (CAPEX) of the project should be discussed in detail in Chapter 7 of the feasibility study, this section should present
the estimated total capital costs of the project, over the entire life of the project, including replacement costs, as well as the estimated annual operating costs and revenues (if applicable), for each year of the relevant reference period. The project initiators should also

provide the basis for such assessments.

The total capital costs of a project consist of (1) initial investment costs, which include capital costs for all fixed assets and intangible assets, and (2) replacement costs, which refer to costs that

[10] This section should present the financial cash flows of the project. Economic cash flows may differ, requiring their adjustment to the financial flows as outlined in Chapter 9 of this Guide.

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arise when replacing machinery and/or equipment during its lifetime
the project.

The initial investment costs (or capital expenditures) represent the total value of the project and should be in accordance with the project budget presented in Chapter 7 of the feasibility study, while the bases for their calculation do not need to be repeated in this section.

Replacement costs should be included in the expenditures incurred during the infrastructure management phase.

Operating expenses (O&C) should include all costs related to the management and maintenance of the new or improved service resulting from the project, incurred over the years within the reference period. Typical operating expenses include:

- labor-related costs (salaries and benefits, social contributions);
- utility costs;
- fuel;
- materials;
- costs related to infrastructure security;
- maintenance costs (maintenance or minor repairs to the public asset);
- office services (e.g. online services, data processing);
- costs associated with leasing and renting;
- maintaining hygiene.

Financing costs must not be included in operating expenses.

Project revenues include cash inflows for goods and/or services provided as a result of the project, for example, fees paid directly by users for the use of infrastructure (motorway tolls), leasing of land/buildings (leasing office space or classrooms).

The annual amounts of these revenues should be determined in the projections through the prices and estimated quantities of goods and/or services provided during the years of the infrastructure management phase. The basis for these projections and the final results should be presented in accordance with the demand analysis.

The operating income used in the calculations of financial profitability must not include transfers or subsidies (for example, transfers from the state or regional budget or from the national health insurance).

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insurance) and must not include other financial income (for example, interest on bank deposits), as these cannot be directly attributed to the management of the infrastructure. However, they should be included when

confirming financial sustainability.

Finally, the residual value of fixed assets should be included as income in the last year of the reference period. It reflects the value of public assets whose economic life has not yet been exhausted and should be calculated using depreciation rates for each category of capital expenditure that

is part of the investment. Details on the calculation of the residual value (and the depreciation rates to be applied) are contained in the relevant laws/regulations. Additional guidance can also be found in *the Guide to Cost-Benefit Analysis of Investment Projects.*

8.3. Project financing

This section of the feasibility study should provide a detailed description of all sources of financing for the project's investment costs, including the origin and type of source, as well as the financing plan (if appropriate).

The main sources of funding are:

- own funds;
- public funds (for example, co-financing in the form of grants or capital subsidies at central, regional or local government level);
- private funds (for example, loans or equity);
- other sources.

Depending on the chosen source of financing, additional information may be required (for example, repayment terms for a bank loan).

8.4. Available funds for the project

A project budget analysis must be conducted for all projects. Its purpose is to determine the net impact that the project will have on the budget of the entity responsible for implementing the project and/or the entity that will manage the infrastructure.
during its duration (i.e. during the implementation and management phases), as well as to determine whether the investment is justified from a fiscal perspective.
point of view.

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Project initiators should secure the source, demonstrate a strong commitment, and identify all funds allocated to cover both the investment costs and the
and the project's operating costs.

8.5. Financial indicators

The financial analysis, as well as the economic analysis, should be conducted using the Differential Cash Flow method, which compares the cash flows for each project variant with those presented in the VP scenario.

The results of the financial cash flow analysis should be presented in the form of two financial indicators:

- financial net present value (FNPV) – is defined as the amount obtained when the discounted expected investment costs and operating costs of the project are subtracted from the discounted value of expected revenues and residual value. When this indicator has a positive value, then the project is profitable;

- financial internal rate of return (FISR) – is defined as the discount rate that yields a FNSV equal to zero. This indicator is used to
  It compares investment costs and operating costs with net revenues, and measures the extent to which the investment can be recovered from the project's cash flows. If its value is higher than the discount rate, then the project is profitable.

The assessment of the financial profitability of public projects should not be a decisive element when considering whether to implement the investment or reject the idea of it, since they usually do not generate any revenues.

Hence, making a decision to implement the project, despite the negative values of the financial indicators, should be considered acceptable, but the final confirmation of the justification of such an investment should be reflected in the economic
analysis.

The key element in the financial analysis of public investment projects is to determine their financial sustainability. A project can be considered sustainable when the risk of running out of funds in the future (both in the investment phase and in the management phase) is expected to be equal to zero. Hence, the project initiators should explain how the possible lack of funds in a particular project (if identified) will be covered, in order for the entity responsible for implementing the project/ entity that will manage the infrastructure to have

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positive cash balance in the investment scenario at the end of each fiscal year.11

[11] For more information on financial viability analysis, see Section 2.7.7. in *the Guide to cost-benefit analysis of investment projects.*

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9. Chapter 9. Economic Analysis

Economic analysis is a process that evaluates whether a project benefits society as a whole and contributes to economic growth. It considers the costs and benefits to society and measures the value that the project creates for all stakeholders in order to determine whether the investment will bring benefits to society. It offers a broader approach than financial analysis, which focuses on the project itself, but is closely related to it.

and arises from it.

9.1. Methods and assumptions

In this part of the feasibility study, the following should be listed, described and explained:
the methods and assumptions used to conduct the economic
analysis.

What is characteristic of the majority of public projects is that they are not financially viable (often they do not generate financial income at all).
However, the justification for their implementation is checked by analyzing the extent to which they meet the needs of society and by determining whether the economic resources allocated to the project are effectively used.

Economic analysis is conducted from a monetary perspective, but the financial flows used in the financial analysis should be checked and adjusted to economic flows, eliminating significant market distortions and measuring externalities.

effects generated for the economy in the form of costs and benefits for which there are no market prices (e.g., time, health, education).

For a closer understanding of the methodological strategy to be implemented, please refer to Section 2.8 of the EU Guidelines.

9.2. Valuation of benefits and costs, including emissions

greenhouse gases

The basic procedure for conducting an economic analysis consists of 4 main steps:

Step 1. Fiscal adjustments

Financial cash flows often contain items that are merely transfers within the domestic economy and do not represent economic costs, such as the use of resources. Such transfers are fiscal liabilities, such as import duties.

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duties, excise duties, VAT, other indirect taxes and income tax from wages, and should
are exempt from economic analysis.

Step 2. Conversion of market prices into economic/shadow prices

The conversion of market prices into economic prices or shadow prices is then carried out.
when market prices cannot accurately reflect the opportunity cost of
the inputs and the outputs.

It may happen that input prices are distorted and, in that case, a need arises
by correcting them through the use of conversion factors or other methods to reflect the true economic cost of the resources. This can often be observed in inefficient markets where the public sector or operators exert influence, such as through subsidies for renewable electricity generation or through pricing strategies including margins above marginal costs in a monopoly scenario. On the other hand, outputs,

from time to time, are provided at no cost or for a minimal fee
regulated by the applied tariffs, which may not reflect the actual
opportunity cost of inputs because it takes into account availability and
capital. Therefore, measuring the "willingness to pay" of users is of
essential importance for determining the economic price.

Willingness to Pay (WTP) is the maximum amount a user would pay to receive a public service. Willingness to Accept (WTO) is the minimum amount someone would accept to live with a certain amount of discomfort. WTP and WTO can be estimated using revealed preferences, which are technically less

challenging, or stated preferences, which require expert advice on
designing and interpreting surveys. It is important to use sensitivity analysis when benefits/costs are essential to carrying out the
the decision.

Market distortions often affect labor, land, utilities, and goods. For further insight into market distortions, see Section 2.5 of the Economic Appraisal Vademecum.

Step 3. Inclusion of external costs/benefits

External costs or benefits are those that are not reflected in the market price of a good or service. They also affect third parties who have no control over the occurrence of the cost or the creation of the benefit.

There are external costs or benefits specific to each sector. For example, in public transport, time savings are considered a benefit, while in the

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health, prolonging life or preventing premature death are external benefits.

There are also external costs that need to be taken into account, such as noise or greenhouse gas emissions. The costs of increasing or reducing greenhouse gas emissions are an important factor in international projects. The impact of greenhouse gases is global, long-term and subject to international obligations, so this should be elaborated in the documentation with particular care. The amount of emissions that are additionally emitted or stored in the atmosphere as a result of the project should be quantified in the analysis. The next step consists of valuing the external cost by applying a unit cost for the CO2 equivalent. For more information on this measure, see Section 2.5 of the Economic Appraisal Vademecum.

There are several rules for valuing economic costs and benefits:

- proportionality: the effort to analyze costs and benefits should be proportional to the size of the project. For larger projects, a more detailed analysis is required;
- incremental approach: costs and benefits should be assessed relative to option “0” (the “no project” scenario);
- using real prices: the identified costs and benefits should be show and describe, along with their monetary valuation.

Step 4. Discounting net cash flows

The calculation of economic performance indicators (such as economic net present value and economic internal rate of return) involves assigning present values to future costs and benefits. This practice is based on society's preference for consuming goods and services today rather than in the future.

tomorrow.

During the calculation process, it is essential to align the reference period for the economic analysis with the one used in the financial analysis.
The application of the social discount rate is key to determining economic indicators. While countries are free to set their own specific social discount rates, in the absence of such rates, a standard rate, such as 5%, is applied in each calculation of the present value, as set out in the EC Guidelines and the Vademecum (Handbook for Economic Assessment 2021-2027).

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The residual value should be integrated into the calculation of economic indicators. In cases where the reference period is aligned with the economic life of the project, the residual value is usually 0. However, if certain public assets/components retain economic value after the end of the reference period or have the potential to be resold on the market, the benefit derived from the residual value can be included in the last year of the analysis. It is recommended to estimate the residual value by calculating the residual value of the public assets/components based on standard accounting formulas for depreciation (book value).

9.3. Analysis of effects not covered by the economic assessment

Not all costs and benefits can be precisely quantified in monetary terms. The purpose of this part of the feasibility study is to comprehensively describe and explain the costs and benefits that cannot be monetized (i.e., due to the lack of specialized analyses). These aspects should be expressed as physical quantities whenever possible. From

It is crucial to maintain transparency in content, through unambiguous
presenting the underlying assumptions, which will allow evaluators to examine them in detail and, if necessary, re-examine them.

9.4. Cost-benefit analysis and economic indicators

Once all costs and benefits of the project have been quantified and estimated
in monetary amounts, then the economic result of the project can be measured by
using the following indicators:

- economic net present value (ENPV) is the difference between the discounted
  total social benefits and costs;
- economic internal rate of return (EIRR) is the discount rate that generates
  value equal to 0 for ENSW.

Essentially, any project with an EIR lower than the social discount rate or a negative EIR should be rejected. A project with a negative economic return overuses socially valuable resources while providing negligible benefits.

benefits for the majority of the population.

The specific application of economic analysis varies across sectors. When it comes to sector-specific approaches, it is recommended to use the EC Guidelines and the Economic Appraisal Vademecum 2021-2027.

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(Economic Assessment Handbook 2021 – 2027). These documents provide insights (including case studies) tailored to different sectors:

- research and innovation;
- renewable energy sources;
- energy efficiency;
- municipal waste management;
- transportation;
- IT and telecommunications;
- water and wastewater;
- health;
- information and communication technologies: e-services.

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10. Chapter 10. Analysis of "value for money" in public-private partnerships

partnerships

10.1. Methodological approach

This Chapter of the feasibility study refers only to projects to be implemented through the establishment of a public private partnership (PPP). The aim is to justify the choice of this public procurement option.

PPP is a way of implementing public projects in a form that is an alternative to standard public procurement. The analysis that compares the efficiency of project implementation through the establishment of a PPP with the standard way of

implementation by a public entity is called a “value for money” (VMP) analysis.12

Value for money analysis should be carried out for any project planned to be implemented through a PPP after its feasibility (including economic viability) has been confirmed. Its purpose is to answer the question of whether the project in question should be implemented through a PPP or using a standard public procurement procedure.

The IPP analysis should be conducted for projects that are identified during the CMP preparation phase as potentially feasible through the PPP model, when the initial reasons for considering this approach have already been identified.

Also, if new factors justifying this method of public procurement are identified during the project appraisal, project initiators should include the GDP analysis in the (pre)feasibility study.

Value for money analysis includes both qualitative and quantitative
analysis.

10.2. Qualitative analysis of GDP

The purpose of the qualitative value for money analysis is to assess whether the procedure for establishing a PPP can provide benefits to society. To this end, the project initiators should answer the following questions given in the table below.

[12] A comprehensive approach to value for money is presented in *Value for Money Assessment.*
(Value for money assessment). Review of approaches and key concepts, European Investment Bank, 2015, available
at https://www.eib.org/en/publications/epec-value-for-money-assessment

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Table 3. Qualitative analysis of GDP

No.	Area	Key questions
1	Project scope	• Is the project scale large enough that any efficiency improvement is likely to offset the procurement costs?
2	The time required for completion on the project	• Does using the PPP model for project implementation purposes enable its faster implementation? • Does using the PPP model reduce the risk of delays compared to the standard public procurement procedure?
3	Division of work tasks on	• Does implementing the project using the PPP model enable the provision of better quality infrastructure in the long term compared to the standard public procurement procedure? • Will the quality of services provided by the using the PPP model? Can the same level of service quality be ensured by applying standard public procurement? • Does the private partner have greater experience/expertise than the the public partner in providing services? • Is a certain expertise required to implement the the project?
4	Risk sharing	• Will the private partner be able to manage the transferred risks better than the public entity when using the model of PPP? • Could these risks be transferred to contractors when Is the standard investment model used to implement the project?
5	Costs during the lifespan of the project	• Is the project complex enough to enable private partners to provide innovative design, construction and management solutions that together would generate synergies to improve efficiency? • Is there potential for innovation? Is it different for investment models for project implementation?
6	Fees for users and third parties sides	• In the PPP model, can the private partner generate additional revenues and thus reduce user fees?

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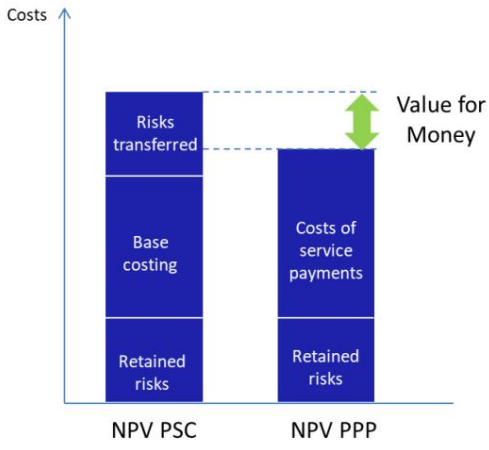
7	Public spending means	• Have the benefits of determining the the long-term costs of the project? • Will using the PPP model for a particular project allow the public entity to implement other projects thanks to the majority of available funds in the short term?
8	Market interest	• Is there evidence that there are enough potential private partners who are interested and have the capacity to implement the project? • Does the nature of the transaction (for example, its strategic importance) indicate that the market will consider it a worthwhile venture?
9	Ability to define and track the results	• Can the outputs and quality of contract implementation be easily monitored?
10	Characteristics of Future Demand	• Is the demand for services provided under the project subject to rapid changes as a result of changes in technology?

If the answers to the above questions confirm that there is potential for successful implementation of the project through the establishment of a PPP, then the initiators of the project should proceed to a quantitative analysis. However, it is also crucial to examine the capacity of the project initiator/proposer to manage the procedure for establishing a PPP. If the initiator/proposer does not possess the necessary knowledge and experience, this will pose a major threat to successful implementation. If necessary, such aspects should be included in the analysis of risks.

10.3. Quantitative analysis of GDP

The quantitative analysis of GDP is based on comparison of financial flows in the public sector in both scenarios.

For this purpose, it is necessary to establish a financial model for the implementation of the project through the standard public procurement procedure (discounted cash flow method, DPT), the so-called Public Sector Comparator (PSC).



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The present value of the cash flows in the PPP model is compared with the present value of the cash flows of the public partner in the PPP model over the same analysis period, applying the same interest rate.13 When developing the Public Sector Comparator model, which presents cash flow projections for the scenario in which the public authorities implement the project, it is necessary to take into account

Several important steps must be taken into account to be comparable to the PPP establishment model. The steps are given in the table below.

*Translation note – chart translation: Costs, Transferred Risks, Base Costs, Retained Risks, NPV of PPP, Costs related to payments for services provided, Retained Risks, NPV of PPP, Value for Money Invested

[13] The key assumption is that the parameters of the specific project are the same for both investment implementation models, in terms of the material scope and standard of the facility, as well as in terms of the services provided. However, this does not imply an equal level of costs and/or revenues in both scenarios.

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Table 4: Steps in the quantitative analysis of GDP

No.	Step	Comment
1	Identification on expenses and income and projections for the money project implementation flows, using the the standard public procurement procedure	Projections will include capital expenditures, operating costs, working capital, revenues collected from users and third parties (if any), tax flow modeling, etc. It should also be taken into account that the public entity may start the implementation of the project on a date different from that in the PPP model (implementation timelines may differ between scenarios). The discounted net costs of implementing the project in the CSP model at this stage are called the base costs.
2	Risk Consideration in the CJS Model	In each variant, in order to quantify the risks that can be transferred to private partners, it is necessary to first identify risks and allocate them between the public entity and the private partner. The public sector comparator should take into account the value of the risks that would be transferred to the private partner if the project were implemented by establishing a PPP14 . If a specific risk is shared between the public entity and the private partner, the PPP model should only consider the risk that would be transferred to the private partner if the project were implemented by establishing a PPP. transferred to the private partner if the project is being implemented with establishing PPP.
3	Inclusion of the difference in the socio-economic costs and benefits in the KJS model	Although both scenarios consider the same project, the methodology for calculating the value for money invested allows one to take taking into account the differences in the time plan for implementing a specific project, which may result in later availability of the public asset or later provision of services.
4	Activation financial neutrality	It is important to ensure that differences in tax flows do not affect the results of the analysis and comparison of the standard option with the option of establishing a PPP. The potential benefits of tax exemption or less tax paid in the PPP model should be adjusted accordingly.
5	Calculation of the NSV in the KJS model and GDP coefficient	Calculating the present value of the flows determined by the Public Sector Comparator and comparing it with the present value when using the PPP model, while using the same discount rate, is the last step.

If, as a result of comparing the present values for the two project implementation models, the resulting present value of the public

[14] Risks that, regardless of the adopted scenario for implementing the investment, remain in the public sector (so-called retained risks) should not be included in the quantitative analysis of value for money, as it will not make a difference across scenarios.

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entity in the case of establishing a PPP is higher than the values estimated with the CSP, this indicates a greater efficiency of using the model for establishing
PPP.

Ultimately, the decision to choose the project implementation method must be based on qualitative and quantitative analysis, including market research, which should provide an answer to the extent to which market participants are able to implement the project.
complete the project within the assumed parameters.

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11. Chapter 11. Environmental and Social Impacts

11.1. Environmental impact (including adaptation and climate change mitigation)

In this part of the feasibility study, answers to the following questions should be provided:

- Is the project in line with national, regional and local environmental protection strategies?
- How does the project meet the obligations set out in national environmental protection policies and how does it help achieve the relevant objectives?
- Does this project require an Environmental Impact Assessment (EIA) according to law?
- If required, what are the results of the EIA?
- If not required, what is the expected impact of the project on the environment?

  environment?15
- If any negative environmental impacts are expected, what are the planned mitigation measures and what are the remaining, acceptable impacts?
- What is the expected impact of the project on climate change (in terms of greenhouse gas emissions)?16
- Is the project in line with national and/or sectoral strategies and plans for decarbonization and climate change adaptation?
- Does the conceptual solution include measures for climate change mitigation and adaptation?
- Does the project demonstrate resilience to climate change under different climate change scenarios?

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[15] If relevant, impacts must be considered not only in the area covered by the project, but also in adjacent areas, such as downstream areas, groundwater and ambient air.

[16] If a significant increase/decrease in greenhouse gas emissions is expected, such increase/decrease should be valued in monetary terms within the economic framework.

analysis.

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It is common for investment projects to have certain negative environmental impacts, which should be expressed quantitatively whenever possible, for example, the degree of negative environmental impact and the number of persons/ households affected by such impact. If significant negative environmental impacts are identified, mitigation measures need to be planned and implemented to address these negative environmental impacts.

consequences of the project.

This Chapter of the feasibility study should summarize the expected negative impacts on the environment and the proposed ways to mitigate them, and

They should also be included in the calculations within the framework of the economic analysis, which will allow them to be valued from a monetary perspective.[17]

11.2. Impact on social aspects

In this section, project proponents should show how the project will affect different groups of people. Unlike economic analysis, which values the non-market impacts of a project in monetary terms (as explained in Chapter 9 of this Guide), the purpose of a social impact assessment is to analyse how the costs and benefits of an investment will be distributed among different groups in society. Social impact assessments usually take into account the impact of the project on income levels, poverty, unemployment, gender equality and minorities. Since certain projects may specifically target the needs of vulnerable groups, social impact assessments can be an important factor that decision-makers take into account in the selection and prioritisation phases of projects. Sometimes preference may be given to

that project that results in strictly desired impacts on social aspects over those projects that provide greater benefits for all, i.e. have a higher
ENV or ESP.

It is recommended that the identified target groups be involved in constructive
consultations with stakeholders and present the findings together with
subsequent, planned or adjusted activities arising from the discussions. This Chapter of the feasibility study should also present the proposed mitigation measures aimed at addressing negative impacts.

[17] If direct monetary valuation is not possible, then methods for transferring value should be used.
the value.

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the target groups affected, as well as the way in which the impacts on social aspects.

The purpose of this activity is to provide relevant evidence that the project's impacts on social aspects have been adequately considered, as well as that potential negative effects on social aspects will be mitigated to an acceptable level. If a specific project has a negative impact on certain interest groups, special attention should be paid to it in order to avoid potential disputes and delays in its implementation.

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12. Chapter 12. Implementation and operational sustainability

12.1. Capacities of the entity responsible for implementing the project and of the entity that will manage the infrastructure

The purpose of this section is to determine the ability to effectively implement the project. The scope and complexity of the project in relation to the resources available - both quality and quantity - to the proposing entity should be taken into account. The entity's previous experience in similar projects should also be presented. This is particularly important for projects that will be implemented through the establishment of a PPP. In cases where

internal resources are not sufficient, it is essential to apply a pragmatic approach, outlining strategies for obtaining external support.

The project initiators should provide a description of the capacity of all relevant entities to implement the project and its operational sustainability in relation to
the following:

- Financial capacity

The description should briefly present the results of the financial viability analysis, which confirms at least the financial situation of the entity responsible for implementing the project and the entity that will manage the infrastructure (if different), and shows the potential/ability of the entity to guarantee the liquidity to provide adequate financial resources for the project, which would ensure its successful implementation and management in the future (in addition to the entity's other activities/ responsibilities).

- Technical capacity

The description should, first of all, provide an overview of the expertise required to implement the project and indicate the number of employees who possess such expertise within the organization and who are assigned to the project.

- Legal capacity

The description should, first of all, state the legal status of the project initiator/proponent, the legal basis that allows him to implement the project, and his capacity to take legal action (if necessary).

- Organizational capacity

The description should, first of all, include: (1) a list of similar projects that the entity responsible for implementing the project/entity that will manage the infrastructure has implemented in the last ten years and, if there are none,

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examples, then it should be stated whether the needs for technical assistance have been considered; (2) the institutional set-up and structure, such as the existence of
A Project Implementation Unit (PIU) that has the capacity to implement and manage the infrastructure and, if possible, include the proposed
organizational chart for implementation and management of the infrastructure.

12.2. Overview of the project management structure

This section should outline the project management structure. It should explain who is responsible for specific project tasks. It should also confirm
that the tasks are appropriately distributed, taking into account the experience and resources of the staff involved. The project initiators should describe how the implementation of the project will be organised during the implementation phase and in the management phase. The aim is to demonstrate that the risks associated with
project management are kept to a minimum.

If the chosen option involves establishing a PPP, the roles and responsibilities of the parties, as well as the sharing of risks, should be clearly described.

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13. Chapter 13. Risk analysis and sensitivity analysis

Risk refers to an unpredictable event or circumstance that, if it occurs, could have a negative impact on the project. Risks arise from
uncertainties inherently related to key aspects of the project, such as,
example, investment costs and operating costs, the time frame for
implementation or the offer. The materialization of these risks may hinder the implementation of the project or significantly reduce the expected benefits.
Therefore, conducting a thorough risk analysis is a key step in the development
on the project.

An initial risk analysis must be carried out in the planning phase, in order to avoid unacceptable risks in the final design. The project initiators should review the results of the risk analysis in the Project Concept Form. The risk analysis should be updated in the (pre)feasibility study, as well as expanded to include more detailed data collected during the

of the estimate.

It is recommended that the following steps be applied when preparing the assessment of
the risk related to the project:

- identifying and assessing risk;
- selection of measures to prevent and mitigate risk;
- determination of residual risk;
- climate change risk assessment and selection of adaptation measures;
- sensitivity analysis.

13.1. Risk analysis

Risk analysis and risk management provide a structured approach to identifying, assessing and controlling the risks that may arise in
throughout the project's life cycle.

The first step consists of identifying the relevant risks, which can be
classified into the following categories:

- construction-related risk (for example, the investment is not completed on time, within budget, or in accordance with specifications);

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- risk related to future demand (i.e. demand for the offered products/services does not correspond to projections);
- risk associated with the conceptual solution (for example, the conceptual solution does not deliver the services according to the required performance or quality standards);
- economic risk (for example, external factors, such as inflation rates or exchange rate fluctuations, affect the costs or benefits of the project);
- environmental risk (for example, negative impact of the project on the environment – air pollution, noise, climate change);
- financing risk (for example, when there is a change in the availability of financing, leading to a delay in the implementation of the project or a change in its scope);
- political and legal risks (for example, changes in laws, such as tightening of environmental protection standards; increased project costs; policy changes; administrative changes);
- risk related to operations and maintenance (for example, operating costs for newly constructed infrastructure differ from those planned in the budget);
- risk related to public procurement (for example, disputes arising from contracts or insufficient capacity of contractors);
- technological risk (for example, when services are provided using inappropriate/outdated technology as a result of rapid technological development);
- climate change risk (for example, when the project is exposed to disasters as a result of climate change during the investment implementation or management phase);
- disaster-related risk (for example, when the project is exposed to any natural disasters during the investment implementation or management phase);
- socio-economic and risks related to equality/gender, minority/vulnerable groups (e.g. discriminatory reasons, accessibility issues, public opposition, inadequate communication between actors involved in the project).

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The second step is risk assessment. For each identified risk, the probability of its occurrence and the magnitude of its potential impact should be determined.
impact (intensity). [18]

The probability of the risk occurring can be determined by assigning a number from 1 to 5, where:

- 1 – very unlikely (0 to 10 percent probability);
- 2 – unlikely (11 to 33 percent probability);
- 3 – almost as likely as unlikely (34 to 66 percent) probability);
- 4 – probable (67 to 90 percent probability);
- 5 – very likely (91 to 100 percent probability).

The magnitude of the impact (intensity) of each individual risk can be assessed by assigning a number from 1 to 5, where:

- 1 – insignificant (no relevant impact on well-being in society, even without corrective actions);
- 2 – minor (minor disruption to the well-being of society caused by the project, with minimal impact on the long-term effects of the project. However, corrective actions are required.);
- 3 – moderate (disturbance to the welfare of society caused by the project, mainly financial damage, even in the medium and long term. The problem can be solved with corrective actions.);
- 4 – critical (major disruption of societal well-being caused by the project; the occurrence of the risk causes the loss of the primary function(s) of the project. Corrective actions alone, even comprehensive ones, are not sufficient to avoid serious damage);
- 5 – catastrophic (project failure that may result in significant or even complete loss of project functions. The primary effects of the project will not be achieved in the medium and long term);

[18] The approach, including the classifications of probabilities and risk levels, derives from the Guide to *Cost - Benefit Analysis of Investment Projects*, EC, 2014.

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The risk level for each identified risk can be determined based on this activity. It is recommended to prepare a risk matrix, as shown in
the example below.

Table 5: Example of a risk matrix

		Size of impact (intensity)				
		insignificantly small		moderately	critical	catastrophically
Probability	very likely	low	low	low	low	medium
	incredible	low	low	medium	medium	tall
	almost the same probably as much as it is incredible	low	medium	medium	tall	tall
	probably	low	medium	tall	very tall very tall	
	very likely	medium	tall	very high very high	very high	

Source: Guide to Cost-Benefit Analysis of Investment Projects, European Commission, 2014

year

The next step is to select appropriate risk mitigation and prevention measures.19 In this step, project initiators need to balance the additional costs associated with the specific measures against their impact on the level of risk arising from the project. Even after implementing risk mitigation/prevention measures, there is still some residual risk. If the residual risk is assessed to be significant, then a quantitative risk analysis may be necessary.20

Finally, it is recommended to create a table that shows each risk with its probability of occurrence and its potential impact, the overall
level of risk, the potential effect of its occurrence, the selected mitigation/prevention measures and the residual risk. The project initiators must
justify the selected risk reduction measures and demonstrate that the residual risks are at an acceptable level.

19 Mitigation means reducing the magnitude (intensity) of the potential
impact, and prevention refers to reducing the likelihood of occurrence.

20 See: *Guide to Cost-Benefit Analysis of Investment Projects,* EC, 2014, pp. 71-73.

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Table 6: Project Risk Assessment

Risk	Probability	Influence	Level of risk	Effect of the occurrence	Prevention/mitigation at risk	Residual risk
Example 1	2	3	moderate	[description]	[description]	[description]
Example 2	5	4	very tall	[description]	[description]	[description]

Source: based on Guide to Cost-Benefit Analysis of Investment Projects, European Commission, 2014

Climate change risk assessment

The uncertainties and complexities associated with climate change and the severity of the threat posed by disasters caused by climate change require the implementation of a separate climate change risk assessment. In this section, project initiators/proponents are expected to focus on exclusively on the risks associated with climate change, which relate to However, such an assessment is based on a similar logic to that used in general risk analysis, and should therefore be considered complementary to it.

A preliminary assessment of climate change-related risks should be carried out as early as the preparation phase of the Project Concept Note. These initial results should be re-evaluated during the preparation phase of the (pre)feasibility study based on more detailed data available. If in

the initial assessment of the risks associated with climate change are not identify significant risks related to climate change, and the re-evaluation confirms such a conclusion, this is sufficient reason to use the findings presented in the OCP with appropriate justification.

However, if significant climate change-related risks are identified in the OCP either during the project appraisal, or if there are changes to the conceptual design, a more detailed climate change risk analysis needs to be conducted during the preparation of the (pre-)feasibility study.

One of the first tasks in conducting a climate change risk assessment is to decide which set of climate change projection data will be used to determine the project's vulnerability to climate change. It is recommended to use national databases, but if they are not available,

available, alternative sources may also be considered:

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- Climate Change Monitoring Service within the framework of the Copernicus Programme (Copernicus Climate Change Service);
- European Climate Change Adaptation Platform (European Climate Adaptation Platform);
- European Commission Joint Research Centre Joint Research Centre);
- Knowledge Management Center on Risk Management disasters (Disaster Risk Management Knowledge Centre);
- European Environment Agency;
- Intergovernmental Panel on Climate Change Data Distribution Centre (IPCC Data Distribution Centre);
- World Bank Climate Change Knowledge Management Portal (World Bank Bank Climate Change Knowledge Portal);

and other resources, such as national risk assessments (when necessary and available).[21]

Climate change risk analysis consists of two phases: screening and detailed analysis.[22]

Screening

The screening consists of three phases:

- sensitivity analysis;
- exposure analysis;
- vulnerability analysis.

Sensitivity analysis

First, all climate change-induced hazards that are relevant to the specific type of project, regardless of its location, should be identified in the sensitivity analysis. The results of the assessment can be

[21] *Technical guidance on the climate proofing of infrastructure in the period 2021-2027,* European Commission, 2021.

[22] The approach recommended in the Feasibility Study Guide is derived from *Technical guidance on the climate proofing of infrastructure in the period 2021-2027,* European Commission, 2021. For more detailed guidance, see the source document.

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summarised in a table showing the sensitivity ranking of all identified climate change hazards for the project.

Table 2: Example of a sensitivity analysis table

Thematic area (examples):	Identified disasters caused by climate change and variables			
	Flood	Drought	Intensity on precipitation	Increase in the temperature
Public asset and processes on the location on the project	high	low	middle	middle
Inputs (for example, water, electricity)	middle	low	low	low
Outputs (e.g. products)	high	low	middle	high
Access and transport network	high	low	low	low
Highest value for the four thematic areas	high	low	middle	high

Source: Technical guidance on the climate proofing of infrastructure in the period 2021-2027, European Commission, 2021

When preparing a sensitivity analysis, project initiators should focus on different components of the specific investment and should determine how the project functions within a broader system or with which networks it is connected.
connected.

Exposure analysis

The main objective of the exposure analysis is to identify which hazards caused by climate change or other variables are relevant to the project location, regardless of its type. The assessment can be divided into two parts: (1) exposure to existing climate conditions and (2) exposure of a given location to
future climate conditions. In this section it is important to consider both historical and
current data, as well as projections of future climate conditions based on available climate models (e.g., ThinkHazard23 , World Bank Climate and Disasters Risk Screening Tools (World Bank Tools for Screening Risks Related to

23 https://thinkhazard.org/en

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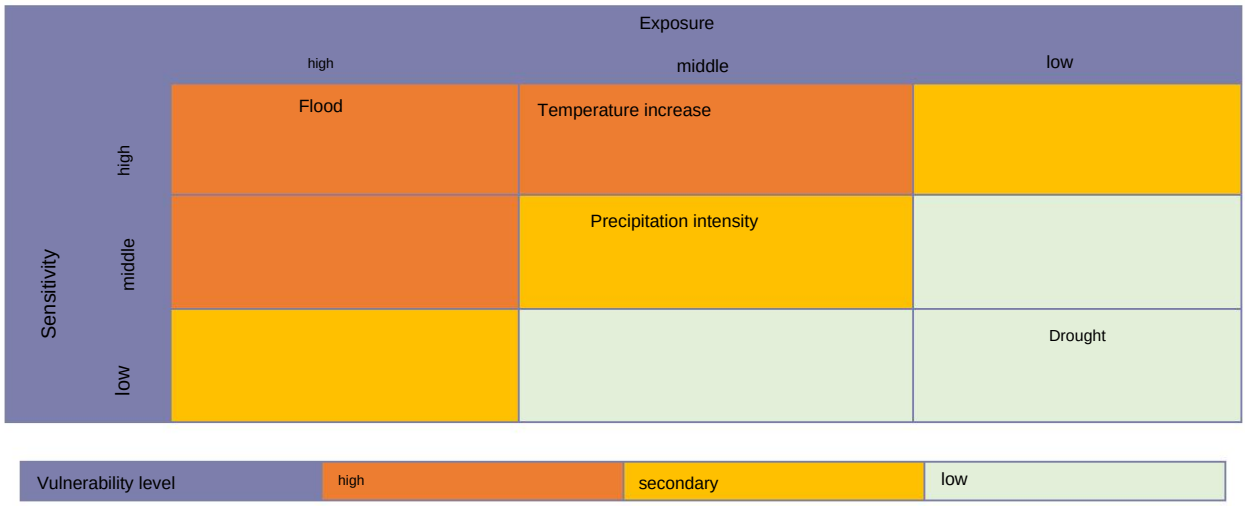
climate change and disasters24)) and/or national/regional/local strategic documents, for example, an urban plan.

The assessment of both aspects – the sensitivity of the project type and the exposure of the project location – should be conducted qualitatively, using a three-step approach.
scale: low, medium and high, for each potential disaster caused by
climate change.

Vulnerability analysis

Vulnerability analysis is a combination of the results of sensitivity analysis and
the exposure analysis.

Table 3: Example of a vulnerability analysis table



Source: authors, based on Technical guidance on the climate proofing of infrastructure in the period 2021-2027, *European Commission, 2021*

The vulnerability assessment helps identify the most relevant climate change hazards for the project. If the analysis reveals the existence of hazards with a high or medium level of vulnerability, the project initiators should proceed to a detailed climate change risk assessment.

Detailed climate change risk assessment

The second phase of climate change risk assessment is based on a similar
logic that is represented in general risk analysis.

24 https://climatescreeningtools.worldbank.org

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Any climate change-induced disaster to which the project's vulnerability is medium or high (as identified in the first step) should be assessed.
from two aspects:

- probability of a particular risk occurring during the project lifetime; the same probability classification (scale from 1 to 5) as in the general risk analysis can be used. Probabilities should be considered over the entire project lifetime; it is recommended to use the “medium” scenario SSP2-4.5 for future climate conditions, which assumes a temperature increase of 2.7 °C by the end of the century.25

- the potential impact relating to the consequences of the occurrence of a particular climate change risk, and which consequences may relate to different risk areas (physical public assets and operations, health and safety, environmental impacts, social impacts, impact on accessibility for people with disabilities, financial implications and reputational risk).26 For the purposes of assessing the potential impacts of climate change risks, it is recommended to use the same scale from 1 to 5 as in the general risk analysis.

Climate change risk analysis is a combination of the results of the probability analysis and the impact analysis, so that each hazard can be assigned a certain level of risk (low, medium, high and very high). The assessment can be presented in a separate risk matrix in order to allow easy identification of the most significant potential hazards caused by climate change for which risk reduction measures should be taken.

Selection of climate change adaptation measures

Based on the results of the climate change risk assessment, project initiators should consider the need to incorporate any adaptation measures. This process also consists of three steps:

[25] *Climate Change 2021: The Physical Science Basis,* Intergovernmental Panel on Climate Change, 2021.

[26] It is recommended to follow the EU *Technical guidance ,* which provides information on what a certain level of risk consequence means in individual risk areas. See: *Technical guidance on the climate proofing of infrastructure in the period 2021-2027,* European Commission, 2021, pp. 37-38.

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- identifying adaptation options that are appropriate to the identified significant risks;

- assessment of adaptation options (with expert opinion or cost-benefit analysis, where necessary) 27;

- adaptation planning, which involves integrating the selected options into the project design and/or the use of the infrastructure.

Adaptation measures may include: (a) structural solutions (e.g., changes in the project design or in the specification of the physical public asset) and/or (2) non-structural solutions (e.g., utilization planning).
land use, improved monitoring or emergency intervention programmes, staff training and skills transfer activities, development of strategic or corporate frameworks for climate change risk assessment, financial solutions, such as supply chain disruption insurance or alternative services). The selected adaptation measures should contribute to reducing the remaining risks to an acceptable level.

13.2. Sensitivity analysis

The purpose of sensitivity analysis is to identify key parameters, such as capital expenditures or future demand for products/services, whose changes would have the greatest impact on the financial and economic indicators of the project (especially FNSV and ENVV).

These variables are identified by changing the parameters one by one and determining the effect of each of those changes on the project's performance. If a 1 percent change in a particular parameter leads to a change of at least 1
percentage in FNSV/ENSV, that variable can be considered "critical" for the success of the project and hence it should be handled with care and should be addressed accordingly.
conducted a detailed analysis of it.

The parameters to be processed in the sensitivity analysis should be selected in a way that takes into account the specificity of a particular project, the sector to which it belongs and the target beneficiaries.

[27] If the climate change risk assessment shows that the threats posed by climate change could significantly affect the feasibility of the project, and that the costs of minimizing them are high, then it is recommended to conduct a cost-benefit analysis to assess the cost-effectiveness of implementing the adaptation options considered. The analysis can then be incorporated into the options analysis (see Chapter 5).

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Examples of variables that can be analyzed as part of the implementation of
The sensitivity analysis is:

- macroeconomic indicators (for example, inflation rate);
- capital expenditures;
- projections for future demand (e.g., for products/services, projections for traffic intensity);
- prices of the products/services offered;
- unit prices of the main categories of operating costs (for example, electricity prices);
- unit values of assumed economic benefits, external costs/benefits, non-market impacts (e.g. value of time, emission costs).

It is important to remember that in practice variables are sometimes interdependent.
or are subject to systematic bias in the assessment, and hence it is recommended to conduct several scenario analyses, in which several key parameters are changed simultaneously, in order to adequately test the sensitivity of financial and economic indicators. First of all, two pessimistic scenarios should be prepared - (1) a less pessimistic and (2) a worst-case scenario, each containing different combinations of key assumptions or variables - and

test.

It is proposed to test the results of the investment assuming
the following:

- increase in total capital expenditures by 10 percent;
- increase in total capital expenditures by 25 percent;
- reducing the total value of economic benefits by 10 percent;
- reducing the total value of economic benefits by 25 percent;
- a simultaneous increase in total capital expenditures by 10 percent and a decrease in the total value of economic benefits by 10 percent -
  less pessimistic scenario;
- a simultaneous increase in total capital expenditures by 25 percent and a reduction in the total value of economic benefits by 25 percent.

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14. Chapter 14. Conclusions on the feasibility of the project

The purpose of this section is to draw conclusions from the previous chapters of the (pre)feasibility study, which clearly establish the feasibility of the project and provide a recommendation for its implementation. In general, for a project to be considered feasible, it needs to meet various criteria covering legal, technical, financial, environmental, social and economic aspects, which have been extensively reviewed in the previous sections of the (pre)feasibility study.

Although a positive economic net present value is usually considered a key factor, it may not be sufficient in making a positive valuation decision.
However, there may be exceptions where a project with a marginally negative ENSV would still be recommended for a positive assessment, for example because of significant benefits for vulnerable groups in society or significant environmental benefits that are difficult to monetize. On the other hand, a project with a marginally positive ENSV may be recommended for a negative assessment if it has significant negative impacts that cannot be monetized or if it is extremely sensitive to fluctuations in the estimated costs and benefits, as shown by the analysis of

sensitivity.