Government of Cyprus

Manual for Pre-Selection and Appraisal of Public Investment Projects

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List of Abbreviations

ABB	Activity-based budgeting
BCR	Benefit-cost ratio
CBA	Cost-benefit analysis
CEA	Cost-effectiveness analysis
CPI	Consumer price index
DG EPCD	Directorate General for European Programmes, Coordination and Development
EIA	Environmental impact assessment
EIRR	Economic internal rate of return
ENPV	Expected net present value
FIRR	Financial internal rate of return
FRBSL	Fiscal Responsibility and Budget Systems Law
ICT	Information and communications technology
MCA	Multi-criteria analysis
MIRR	Modified internal rate of return
MTBF	Medium-term budget framework
NPC	Net present cost
NPV	Net present value
PCN	Project concept note
PIM	Public investment management
PPP	Public-private partnership
SIA	Social impact assessment
VAT	Value added tax
VSL	Value of a statistical life
WACC	Weighted average cost of capital
WTA	Willingness to accept
WTP	Willingness to pay

Part I: Scope of the Manual and Definitions

1. Legal Basis for the Manual

This Manual (the 'Manual') is issued by the Minister of Finance under the authority granted by the Fiscal Responsibility and Budget System Law (FRBSL). Part XI of this Law specifically regulates the selection and implementation of public investment projects and Article 89 therein gives the Minister of Finance the authority to determine:

> *'…the procedures, methodologies, criteria and other requirements, as well as any other information he/she deems necessary for the implementation of this Part [XI], by issuing regulations and/or instructions.'*

Further authority for the Manual derives from the Public Investment Management (PIM) Guidelines issued by the Minister of Finance and approved by the Council of Ministers. The PIM Guidelines, which have the status of a regulation under Article 89, elaborate the relevant articles of the FRBSL and provide the overarching framework for public investment projects within which the Manual fits. The Manual must be consulted in conjunction with the PIM Guidelines.

The Manual has the status of an instruction as referred to in Article 89 and the PIM Guidelines.

Article 84 of the FRBSL prescribes a pre-selection process by which the head of an economic entity must draw up and submit to the Minister of Finance a report on the parameters of a new project proposal. Based on the preliminary estimates contained in this report, the Minister of Finance will then arrive at an opinion on whether the project should be taken to the next stage. The pre-selection process and the detailed content of the required report is the subject of Part II of the Manual (and supporting annexes)

Article 85 of the FRBSL prescribes the project appraisal process. Once a project has been preselected, the head of the economic entity must draw up and submit a project appraisal report to the Minister of Finance for review. The appraisal report must include a feasibility study which has been prepared according to guidelines issued by the Minister of Finance. The Minister of Finance also issues instructions concerning the criteria for determining whether a project is affordable and economically viable. The project appraisal process, the guidelines on preparation of a feasibility study and the criteria are the subject of Part III of the Manual (and supporting annexes). Projects which meet the criteria and are eligible to move forward to the next stage are entered into a list maintained and updated by the Minister of Finance.

Article 86 of the FRBSL prescribes the selection of projects through the budget process. The budget process will be described in a forthcoming budget manual which will be prepared by the Budget Directorate of the Ministry of Finance. In the current transitional period, this is done through circulars that are adjusted as reforms progress. The Manual completes the PIM Guidelines by providing common methodologies and templates to Ministries for developing and appraising public investment projects. The Manual is aimed at all participants in the identification, pre-selection, appraisal and selection for projects. Participants' roles and responsibilities in relation to the performance of these project stages are established at various points in the Manual; however, even when it is not mentioned explicitly, the guidance in the Manual should be taken into account by all participants, irrespective of their status as project proposer, evaluator, reviewer, or decision-maker.

2. International Good Practice

As illustrated in Figure 1, the Public Investment Management process regulated by the FRBSL, the PIM Guidelines and the Manual has been designed to reflect international good practice[1]. The subject of the Manual is the first three stages shown in Figure 1, i.e., pre-selection, appraisal and selection. Guidance on implementation, monitoring and evaluations will be developed separately.

Figure 1: The Key Features of the Public Investment Management Process

Source: Public Investment Management Guidelines

In keeping with the aim to follow good international practice, the DG EPCD has drawn on the following useful examples in preparing the Manual:

- The Green Book: Appraisal and Evaluation in Central Government, United Kingdom Treasury, 2003 (updated 2011)

  https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-governent

- Public Sector Business Cases Using the Five Case Model, Supplementary Guidance to the Green Book, United Kingdom Treasury

  https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-governent

- The Cost Benefit Analysis Primer, New Zealand Treasury, 2005[2]

  http://www.treasury.govt.nz/publications/guidance/planning/costbenefitanalysis/primer

- Handbook of Cost-Benefit Analysis, Department of Finance and Administration, Commonwealth of Australia, 2006

  http://www.finance.gov.au/sites/default/files/Handbook_of_CB_analysis.pdf

[1] See for example, 'A Diagnostic Framework for Assessing Public Investment Management', A. Rajaram, Tuan Minh Le, N. Biletska & J. Brumby, World Bank Policy Research Working Paper No. 5397, 2010.
[2] Recently updated:
http://www.treasury.govt.nz/publications/guidance/planning/costbenefitanalysis/guide

- Northern Ireland Guide to Expenditure Appraisal and Evaluation, Department of Finance and Personnel

  http://www.dfpni.gov.uk/eag

- Guide to Economic Appraisal: Carrying Out a Cost Benefit Analysis, Part D.03 of Public Spending Code, Central Expenditure and Evaluation Unit, Department of Public Expenditure and Reform, Republic of Ireland

  http://publicspendingcode.per.gov.ie/d-standard-analytical-techniques/

- Toolkit for Improving PPP Decision-Making Processes, Ministry of Finance, Government of India

  http://toolkit.pppinindia.com/start-toolkits.php?sector_id=4

- Guide to Cost Benefit Analysis of Investment Projects, Directorate General for Regional Policy, European Commission, 2014

  http://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/cba_guide.pdf

3. Scope and Content of the Manual

Although many of the methods explained in the Manual can be applied to other areas of public expenditure, the focus of the guidance is on the *ex-ante* verification of the performance of public expenditure on capital investment projects, or 'public investment projects' as referred to in the rest of the Manual. To be within the scope of the PIM system, a public investment project must satisfy the definitions of both capital investment and a project. The relevant definitions are:

> Capital investment: Expenditure on the acquisition of fixed assets and contributing to fixed capital formation.[3] Fixed assets include tangible assets, like public works, buildings, structures, and machinery and equipment, as well as less tangible assets, like software and ICT systems[4]. Capital investment extends to major improvements (renovations, reconstructions or enlargements) of existing fixed assets. Capital investments are distinguished from maintenance and repair because:
>
> - They require a deliberate investment decision that can be taken at any time and that is independent of the asset's condition.
> - They increase the performance or capacity of an existing fixed asset or significantly extend its previously expected service life, thus increasing the value of the asset.
>
> Major rehabilitation of a poorly maintained asset is considered as capital investment.
>
> Project: A project is a group of activities with clearly defined objectives and outputs implemented over a fixed time schedule and through a temporary organisational structure. It should encompass all the activities and resulting outputs required to deliver sustainable benefits to the identified target beneficiaries.
>
> Project Performance: The performance of a project is measured in terms of its economy, efficiency and effectiveness. *Economy* means project inputs will be acquired at an acceptable

[3] The IMF GFS Manual (2014) definitions are applied in the Manual.

[4] According GFS Manual (2014), fixed assets include 'intellectual property products' such as computer software. These come within the definition of 'Other fixed assets'.

quality standard and the lowest cost. *Efficiency* means the quantity of inputs used to produce a given project result/output will be minimised. *Effectiveness* means the project results/outputs will contribute to the successful achievement of the project purpose (and by extension the goal)[5]. It may take some time before there is sufficient evidence to demonstrate that a project has been effective.

The methods and procedures set out in the Manual will eventually apply to all public investment projects no matter what their functional nature or funding source. In the interim, the Government of Cyprus has determined that EU funded projects will follow their own procedures and methods. Where line ministries have already developed their own procedures, such as in the field of ICT projects, these should be harmonised so that they are compatible with the analysis and structure of decision-making embodied in the Manual[6].

The Manual is in four parts, including this introduction. Part II of the manual deals with project Pre-Selection, Part III covers Appraisal. Part IV focuses on the methodology for assessing whether procurement of a project through a Public Private Partnership (PPP) would offer value for money. Part IV only applies to a subset of projects which are positively appraised and are identified as having PPP potential during appraisal.

In line with the Public Investment Management Guidelines, the Manual distinguishes between financially significant and non-financially significant projects, the latter being those projects with total capital costs below euro 5.0 million. The main differences in approach between these two types of project is seen in the appraisal methodology as set out in Part III, which describes a simplified approach for non-financially significant projects. It is noted, however, that, as a rule, projects with total capital costs below euro 0.5 million will be excluded from this process. However, the Minister of Finance reserves the right to request the application of the simplified approach set out in Part III on any project with a total capital cost below 0.5 million if considered necessary.

[5] Project results, purpose and goal are defined later in the Manual.

[6] This should not be difficult where procedures have been developed in accordance with recognised good practice.

Part II: Methodology for Pre-Selection of Projects

1. Main Aims of Project Pre-Selection

Pre-selection is the decision point that concludes the development of an initial project concept. It involves a formal decision on whether to proceed to more in-depth project planning and appraisal. The objective is to exclude from further development those projects that:

- Are inconsistent with government or sector priorities;
- Are unlikely to be economically viable; and / or
- Have little chance of being affordable under foreseeable fiscal constraints.

Pre-selection prevents public financial resources from being wasted on redundant feasibility studies and assists in restraining expansionary pressures on the budget by containing the project pipeline. Pre-selection also provides an important opportunity for the line Ministries to: test the robustness of a project concept in terms of logic, risk and sustainability; reject unsuitable project alternatives; and identify those alternatives that are worthy of further appraisal alongside the reference project[7] concept. The approach to further studies is also outlined. Finally, the pre-selection stage also offers an opportunity to feed lessons from the *ex post* evaluation of similar completed projects, where available, into the initial design of new projects[8]. Given that the availability of *ex post* evaluations of large and complex projects at the present time may be limited, it is essential that from now on *ex post* evaluations are undertaken on such projects so that over time a number of relevant *ex post* evaluations becomes available.

All projects, whether financially significant or non-financially significant, are expected to follow the formal pre-selection process, although some lessening of the intensity of research and analysis is acceptable for low cost, non-financially significant projects with limited recurrent cost implications. The main differences between the approaches to projects of different financial significance occur at appraisal stage, as described in Section 3.4 of Part III.

A positive pre-selection decision requires that the strategic policy relevance, rationale and realism of the project concept has been demonstrated to the satisfaction of the relevant decision-makers and a convincing case has been made to justify expenditure on further planning and analysis.

It is more likely that a project will be pre-selected if the concept arises from a robust identification process. New projects concepts that have not arisen out of a systematic identification process along the lines described below should not be pursued. There are a number of acceptable mechanisms by which new projects may be identified by line Ministries:

- Asset management systems can provide information on the condition and remaining life of specific capital assets – such as service delivery facilities or equipment – and be used to identify those assets requiring replacement in the near future.

[7] Throughout the Manual the project concept or proposal that is the focus of pre-selection and appraisal is referred to as the 'reference project'. Project alternatives are alternatives to the reference project.

[8] This is good practice. Ideally it requires the establishment of systematic ex post evaluation, or at a minimum the preparation of basic project completion reports. This will be established for Cyprus in the next phase of Public Investment Management Reforms.

- Sectoral strategic plans may highlight priority areas for public investment and therefore guide project identification.
- Master plans prepared for key infrastructure sectors can identify specific projects and their priority sequencing.
- Participation by relevant stakeholders, including local communities, in identifying new public investment ideas is also recognised as a legitimate way of identifying project concepts, provided that a structured approach to consultation has been used to arrive at representative findings.

2. Roles, Responsibilities and Decision-Making

Article 84 of the FRBSL governs the pre-selection of projects. According to Article 84, the head of an economic entity is responsible for preparing a Project Concept Note (PCN) describing the parameters of a project. The PCN is the report referred to in Article 84, which is then used by the Minister of Finance as the basis for arriving at an opinion on the project. This Manual outlines the Minister of Finance's instructions on the parameters to be included in the PCN.

Consistent with the FRBSL, the roles and responsibilities at the pre-selection stage are defined in the Public Investment Management Guidelines as follows:

Stage 2.1	Proposer	Evaluator	Reviewer	Decision Maker
Project Pre-selection	Economic Entities	Economic Entities	DG EPCD for initial economic viability; and Budget Directorate for initial affordability	Council of Ministers based on proposal by the Minister of Finance

The first step in the pre-selection process begins with the economic entity, its departments and subordinated units. The head of an economic entity, through the Permanent Secretary or equivalent, is responsible for putting in place formal systems to ensure that project concepts are:

i. Identified through robust processes;

ii. Properly and accurately presented in the PCN; and

iii. Subject to rigorous internal scrutiny by officials not directly involved in the project.

While the responsibility for preparing the PCN rests with the planning unit within the economic entity, it should be done in close coordination with the division or unit that would have responsibility for implementing the project and with the unit responsible for budgeting. It is the planning unit's responsibility to coordinate the translation of the project idea into a coherent project concept. The Minister of Finance, being responsible for the selection and provision of funds for the implementation of the public investment program, reserves the right to verify that adequate internal systems are in place for Public Investment Management, including for identification and pre-selection.

The Minister of Finance issues an opinion about the project on the basis of the submitted PCN. This is the culmination point of the broader pre-selection process. Only projects that have passed internal scrutiny and been formally approved by the head of an economic entity, following approval by the relevant departmental head(s), should be submitted to the Minister of Finance. The DG EPCD and the Ministry of Finance (Budget Directorate) assess the PCNs on the basis of the criteria established in

section 4 below and issues an opinion. The Budget Directorate will focus on affordability issues and the DG EPCD will focus on strategic issues and economic viability. PCNs will also be submitted by DG EPCD to the Department of Environment for a preliminary screening of the project's environmental footprint and to point out the existence of any factors that could impede or even forbid the promotion of the project (no-go considerations). The possible opinions given by the Minister of Finance are: 'accept'; 'reject'; or 'resubmit with revisions'. In the case of rejection, the Minister of Finance will give reasons for rejection. In the case of resubmission, the Minister of Finance will give guidance on where additional information or analysis is required. Proposals rejected on the grounds of strategic relevance and/or economic viability cannot be resubmitted unless there is a demonstrably significant change in underlying conditions affecting the strategic significance and net economic benefits of the project.

Given the importance of affordability considerations, it is important that the relevant ministry strategic unit for the economic entity promoting the project, as constituted in line with the procedures for strategic planning and budgeting, is involved in the scrutiny and approval process. Public investment projects are components of activities under the activity-based budgeting (ABB) system, making it important that internal arrangements for project planning and decision-making are compatible with the ABB process and its related organisational arrangements.

Economic Entities will submit PCNs to DG EPCD and MoF BD simultaneously, at any time during the year. DG EPCD and MoF BD will review the PCNs and those that have been positively reviewed will be discussed during the Reconciliation Framework. No new or resubmitted PCNs can be considered during the Reconciliation Framework.

3. Main Elements for Making Pre-Selection Decisions: Completing the Project Concept Note

3.1 Introduction

Project identification is formalised in the PCN which must be prepared for all public investment projects of €500.000 and more. Depending on the identification process which applies, the preparation of the PCN is expected to involve varying degrees of effort. For example, a project concept originating from an infrastructure master plan can be expected to be already well developed, whereas a project arising out of a stakeholder consultation is likely to require more effort to develop a workable concept. The template to be used for the PCN for projects with a capital cost of €5 m. and more is presented in Annex 1 to the Manual, whereas the PCN for projects of a capital cost of more than 0.5 and less than 5m. is presented in Annex 7 of the Manual. In summary, the PCN must provide information relating to the following aspects of the proposed project:

- Administrative information
- Project rationale and assessment of need
  - Intervention logic
  - Needs assessment
  - Project scope
- Strategic case for the project
- Preliminary economic case and analysis of alternatives

  - Project costs
  - Project benefits
  - Economic viability
- Budgetary impact and potential affordability
- Implementation arrangements
  - Possible procurement arrangements, including potential for PPP
  - Implementation arrangements and potential constraints
- Sustainability issues
  - Financial and institutional sustainability
  - Environmental and social sustainability
- Approach to further studies and consultations

The PCN should include information about the project based on internal analysis and reflection. It entails building consensus around the project and should involve both the relevant sector-specific technical expertise and specialised project analysts (from the officers responsible for the planning work related to public investment projects of the economic entity either at the level of the central Ministry or at the level of the Ministry's Department, depending on the relevant decision of each Ministry [9]). Building consensus on a project also involves consulting with relevant external stakeholders, as well as those within government, and this should be reflected in the preparation of the PCN.

During the course of preparing the PCN some project concepts may be dropped as it becomes clear that they do not meet the pre-selection criteria. It is, therefore, normal that some PCNs will be begun, but not completed. This should not be viewed as a waste of time and resources, but as a saving in terms of further project development costs. The PCN is intended to be an aid to early decision-making and should not be simply treated as an administrative task. The DG EPCD and MoF BD will expect the answers to questions listed in the template - which often require a 'yes' or 'no' response - to be supported by a concise argument and/or evidence. Absence of evidence will undermine the case for a submission.

In addition to new projects, a PCN must also be completed and submitted for projects that have been started but then stalled for an extended period of time due to shortage of funds. Similarly, a PCN must be prepared for projects that were developed, but not commenced, prior to the current reform of the PIM system.

Sections 3.2 to 3.9 provide guidance on completing the PCN

3.2 Administrative Information

Economic Entities must provide basic administrative information concerning the project, including the official project name - which must not be changed once a project is pre-selected - and the names of the officials responsible for implementation.

[9] For low capital intensive Ministries that have so far relied to the services of the Department of Public Works the same practice will continue to apply.

3.3 Project Rationale and Assessment of Need

3.3.1 Intervention logic

The PCN must explain the rationale for the reference project, as well as alternative approaches. The information requirements are:

- Description of the specific problem that the project is intended to address and its severity;
- Explanation of how the reference project would alleviate the identified problem;
- Description of alternative ways of addressing the problem, including policy measures.

The starting point for a project solution should be a clear identification of the problem that needs fixing and its severity. The problem should be defined in term of negative effects experienced by the economy or society. The effect and its cause(s) need to be clearly distinguished. In the water and sanitation sector the problem might be negative effects on human health or biodiversity resulting from uncontrolled wastewater discharges. In the roads sector the problem might be the high cost of access to markets for agricultural producers resulting from poor roads. An indication of the severity of the problem should be given and this should preferably be a quantitative measure (e.g., volumes of wastewater discharge; measures of bacteria or pollutants in water sources; road roughness; or average vehicle speeds). Project promoters are then required to explain (briefly) how the project will address the cause(s) of the identified problem.

Project promoters should consider alternative solutions[10], including solutions that do not require investment. For example, meeting increasing demand for water can be met by developing new water supplies, by fixing leaks in the existing distribution network or by metering consumption and raising tariffs to full cost recovery levels so as to constrain demand. In the road sector, urban road congestion might be tackled by investing in infrastructure or by better traffic management.

It is important to recognise the full range of alternatives at project identification while narrowing the list down for further study (see '*Economic Viability*' below). Identifying project alternatives may require research and consultation. The bigger the expenditure decision, the more worthwhile it is likely to be to invest in thinking through alternative solutions. In examining solutions, and when rejecting and selecting alternatives for further study, project promoters should take into account relevant findings from project completion reports and *ex post* evaluation studies from similar projects. These findings should be mentioned in the write-up where they have been influential in reaching decisions.

3.3.2 Needs Assessment

The PCN should identify target final beneficiaries (i.e., the end-users of the services provided by the project) and give an approximate assessment of their likely demand for the services provided by the project. The following specific information is required:

- Specific target group of final beneficiaries intended to benefit from this project;

[10] One important project alternative against which all others should be compared is doing nothing or, sometimes, doing the minimum necessary to maintain the status quo. This comparison is carried out formally in the feasibility study, but should also be considered at the project identification stage.

- Approximate estimate of how many end-users there will be for the services provided by the project, indicating the unit of measurement (e.g., individuals, households, businesses);
- Estimate of the physical demand for the services provided by the project on completion and its growth rate, indicating the unit(s) of measurement (e.g., cubic metres of water per day, vehicles per day); and
- Proposed physical capacity of the proposed facilities, indicating the unit(s) of measurement e.g., cubic metres of water per day, vehicles per day, or square metres of useable space.

When identifying target beneficiaries, the PCN should focus on the end-users of the services provided by the proposed facilities. Budget entities, implementing agencies (and their staff) and operating agencies (and their staff) are not the ultimate beneficiaries of public expenditure: target beneficiaries are members of the public, disadvantaged groups, specific communities or businesses.

For new project concepts, quantitative estimates of the number of users and their demand for services may be tentative at the concept stage and these will need to be refined at feasibility stage. It is nevertheless important to provide estimates, however preliminary, so as to provide a basis for making an initial assessment of the public worth of the project. For all quantitative estimates, the unit of measurement must be specified.

The PCN should also estimate the physical capacity of the proposed facilities. This should be expressed in the same unit of measurement as demand to allow comparison. This measure allows a preliminary assessment of whether the proposed supply of services is likely to be commensurate with the likely demand. This question provides an early check on whether the proposed facilities are being significantly under- or over-specified. This check should make allowance for growth in demand. Final confirmation of the required capacity is a subject for a feasibility study, if the project is pre-selected.

3.3.3 Project Scope

The scope of the project, its component parts and proposed activities, should be sufficiently wide to capture all the expenditure needed to deliver the project outputs and achieve the intended purpose. The PCN requires a description of the project and its components, supported by an explanation of how these represent a comprehensive solution.

During identification, project promoters will need to satisfy themselves that the scope of the project is appropriate and that critical components or activities have not been omitted. Examples of where this might be the case (and where the scope of the project would need to be extended) could be: road improvement projects that have inadequate connections to the rest of the network because of missing links (a bridge for instance); educational or health facilities with no access; or improvements to water distribution or sewerage networks without required improvements to water treatment or wastewater treatment plants.

3.4 Strategic Case for the Project

A critical component of the PCN and a core pre-selection criterion is the strategic case for the project. The PCN should demonstrate the project's relevance to the Government's strategic priorities and sector policies. This is a key requirement that must be fulfilled, because even if the project demonstrates a logical case for intervention and adequate demand it may still not be a strategic priority. To set the project in the broader context of government policy the following must be demonstrated in the PCN:

- Consistency of the project with the Government's strategic goals and its contribution to the goals and objectives of the economic entity; and
- Compatibility between the project and the timeframe for achieving the strategic goals and objectives that it is intended to serve.

The Government's goals are set out in the Statement of Government Strategy. Commitments to the EU must also be taken into account in determining policy relevance. Ministry goals and departmental objectives are set out in Ministry Strategic Plan Outlines. In line with the activity-based budgeting (ABB) approach, ministries carry out activities to achieve defined departmental objectives. Public investment projects deliver the new fixed assets required as inputs to these activities. This is how projects contribute to the achievement of ministry objectives. In demonstrating that a project is supportive of a ministry's goals and objectives, these linkages must be clearly established in the PCN. For major projects with a design and implementation period beyond the scope of a ministry's medium-term strategic objectives, the focus should be on demonstrating consistency with the longer term goals expressed in the Strategic Plan Outline.

3.5 Preliminary Economic Case and Analysis of Alternatives

3.5.1 Project Implementation Costs

The PCN should include indicative implementation cost estimates for the project and relevant alternatives. In principle, these estimates should include all implementation expenditures required to create a fixed asset capable of delivering the anticipated benefits to end-users. This means detailed design, land acquisition, construction, plant and equipment, and fixtures and fittings[11]. At pre-selection stage these are purely financial values and no attempt should made to make adjustments for opportunity costs (see Section 3.2, 'Performing Economic Analysis' for further explanation). In practice, it is recognised that a project concept stage there is no preliminary design so detailed item-by-item costing is not possible; however, notionally estimates should nevertheless encompass all the elements of capital costs required to achieve the project's purpose. Alternatives should include those that have been rejected because of high costs, as well as those that are considered worthy of further examination in the feasibility study. Estimated costs for project preparation (preliminary design, feasibility study, impact studies, etc.) should also be indicated, but separately. Where available, the unit cost of a similar completed project should be reported. The following information on costs must therefore be included in the PCN:

- Main components of expenditure for the project and for project alternatives mentioning any environmental mitigation measures that may prove necessary;
- Total estimated implementation costs [12](indicative only and in current prices) of the project and relevant alternatives, including the main technical variants of the reference project; and
- Basis for the cost estimates (e.g. construction cost per sq.m., estimates of the Department of Land and Surveys on the cost of land, etc)

[11] In the case of a hospital for example this would mean that all the medical equipment required for a functioning facility should be included in the cost estimates.
[12] Includes cost of studies and capital cost including equipment

It is critical that estimated costs for new project ideas be included in the project identification stage even though these are likely to have a high margin of error[13]. The most reasonable approach is to use indicative estimates based on unit rates for equivalent physical outputs, e.g., euro per km of road, euro per m^2 of floor-space in buildings differentiated by complexity of construction, etc. If it is reasonable to do so, given the approximate nature of cost estimation at this stage, allowance should be made for the cost of potential environmental mitigation measures where these could potentially make up a significant part of total costs. Otherwise, these cost components should at least be noted. For stalled projects, the estimated cost to complete (based on the updated contract price) is most relevant for the PCN and should be included. The basis for the cost estimates must be specified and will differ according to the stage of development.

Project alternatives can be divided into two types, alternative technical solutions for the identified problem and technical variants of a given solution. A technical variant may involve a change in the specification (a higher or lower design standard[14], for example, or changing the design life or acceptable level of reliability) or phasing of different components so that capacity increases more closely match growth in demand[15]. For example, different possible (horizontal) alignments for a road project should be considered as alternatives technical solutions (as would alternative solutions like improvements in traffic management, instead of investment in new infrastructure), whereas choices concerning the vertical alignment or the strength of the road pavement should be considered as variants. Technical variants are not expected to be analysed at pre-selection as cost estimates will almost certainly not be accurate enough, but potential variants can be highlighted for evaluation in a feasibility study (see Approaches to Further Studies below).

3.5.2 Project Benefits

At pre-selection stage it is important to identify potential benefits and make a preliminary qualitative assessment of their relative significance, though no quantification is expected at this stage[16]. The following information is required for the PCN:

- Main benefits to users of the assets that will be created;
- Any significant external benefits or negative effects for non-users[17]; and
- Any significant differences in benefits between alternatives, if any, with brief explanations.

Project benefits must relate closely to the problem identified earlier (in 'Intervention Logic') and the beneficiaries must be clearly identified. Even though services may not necessarily be paid for, users may still receive benefits, e.g., time and vehicle operating cost savings for road users or amenity

[13] For projects that pre-date PIM reforms where documentation has already been prepared, cost estimates will be available, but these must be adjusted to ensure that they are expressed in current prices.
[14] Low design standards often yield poor value for public money, perhaps because of higher operating and maintenance costs. The highest standard can also represent a poor value, because the incremental benefits do not warrant the additional cost. Extreme cases of over-designed projects are often referred to as 'gold-plated' solutions.
[15] Any delay in investment spending produces a real saving for the economy when costs are expressed in present value terms (i.e., discounted to the present day), even if there is no apparent saving when costs are presented in the undiscounted prices of a common base year. Such savings must be balanced against the additional fixed costs of phasing, e.g., mobilization costs at each phase.
[16] Stalled project or projects for which feasibility studies were completed before the PIM reforms may be exceptions.
[17] Positive and negative externalities are benefits and costs of the project that are not borne by the project implementer/operator and therefore not reflected in the project's financial accounts.

benefits for users of parks, and these should be highlighted. Benefits and costs that are external to the project operating entity, e.g., increases or decreases in noise nuisance or air pollution from transport projects, should also be highlighted. Social and environmental impact assessments may be required during preparation to assist in quantifying these externalities (see Approaches to Further Studies below). The PCN requires initial indications to be given of the likely approach to measuring benefits[18], i.e.:

- Estimation of monetary values for tangible benefits using market prices;
- Estimation of monetary values for intangible benefits/dis-benefits by simulating market prices;
- Quantification of impacts[19] for intangible benefits/dis-benefits where it is difficult to estimate monetary values; or
- Qualitative assessment of intangible benefits where it is difficult to quantify impacts.

There is no requirement to apply the suggested approach at this stage. The information does, however, help understand to what extent further studies are likely to be needed to improve decision-making.

3.5.3 Economic Viability

Consistent with the core pre-selection criteria specified in Article 84 of the FBRSL, the PCN should include a preliminary assessment of the economic viability[20] of the project, assessing whether it is likely to be a worthwhile use of public money. It will not be possible to come up with a definitive answer concerning the economic viability of a project before completion of a feasibility study involving cost benefit analysis (or cost effective analysis in cases where benefits are difficult to quantify). However, there are some unit cost indicators (see below) that project promoters and decision-makers should look at to decide if, on balance, the project has the potential to be a good use of public money and to rule out high cost/low demand projects (usually known as 'white elephants'). The PCN must therefore include the following information:

- Estimated capital cost per end-user and/or estimated capital cost per unit of demand for the final service derived by dividing capital costs estimates for alternatives (as discussed above in Section 3.5.1) by the estimated number of end-users or the estimated demand for services[21] (both if possible);
- Unit cost comparisons between alternatives and with other similar, recently completed projects
- Assessment of whether spending on the project is likely to represent a worthwhile use of public expenditure compared to alternatives (including doing nothing), given the available information on the balance between costs and potential benefits;

[18] Approaches to estimating different types of benefit are explored in more depth in Part III of the Manual.
[19] Quantified reductions or increases in environmental nuisance like noise of air pollution, for example.
[20] Throughout the Manual, the term 'economic viability' is used as shorthand for the viability of a project from the perspective of society as a whole: it does not mean narrow, financial profitability from the perspective of the operating entity or the state budget.
[21] These are crude indicators. A full analysis, i.e., as part of a feasibility study, must take account of the life-cycle costs of a project and its alternatives. However, looking at capital costs per end-user or per unit of output (service) provided to end-users can highlight demonstrably expensive project concepts that should proceed no further.

- Main risks and assumptions that could potentially affect the economic viability of the project and any risk mitigation measures that might be needed; and
- Project alternatives considered worthy of further study based on potential economic viability.

There is no expectation that project promoters will be able to come to a definitive conclusion concerning economic viability at pre-selection stage, but they should at least rule out projects that are evidently going to be too costly or where demand is insufficient, and rule in alternatives that are worthy of further consideration alongside the favoured reference project. In cases where a reference project is revealed to be a poor use of public funds during internal scrutiny, there is evidently no need to complete and submit the PCN to the Minister of Finance[22].

In coming to an overall conclusion on the likely economic viability of the project, promoters must take into account:

- The reasonableness of estimated capital costs per end-user and/or per unit of demand[23];
- The total number of beneficiaries and their make-up;
- The likely scale and nature of benefits;
- The balance between the proposed capacity of the facility and the demand for its services; and
- The extent to which the need to economise on public expenditure has been taken into consideration in the preliminary specification for the project design.

Where possible, a comparison of the cost per user or per unit of demand should be undertaken with other similar and recently completed projects. This comparison may be used to guide the decision on whether costs lie within an acceptable range.

Economic viability will be explored fully at feasibility stage (through cost benefit analysis where applicable) for those project alternatives giving clear indications of a good use of public money. The PCN should identify alternatives assessed as being worth further investigation on the basis of their potential to deliver high economic returns, as well as alternatives that have been rejected, briefly explaining the basis for these choices.

Important risks[24] or key assumptions that could affect the success of the project should be identified for all alternatives being considered. Findings from *ex post* evaluation of similar projects may provide insights into risks and should be noted in the PCN when relevant. This information will inform the approach to further studies (see below) where the impact of risks will need to be analysed more closely and the reliability of assumptions tested. If already foreseeable, risk mitigation measures should be raised in the PCN.

3.6 Budgetary Impact and Potential Affordability

Consistent with the core pre-selection criteria specified in Article 84 of the FBRSL, the PCN includes a preliminary assessment of the affordability of the proposed project. This begins by setting out the

[22] As established earlier, the preparation of the PCN is a process and not an administrative hurdle.
[23] It is therefore important to have provided quantitative information in response to the questions on 'Target Beneficiaries' and 'Estimated Costs'.
[24] The importance of a risk depends on the balance between the probability of it occurring and the impact it has if it does occur. High probability, high impact risks are the most important, whereas low probability, low impact risks are the least important.

budgetary impact of the reference project in financial terms and expressed in current prices. Budgetary impact includes both capital costs and operating and maintenance costs. In addition, any revenues earned directly from the project should also be reported.

The PCN should seek to demonstrate that there will be adequate fiscal space for implementing the project over the entire implementation period by comparing implementation costs to medium-term allocations and trends, ongoing commitments and projected spending on agreed new initiatives. Any funding gaps should be identified and proposals for filling them outlined.

According to the FRBSL, project promoters should include relevant provisions in the budget and in the MTBF [25]. Compatibility with MTBF ceilings will be the most important criteria for financially significant projects. For major projects [26], implementation will most likely commence outside the time-frame of the MTBF because of the time required for preparation activities. Implementation may also extend over a longer time period than is covered by the MTBF. In these cases, the inclusion of relevant provisions in the budget and in the MTBF will be done gradually depending on the stage of implementation of the project e.g. studies, construction works etc. Ministries should assess and prioritise their projects without risk of breaching the budgetary principles set out in Article 4 of the FRBSL[27], or in the Stability and Growth Pact.

Project promoters should discuss the affordability of a major project extending outside the MTBF period with the Ministry of Finance before submitting the PCN. The opinion issued by the Minister of Finance at the pre-selection stage is merely an opinion on the potential affordability of the project and does not represent a funding commitment.

3.7 Implementation Arrangements

3.7.1 Procurement: Traditional Procurement vs PPP

Pre-selection is too early to make even a preliminary decision about the preferred procurement method for the project, e.g., traditional infrastructure procurement vs public-private partnership (PPP); however, it will be important to highlight any characteristics that would suggest that PPP may be considered as a procurement option. These would include the potential for proper allocation of risk between public and private partners, or for private sector innovation in design solutions or operational practices. There should also be the possibility of formulating a long duration contract of sufficient size to outweigh the significant fixed costs of negotiating a PPP deal. Complex projects for which private entities can provide design and management solutions are good candidates for PPP procurement, as long as: (a) outputs and quality can be defined and monitored in a clear way; (b) user needs are stable over time; (c) the project is reasonably robust to policy changes; and (d) fast technological change is not expected to require significant changes in project design. It is not essential to identify the potential for using PPP at this stage - a project does not need to have been flagged as a potential PPP at Pre-Selection to be assessed for its suitability as a PPP at Appraisal - but it is facilitative. Further examination of the rationale for using PPP is undertaken as a final step[28] in the Appraisal stage for

[25] Years 2 and 3 of the MTBF. Year 1 is the budget year.
[26] These are likely to be significant and for the largest projects may even be greater than the threshold for 'financial significance' of euro 5.0 million or more.
[27] The principles concerned are sustainability, prudence and stability.
[28] Step 9A in the Appraisal stage set out in Part III of the Manual.

suitable projects which have been positively appraised, and new proposals for using PPP can be introduced at this time.

3.7.2 Implementation Arrangements and Potential Constraints

The PCN should include an initial description of implementation arrangements and an assessment of whether implementation could face any constraints or impact negatively on other projects. The PCN must include a brief overview of tentative project management and oversight arrangements, proving that the competent organisation possesses the necessary management/oversight capacity, not only with regard to its professional adequacy but also in terms of time availability taking into account the organisation's management/oversight programme. These do not have to be definitive or detailed, but there needs to be evidence that the arrangements for delivering the project on time, to budget and within specification have been considered at an early stage. This section of the PCN may be informed by relevant findings from any project completion reports for similar projects. The following information must be included in the PCN:

- Proposed arrangements for overseeing and/or managing project implementation[29];
- Adequacy of human resources for implementing projects of the scale and nature of the proposed project and additional measures that may be required to ensure sufficient capability;
- Potential negative consequences for the implementation of the project from other ongoing projects in the sector (because managerial capacity will be spread too thinly) and how these might be dealt with; and
- Possible constraints that will need to be overcome or additional measures to be put in place before the project can be successfully implemented.

The PCN should demonstrate concise evidence on the project leadership and capacities of supporting staff from the organization ultimately responsible for project implementation e.g., staff numbers, qualifications and experience. Even in cases where projects may outsource the day-to-day project management and supervision, the PCN should nevertheless consider the high-level leadership capability for overseeing and interacting with external project managers and supervising consultants and for performing necessary high-level management functions. Some summary information on the ongoing and planned project portfolio should also be supplied to demonstrate that implementation of the proposed project can be absorbed within existing capabilities.

In addition to resources, the PCN should outline other potential implementation constraints and additional measures that can be identified at this early stage. These could include issues such as land purchase, population resettlement or environmental safeguards. Additional measures such as legal or regulatory changes required to make the project effective should also be identified. An indicative timeframe for implementation of any additional measures should also be provided.

3.8 Sustainability Issues

Delivering sustainable benefits for end-users requires more than capital investment alone. It also requires that the organization responsible for operating and maintaining the facility has sufficient managerial and financial capacity to ensure the efficient utilization of the capital asset created. This

[29] One option is to outsource day-to-day project management and supervision; however, if this is the case the project proposers must indicate the internal, counterpart arrangements for overseeing and interacting with external project managers and supervising consultants, so that they are 'smart clients'.

section of the PCN should demonstrate initial plans for operational sustainability, in particular in relation to affordable funding for sustainable operations and maintenance. Affordability considerations may include budget financing or user charges. If users are to be charged for the provision of services, there needs to be some preliminary evidence presented to show that they will be willing and able to bear these charges and whether these charges are likely to be sufficient to cover operating, maintenance and depreciation costs. If funding from the budget is expected, the affordability of this should be considered in relation to trends in current budgetary allocations and other competing claims.

The PCN should include information on these issues in order to allow an early assessment of whether the proposed capital expenditure makes sense in the current operating environment, or whether its effectiveness is likely to be compromised by inadequate preconditions. The PCN must include the following information:

- Organisation(s) that will own and operate the asset created by the project, including whether it maintains an up-to-date asset register;
- Adequacy of the technical, managerial and financial capacity within the organisation responsible for operating and maintaining the capital asset once completed and any measures required to create the necessary capabilities; and
- Coverage of operating, maintenance and depreciation expenses once the project is completed, including the sustainability of user charging.

Environmental and social sustainability should be considered as part of the PCN. Full impact studies are not expected at this stage (see Section 3.9 below), but the main areas of concern should be identified, along with any critical impacts that could potentially jeopardise the long-term success of the project. Where critical impacts are foreseen possible mitigation measures should be identified.

3.9 Approach to Further Studies and Consultations

The pre-selection decision is a decision to commit funding for further studies. The PCN therefore concludes by outlining the approach to these further studies and their expected cost. On the basis of this section of the PCN and the preceding analysis, it should be possible to draw up coherent terms of reference for the feasibility study that will be at the centre of Project Appraisal, the next stage of the project cycle.

This part of the PCN should begin by presenting the shortlist of project alternatives and summarising the underlying rationale, including the rationale for the reference project proposal[30]. To be shortlisted an alternative should compare favourably with the project proposal in terms of potential economic viability, risk, affordability, implementation requirements and operational sustainability. A brief rationale for any alternatives that might have been ruled should also be included at this stage. These reasons could include higher costs and/or lower benefits than the proposed project, significantly higher risk, demanding implementation requirements or doubts about operational sustainability. Specific issues relating to economic viability that will need to be addressed in more depth at feasibility stage should also be identified in the PCN. These could include project alternatives to be

[30] This will not necessarily be the same as the findings from economic viability, as other factors like affordability and operational sustainability will have to be taken into account.

examined, the choice of technology for the project or the approach to valuation of non-market costs and/or benefits.

The PCN should include an outline of the approach to further studies and consultations that will be required should the project go on to the appraisal stage. The following information is required:

- Shortlist of project alternatives intended to be taken forward to the appraisal stage as a result of the pre-selection analysis, together with alternatives that have been dropped and the reasons for doing so;
- Further studies required before the appraisal decision can be taken;
- Estimated cost of further studies;
- Any consultations, either formal or informal, required to support studies and appraisal decisions;
- Any specific issues that must be given special attention during further studies, including those indicated in findings from *ex post* evaluation of similar projects;
- Any requirement for a pre-feasibility study;
- Requirements for a social impact assessment and main areas of focus; and
- Legal requirement for an environmental impact assessment to be performed and reasons, if any, for going beyond these minimum requirements.

For financially significant projects, further studies should include preparation of a feasibility study, involving economic analysis. In addition to this, specific demand studies to assist in valuing non-market costs and benefits may also be required in support of the feasibility study. Depending on the operational sustainability of the project, which may require establishing new user charges or increasing old ones, specific studies to evaluate users' willingness and ability to pay and to develop revenue forecasts may be required. Technical design studies - preliminary at the feasibility study stage and more detailed after an appraisal decision has been made - will be necessary. Any specific design issues that will require special attention should be also flagged in the PCN. Where possible, the approach to further studies should be informed by relevant findings from *ex post* evaluation or project completion reports.

For large, complex or innovative projects, a pre-feasibility study is sometimes undertaken to determine whether it is worth spending money on an, often very expensive, feasibility study. The pre-feasibility study will often determine the preferred project alternative, although some of the other alternatives will usually also be included in the feasibility study (while the least attractive may be rejected at pre-feasibility stage). A pre-feasibility study is not an obligatory step in the project cycle for financially significant projects, but may be used by project promoters to improve decision-making and refine the scope of a feasibility study[31]. The Minister of Finance reserves the right to request a pre-feasibility study. Such a request will form part of the pre-selection opinion.

The PCN must highlight any requirements for a social impact assessment or an environmental impact assessment. It is important to ensure that the minimum legal requirements for environmental impact

[31] It would be unusual to carry out a pre-feasibility study for a non-financially significant project, for which full feasibility studies are not a requirement.

assessment are identified and that these will be satisfied in further studies. There may, however, be reasons for going beyond these minimum requirements if certain environmental impacts, both negative and positive, are considered to be critical to understanding the public worth of the project. These cases will have been identified in the section of the PCN dealing with the identification and valuation of benefits. It will be important to foresee the studies required to assess the scale of any significant environmental impacts so that these can be captured in the economic analysis required at project appraisal stage.

If PPP has been flagged as a potential procurement modality, it will be important to note requirements for PPP value for money studies. The timing of these studies in relation to other appraisal studies should also be indicated so that they are planned to be available at the right time to inform the decision-making process.

4. Key Review Criteria for Pre-selection of Projects

To obtain a positive pre-selection opinion a project must meet all of the criteria listed below. Reviewers should apply judgement in deciding whether the criteria have been met on the basis of the information supplied in the completed PCN. Before submitting the PCN to the DG EPCD, Economic Entities should first carry out their own internal review to be satisfied that the project meets the criteria. The DG EPCD and MoF BD may, for their respective areas of assessment, if necessary, hold technical discussions with the project promoters to understand better the project and clarify the PCN.

To be pre-selected a project must satisfy the criteria set out in Table 1. These will be assessed on the basis of the information provided in the PCN and all criteria must be assessed positively. Since the information and analytical bases are not well developed at this stage, exercise of judgement is required in determining whether the criteria have been met. The yes/no answer must therefore be arrived at on the basis of a qualitative assessment of the balance of probabilities. It should be remembered that, at this stage, the intention is not to identify the best projects, but to rule out the worst projects, i.e., the obvious white elephants .

Table 1: Core Pre-Selection Criteria[32]

Dimensions/Judgement Criteria	**Yes**	**No**
A. General		
1. The information provided in the PCN is adequate to arrive at a pre-selection opinion.		
2. It is clear which organisation is implementing the project and who will ultimately be responsible for delivering the project on time and to budget.		
B. Project Rationale and Assessment of Need		
3. The problem or opportunity to be addressed is clearly demonstrated and the way in which the project will help solve the problem or respond to the opportunity is explained and makes sense.		
4. The description of the scope of the project is sufficiently detailed for pre-selection stage and there are no obvious omissions of major components that could potentially jeopardize the achievement of the project purpose.		
5. There is an urgent need, i.e., within the next 3 years, for the services of the project as demonstrated by evidence of one or more of the following: • existing demand for a facility close to the end of its economic life or technologically obsolescent; • a severe capacity constraint in existing facilities resulting in suppressed demand; • strongly growing demand, likely to outstrip the capacity of existing facilities in the near future; or • demand for new services not previously provided.		
C. Strategic Case for the Project		
6. The project will contribute to the achievement of relevant strategic goals and objectives as set out in approved national or ministry strategic plans or other such documents.		
D. Preliminary Economic Case and Analysis of Alternatives		
7. The proposed technical solution is appropriate to the problem identified, i.e., the envisaged technology is neither too advanced nor over-specified.		
8. The postulated project benefits are plausible and the target beneficiaries represent a priority for government.		

[32] It is noted that while all of the sections/questions included in the Table are relevant and have to be looked at, DG EPCD and MoF BD will focus mostly on questions under D and E when undertaking there assessments since these are the most relevant for the viability and the affordability assessment, respectively. Questions under C will not constitute a factor to reject a project at this stage and will be discussed between MoF BD and Ministries in the context of the strategic planning and budget process.

Dimensions/Judgement Criteria	**Yes**	**No**
9. Benefits to users are likely to be achievable at an acceptable cost, for example, approximate capital costs per user or per unit of output are in line with comparable projects and/or international experience.		
10. On balance, there is good reason to believe that the proposed project costs are likely to be exceeded by the potential benefits.		
11. Alternative solutions have been considered and the more promising among them have been identified for inclusion in subsequent in-depth analysis for appraisal.		
E. Fiscal and Financial Sustainability		
12. The medium- to long-term budgetary impact of the project is not inconsistent with budgetary projections and trends, taking into account the existing commitments of the economic entity proposing the project.		
13. If the project is to be implemented and operated by a self-financing economic entity, its financial overall position - cash flow and solvency - is sound and likely to remain so.		
F. Implementation Arrangements		
14. The responsible implementing agency appears to have the necessary capacity to deliver the project or is very likely to be able to make good any non-critical weaknesses before implementation begins.		
G. Sustainability Issues		
15. The sustainability of the project is not likely to be compromised: • By a shortage of funding for operations and/or maintenance; or • By critical weaknesses in the capacities of the operating entity which are unlikely to be resolved in time for project completion.		
16. Mitigation measures can be foreseen for any potentially critical environmental or social impacts.		
H. Approach to Further Studies		
17. Suitably comprehensive requirements for further studies, including social and environmental impact assessments where necessary, have been presented.		

Part III: Project Appraisal - A Step-by-Step Methodology

1. Introduction and Overview

Project Appraisal aims to answer the following overarching questions[33] concerning a project proposal:

- What is the objective of the proposed project?
- Are there no better ways to achieve the objective than the proposed project?
- Are there no better uses for the resources that will be employed?

Without answers to these questions a project should not be allowed to proceed further. Part III of the Manual explains the Project Appraisal process and methods that can be used to arrive at answers to these questions. For financially significant projects, the process can be divided into 9 steps as follows:

Step 1: Define the project objectives and scope

Step 2: Identify and choose project alternatives for appraisal

Step 3: Demonstrate the demand for the services of the project and alternatives

Step 4: Identify relevant benefits and costs

Step 5: Value economic benefits and costs

Step 6: Calculate net present values for project alternatives

Step 7: Analyse risks and plan for their management

Step 8: Assess affordability and sustainability

Step 9: Identify the preferred project alternative and make recommendations to decision-makers

These steps cover the sequenced analytical work leading to an informed decision on the economic and social worth of a capital investment project and its long-run sustainability. Balanced and consistent decision-making depends on their systematic application in the project appraisal process. The main technical output underpinning the appraisal process is the feasibility study and, although the detailed content and any supporting studies may be project or sector specific, the overall analytical framework for the feasibility study should reflect the steps outlined above. In defining the scope of a feasibility study and when reviewing it on completion, the responsible economic entity should ensure that the steps are indeed reflected therein. The DG EPCD will also check that the feasibility study reflects the appraisal steps when undertaking its independent review. To aid the preparation of a feasibility study, a model template is presented as Annex 5 to the Manual.

Section 3 below explains how to perform each of the 9 steps. While the aim in defining these 9 steps is to ensure a systematic and sequential process, some iteration between certain steps may be required. For example, weaknesses uncovered at any of Steps 5-8 could lead to a review of project alternatives (Step 2) with a view to reducing costs or increasing benefits. This in turn would require returning to the subsequent steps. Some flexibility is therefore required in applying the steps.

Economic cost-benefit analysis (CBA)[34] is the default tool at the heart of the project appraisal methodology set out in this Manual. CBA consists of quantifying in monetary terms all the costs and

[33] These are similar to the question posed at the beginning of the UK's Green Book and New Zealand's Cost Benefit Analysis Primer – see Part I for references.

benefits of a project to society and, by discounting, determining the net benefits (or costs) in terms of a present value. Net benefits/costs so expressed can be used to choose between a given project proposal and alternatives, including the alternative of doing nothing.

While every reasonable effort should be made to apply CBA to financially significant projects, depending on the nature of project benefits and costs, it may have to be supplemented or replaced by other tools. When there are additional significant benefits or costs that cannot be valued, qualitative means of assessing these have to be used. These may take the form of a qualitative judgement that the additional benefits will be more than enough for the project to be economically viable, in the case where there is strong and credible evidence to this effect, or the use of more systematic qualitative tools, like multi-criteria analysis (see below), where this is less obviously the case. If it is not feasible to value project benefits at all, then cost-effectiveness analysis, possibly supplemented by a multi-criteria analysis scoring system, is used. These situations are discussed in more detail later in this part of the Manual.

Although economic cost-benefit analysis is performed using monetary values it is not the same as a financial cost-benefit analysis. Table 2 summarises the differences. The terminology used in the table will be explained elsewhere in Part III. The important thing to note is that economic analysis looks at the project from the perspective of society as a whole, whereas financial analysis looks at the project from the narrower perspective of the operating entity. This results in differences in the factors included/excluded in the analyses and in the approaches to valuation. Although economic cost-benefit analysis is the core tool for project appraisal, financial analysis will also have to be performed to assess the financial sustainability and profitability of revenue generating projects (this is dealt with in Step 8).

Table 2: Major Differences between Financial and Economic Cost-Benefit Analysis

	Financial Analysis	**Economic Analysis**
Perspective	Agency/organisation/firm	Economy/society
Objective	Analysis of the net financial impact of the proposal on the agency	Maximising the social returns to the economy's resources
Pricing	Market prices	Opportunity costs/shadow prices
Transfer payments (taxes & subsidies)	Included	Excluded
Equity/distributional effects	Excluded	Can be included, usually treated qualitatively
Externalities	Excluded	Included
Depreciation	Excluded (from discounted cash flow analysis, but included in financial statements.	Excluded

[34] Also sometimes referred to as social cost-benefit analysis.

The appraisal of projects is not limited to a quantified economic cost-benefit analysis. There may be benefits and costs that cannot be readily valued. Often these will relate to environmental impacts. Decision-makers are also interested in where in society the benefits and costs fall and whether this is fair. Environmental and social impact assessments may be required alongside economic studies and these are also considered below (under Step 8 in Section 3.3).

In line with recommended good practice,[35] an integrated approach to the treatment of potential public-private partnership (PPP) projects has been adopted. This means that there is no parallel track for PPP projects and they must follow the appraisal methodology (outlined below), as for any other financially significant project[36]. As with any public investment project, the economic and social worth of a potential PPP project must be demonstrated using economic cost-benefit analysis and/or other appropriate tools as explained in the rest of Part III[37]. The investigation of advantages/disadvantages of using PPP procurement can commence only after the project has been appraised and its strategic importance, feasibility and sustainability been confirmed. Part IV describes the methodology for proceeding with evaluating a potential PPP project.

A simplified analytical and decision-making approach applies for non-financially significant projects. This is described in detail in Section 3.4 below.

[35] See pages 10-12 of 'The Power of Public Investment Management: Transforming Resources into Assets for Growth', World Bank, 2014

[36] As required by Article 83 (2) of the FRBSL, all PPP projects are treated as financially significant.

[37] This is in line with Article 86 (5) of the FRBSL which requires PPP projects to provide 'economic returns in terms of the economic, social and environmental criteria, as determined by the Minister' [of Finance] before being included in the budget.

2. Roles and Responsibilities

Consistent with the FRBSL, the roles and responsibilities at the project appraisal stage for financially significant projects are defined in the Public Investment Management Guidelines as follows:

Stage 2.2	Proposer	Evaluator	Reviewer	Decision Maker
Project Appraisal	Economic Entities	Economic Entities (could be also through contracting out)	DG EPCD for viability Budget Directorate for affordability	Minister of Finance

The project appraisal stage covers both feasibility-level project preparation, i.e., the design and analytical work required to assess the economic viability and sustainability of a project, and the evaluation and decision-making that follow. In more detail, the roles and responsibilities summarised above are as follows:

- Contingent on a positive pre-selection decision, the responsible economic entity proposes a project for appraisal either on its own behalf or on behalf of a subordinated agency.
- The economic entity promoting the project organises the preparation of a feasibility study, together with preliminary design work and other supporting studies. e.g., environmental and/or social impact studies. Depending on the scale and complexity of the project and on the expertise required, this work may be carried out in-house or contracted out.
- On the basis of this preparatory work, the economic viability and sustainability of the project is evaluated by the economic entity. Where preparatory work has been performed by contracted consultants, the economic entity should validate this work and the evaluation findings and reach a conclusion on whether to proceed further. A draft Project Appraisal Report should then be prepared by the economic entity (and not the consultants), including recommendations on the preferred project alternative.
- The evaluation findings and conclusion should then be reviewed in-house by the relevant economic entity. This review should be carried out by officials with no connection with the project so as to minimise conflict of interest and the risk of optimism bias[38].
- The senior management of the economic entity are then responsible for making a final appraisal decision on the worth of the project. This involves approving a final version of the Project Appraisal Report, incorporating any changes resulting from the in-house review.
- Project Appraisal Reports for project with a positive appraisal decision should then be submitted by the relevant economic entity to the DG EPCD and Ministry of Finance (Budget Directorate), together with supporting design work and studies. The DG

[38]The systematic tendency for project planners to under-estimate costs and over-estimate benefits.

EPCD then carries out an assessment of project viability and the MoF BD assesses the affordability of the project based on the Project Appraisal Report.

- On the basis of the findings and recommendations of the review and taking into consideration any resulting revisions to the Project Appraisal Report, the Minister of Finance is then responsible for making a final decision on whether a project is deemed viable and affordable and thus eligible for being proposed for inclusion in the budget. The Minister of Finance submits a list of projects that passed the viability and affordability assessment to the Council of Ministers for information purposes.

3. Steps in Project Appraisal

3.1 Establishing the Project Context

Much of the work involved in establishing the context for the project should have been carried out when preparing the Project Concept Note (PCN) for the Pre-Selection decision. As part of Step 1 to 3 of the project appraisal, the information and analysis in the PCN should be reviewed, updated and deepened. If the context for the project has worsened significantly since the project was pre-selected, the project appraisal should not proceed further, and either the project should be abandoned or a revised PCN should be submitted for a Pre-Selection decision. Whatever the case, it is a requirement that the project promoters discuss with the DG EPCD any substantive changes that are revealed during their review of the project context, before launching project appraisal.

The project concept taken forward to project appraisal should not differ substantively from the project concept which was approved at Pre-Selection. This is something that the DG EPCD will check very carefully. The DG EPCD will check that the rationale for the project and the expected demand are in line with what was in the PCN and the Budget Directorate will check that the costs are broadly in line with what was assessed as affordable. Significant departures from the PCN, which have not been cleared with the DG EPCD beforehand, will normally require projects to return to the Pre-Selection stage whatever the state of advancement of project appraisal. Project promoters should therefore submit a formal request to the DG EPCD as soon as possible after a change is foreseen and obtain written approval for the change following bilateral discussions.

Step 1: Define the Project Objectives and Scope

Define the problem and the intervention logic

The problem to be addressed, the rationale behind the proposed project and the case of public sector intervention will already have been presented in the PCN. Project promoters should begin the Project Appraisal process by and then reviewing the intervention logic as set out in the approved PCN. This review will involve:

- Verifying the description of the specific problem or opportunity that the project is intended to address and ensuring that it is still accurate and that the problem is still relevant and severe enough to warrant an urgent intervention.
- Confirming the broad explanation - cause and effect logic - of how the project is expected to alleviate the identified problem or respond to the opportunity and further deepening this explanation where necessary.

- Checking that the justification for government intervention based on market failure or equity concerns remains valid (although it is unlikely that an unsuitable project would have got this far)[39].

Present the project in the context of national development strategy and ministry strategic plans

The strategic relevance of the project is a central component of the PCN and a core criterion for the Pre-Selection decision. It will be important to verify the continued strategic relevance of the project to take account of any changes of policy direction that may have occurred at Government or Ministry level. Project promoters should therefore review the strategic case for the project as set out in the approved PCN. They should reconfirm that the strategic case is well made and that the project will:

- Support the Government's goals as set out in the Statement of Government Strategy;
- Support the Ministry's goals as set out in the Strategic Plan Outlines; and
- Contribute to the achievement of the Ministry's objectives as set out in the Strategic Plan Outlines.

Define objectives for the project and identify constraints

Once the problem and rationale for government intervention are justified, it is important to have a clear statement of the objectives of the project so that appropriate alternatives for achieving these can be considered in Step 2. A key aspect of project appraisal is testing the "reference" project against alternative ways of achieving the same objective. The hierarchy of objectives for the project should be defined as follows[40]:

- Overall Objective: General objectives such as income increases, standard of living improvement, poverty reduction, natural resources protection etc. to which the purpose is going to contribute.
- Project Purpose[41]: The project's central objective expressed in terms of the achievement of sustainable benefits for the target group.
- Project Outputs: Achievements created by the project, which produce the services or facilities corresponding to the project purpose.

The objectives above should be described using SMART[42] terminology so that they are monitor-able and it is possible to know when they have been achieved. These theoretical definitions are best illustrated by the example given in Table 3 which gives the hierarchy of objectives for a road construction project. In this example, the project has as its overall objective increased economic activity. The precise contribution of the project to the overall objective is difficult to gauge, because there will be many other influences.

It is at the level of the project purpose that alternative approaches can be identified. In the example given in Table 3, for example, the construction of a new road is not the only way of reducing travel costs and improving safety. There are other ways of achieving the project's purposes such as

[39] An equivalent approach is to consider what would happen of the government were not to intervene.

[40] These definitions correspond to those used in the logical framework approach, a project planning management and monitoring tool used by many governments, development agencies and business organizations, and particularly favored by the European Commission for EU funded financial assistance.

[41] Generally there should be only one purpose: if there is more than one purpose, it is recommended to review, and perhaps adjust, the focus of the project.

[42] Specific, Measureable, Achievable, Relevant, and Time-bound.

improved traffic management, congestion charging and installation of speed cameras. Some of these alternatives will not need capital investment.

The project outputs[43] are the things that will need to be delivered to achieve the purpose. The output in Table 3 is for the reference alternative of road construction project and is expressed in terms of km o road constructed. Alternatives to road construction would have different outputs. These might be completely different outputs from the reference project for radical alternatives to road construction or not dissimilar for alternative routes. The project manager and, in the case of a construction project, the contractor are held accountable for delivering the outputs.

As well as assisting in defining project alternatives a good specification of objectives is essential for monitoring the project during implementation and for evaluating its performance on completion. The indicators in Table 3 would be the basis for monitoring and evaluation of this particular project.

Important potential constraints which might affect implementation of the project and achievement of its objectives should be identified at this stage. These may be technical, legal, financial or political in nature, or they may have to do with timing or location.

Define the project scope

The scope of the project will have been defined in broad terms in the PCN. For appraisal, the scope described in the PCN must be reviewed and given more detail. This involves setting out all the project outputs, i.e., what will be delivered by the project upon completion, and the main activities required to accomplish these outputs. The intention should be to demonstrate that all the necessary activities have been captured and that the planned outputs are sufficient to achieve the purpose of the project, i.e., sustainable benefits for the target group.

The main outputs will be fixed assets (tangible or intangible), but supporting outputs such as trained staff may also be required to ensure that benefits can be achieved as planned. These outputs should also be included in the project scope. For analytical purposes, the project boundary should extend to all activities and outputs necessary to deliver the intended benefits, even if these come under the responsibility of another economic entity. Access roads, utility connections or staff training provided by another economic entity would be examples of project components that should be included, even if the costs do not fall upon the economic entity promoting the project.

Ultimately, the definition of the project scope should be sufficient to reach a conclusion on whether the project represents a sufficiently comprehensive answer to the issue/problem identified as requiring a solution.

[43] Project outputs differ from budgetary outputs, which are the public services delivered by the government. Budgetary outputs usually align more closely with the project purpose.

Table 3: Example of Objectives for a Road Construction Project

Designation	Description	Indicators
Overall objectives - in terms of project impact	**Increased socio-economic activity**	- **New activity/New jobs** - **Net Job creation** - **Increased regional GDP per capita**
Project Purpose - in terms of sustainable benefits for the target group	**Reduced journey time and transport costs** **Increased safety** **Increased flows: persons and goods**	- **Accessibility** [1] - **Time savings (in minutes/hours)** - **Cost savings (%)** - **Nr. of acidents** **Level of traffic flows**
Results - in terms of project outputs	**Construction of a road**	- **Implementation:** **Physical: km constructed**

Step 2: Identify and Choose Project Alternatives for Appraisal

The project appraisal involves comparing life-cycle costs and benefits of the reference project and feasible project alternatives. Project promoters should refine the alternatives, including technical variants of the reference project, which have been shortlisted in the pre-selection stage and should consider introducing any realistic new alternatives that may have been overlooked at Pre-Selection. This stage still should maintain a degree of flexibility in terms of introducing alternative comparators against which to test the preferred project.

Project alternatives may include measures other than expenditure on new public sector capital assets and direct public provision of services, such as improved regulatory control or subsidies to private sector service providers. Some examples of alternatives that may be considered are:

- Using different technological approaches or different technologies;
- Varying the timing, phasing and scale of a capital investment;
- Renting, building or purchasing facilities;
- Refurbishing existing public facilities instead of building new;
- Changing the balance between capital and recurrent expenditure, such as by choosing between more or less capital intensive service provision;
- Sharing facilities with other agencies;
- Changing locations or sites; and
- Improved implementation of existing measures or initiatives instead of investing.

When defining alternative interventions, a 'business-as usual' alternative must always be defined, against which the reference project and the short-listed alternatives will be compared. The business as usual alternative should generally be equated to doing nothing (the 'do-nothing' alternative) unless this is extremely unrealistic, in which case a 'do-minimum' alternative may be defined[44]. If a 'do-minimum' alternative is being considered, this should be discussed with DG EPCD to verify the realism of the assumptions.

An analysis period must be decided upon, over which the benefits and costs of the reference project and those of its alternatives will be assessed. The analysis period should normally correspond to the useful life of the fixed asset created and should be the same for all alternatives. In reality some major infrastructure assets have almost indefinite lives, providing a programme of planned routine and periodic maintenance is pursued. It has been common practice internationally to curtail the analysis period and include a residual value[45] as a benefit in the final year of the chosen analysis; however, this can potentially be a crude approach, depending on the extent to which future values are discounted. Table 4 presents the reference analysis periods by sector recommended by the European Commission.

[44] This would represent the minimum level of expenditure required to maintain the status quo or avoid an unacceptable deterioration in public services over the life-cycle of the proposed project.

[45] Reflecting the remaining service potential of a fixed asset that has not yet come to the end of its economic life.

Table 4: Reference Analysis Periods for Project by Sector

Sector	Years
Railways	30
Roads	25-30
Ports and airport	25
Urban transport	25-30
Water supply & sanitation	30
Waste management	25-30
Buildings	20
Energy	15-25
Broadband	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', DG for Regional and Urban Policy, European Commission, 2014

The longest analysis period in Table 4 is 30 years, with reduced periods specified for short-lived assets. Commission guidance is to apply a residual value for assets with useful lives exceeding 30 years. In keeping with the approach adopted in a number of good practice countries, the recommended approach in this Manual is to place less weight on residual values and use an analysis period more closely reflecting the useful life of a long-lived asset. The analysis period for major infrastructure projects involving a large share of civil works, roads and ports for example, may therefore be extended beyond 30 years to as much as 60 years. Projects with significant environmental benefits and costs which extend across generations may have even longer analysis periods.

In the steps that follow, some flexibility with respect to the depth of analysis of project alternatives is required. A feasibility study will require completion of a preliminary design for the reference project and estimation of implementation costs on the basis of this design. A feasibility study would also be expected to include sensible technical variants of the reference project designed and costed to the same level of detail. Other project alternatives are not generally expected to be designed and costed to the same level of detail as the reference project and its technical variants, unless there are clear indications that the appraisal decision is finely balanced. In the absence of such indications, the costs of other project alternatives may be estimated using more approximate methods based on an outline design or other equivalent approach. Similar considerations apply for the estimation of benefits, where these are likely to vary between alternatives. The depth of analysis required should be specified in the terms of reference for the feasibility study[46].

Step 3: Demonstrate the Demand for the Services of the Project and Alternatives

The PCN will have identified the target beneficiaries and given indicative estimates of demand for the services of the project. The latter will not, however, be adequate for project appraisal, for which more

[46] When planning and budgeting for feasibility studies, Economic Entities may wish to consider including a contingency for deeper analysis of alternatives that prove more promising than expected. In the absence of such a contingency, a new feasibility study may be required for an alternative that proves to be more promising than the reference project. Such a requirement, if it emerges, will never be considered as a planning failure, but as an indication of a successful and adaptable planning process aimed at ensuring the efficiency and effectiveness of public capital investment.

reliable forecasts of demand must be developed. Rigorous demand analysis is at the heart of a good project appraisal and is essential for:

- Designing appropriately sized capital assets with the necessary capacity for current and future users;
- Making reliable cost estimates;
- Estimating the benefits of the project accurately; and
- Arriving at a robust conclusion on the economic viability of the project.

As part of the project appraisal, project promoters must develop a quantified forecast of the expected demand for the defined services of the project, including the expected growth in this demand over the lifetime of the project. Depending on the nature of the project, these forecasts may cover things such as school enrolment, hospital caseloads, road traffic, water consumption and solid waste generation.

Demand is influenced by a variety of factors which, depending on their relevance, may need to be taken into account when making forecasts. These include:

- Background economic growth;
- Income changes among potential target users;
- Demographic change - natural growth or decline in the population and of different cohorts within it; migration into or out of the project area;
- New industrial, business or agricultural developments coming on stream in the project area;
- The cost of the services provided - even if free, there may be costs involved in accessing services;
- Long term technological change and changes in public preferences.

The level of detail in demand forecasts may vary depending on the scale of the project and the extent to which it is innovative. For major or highly innovative projects, demand analysis is expected to be very detailed, involving collection of primary data through surveys and the use of econometric analysis and, where applicable, modelling techniques. For straightforward and lower value projects, the approach can be simpler, based on intelligent trend analysis. Simply extrapolating current trends without question is not, however, acceptable[47]. Trends must be examined critically to ensure that there will be no significant shifts in the underlying factors over the life of the project. Whatever approach is used for projecting demand, it is important to present historical evidence of previous trends, where this exists, to put forecast in context.

Due to differences in the underlying drivers of demand, more accurate forecasts will be obtained by projecting demand for different groups of users separately (and then combining them), rather than developing aggregate forecasts. For example, differences in the growth in demand for business and leisure travel or for water depending on type of user (industrial, business, institutional or residential).

Demand forecasts should, to the extent possible, distinguish normal growth and growth due to a reduction in the effective cost of a service, which is known as generated demand. This distinction is important because benefits to generated demand are treated differently (see Valuation of Economic Benefits).

Over-optimistic forecasts of demand are a worldwide cause of poor public investment decisions. This systematic phenomenon, referred to as optimism bias[48], should be guarded against wherever possible.

[47] This has been a frequent cause of over- or under-investment in many countries.
[48] Under-estimation of project costs is the other dimension of optimism bias.

It is therefore advisable to subject demand forecasts to independent external scrutiny, especially for major projects.

3.2 Performing Economic Analysis

Step 4: Identify Relevant and Material Benefits and Costs

Introduction

Economic cost-benefit analysis should consider all benefits and costs for society as a whole, pecuniary or otherwise, no matter where they fall and should extend beyond the narrow perspective of the impact on the accounts of an individual operating entity. Benefits and costs should be relevant and material to the economic analysis. Relevance means that they can clearly be traced back as an effect of the project, i.e., they would not have occurred without it, and that they are incurred by parties of interest for decision-making. To be material, their impact on the analysis must be significant enough to be likely to influence the final choice from the shortlist of alternatives being considered. Relevant and material benefits and costs should have been identified for the pre-selection decision and recorded in the PCN. This should not, however, be taken for granted and this dimension of the PCN should be scrutinised carefully at the project appraisal stage to ensure that no relevant and material benefits or costs have been excluded.

A national perspective on benefits and costs should generally be adopted, whereby only benefits and costs to residents of the Republic of Cyprus are accounted for. In certain circumstances, however, wider regional or international effects may need to be taken into account. Examples where a wider perspective might be considered include major transport or energy projects with important impacts on near-neighbours or with significant global environmental effects, such as changes in carbon emissions.

Relevant Economic Benefits

An economic benefit is any increase in the welfare of society or the individuals who make up society brought about by the proposed project[49]. This means that gains to government and to the non-government sector (private business, voluntary and community sectors) are included, as well as those to private individuals. Benefits from public action will mostly accrue to private individuals.

It may be possible to value the economic benefits of some projects directly using market prices. These are usually referred to as the tangible benefits. It may not be possible to value some benefits (and some costs) for public sector activities directly using market prices as these may not be observable[50]. These benefits are usually referred to as intangibles. For some intangible benefits, specialised techniques can be used to estimate the value of benefits (see Step 5, Value Relevant Economic Benefits and Costs) while for others it may not be feasible[51] to do so. Some of the intangible benefits that cannot be valued may be quantifiable in other ways, which capture the scale of

[49] Economic benefits are sometimes mistakenly taken to consist solely of financial revenues from the sale of goods and services: if there is no financial revenue, then the positive effect is classified as a 'social impact' to be considered outside the analysis. This derives from a misinterpretation of the word 'economic' which is often associated with the productive economy. In keeping with international practice, a broader interpretation is adopted in this Manual which uses 'economic benefit' to mean all positive effects for society as a whole. In this terminology, social impact denotes where economic benefits fall, i.e., who is benefiting and not how they are benefiting. This is the focus of a social impact analysis.

[50] Effectively there is no market because it is impossible to collect payment. Other cases are where government sets the price of a publicly provided service at zero or at a price far below the economic value to society.

[51] The word 'feasible' is used deliberately here because some benefits will be extremely difficult to value, while others it will not be worth the effort involved, either because they are not significant enough to be material to the decision or because the costs involved are too high compared to the total value of the project.

the impact and the numbers of individuals/households/businesses affected[52], while others it may only be possible to describe in purely qualitative terms. In any case, all relevant and material benefits should be considered in order to arrive at a decision based on a comprehensive appraisal even if they are not included in a quantitative cost-benefit analysis (see Step 9, Identify the Preferred Alternative). Identifying and valuing benefits is usually the most difficult and time consuming part of an appraisal and the area where mistakes are most frequently made. Careful attention is therefore needed on identifying and valuing benefits.

The ultimate objective of any public project investment (and public expenditure in general), is to produce better outcomes for society, where an outcome is defined as a change in the general state of well-being in the community[53], such as:

- Reducing the incidence of childhood deaths;
- Improving the average level of educational achievement of the population; or
- Increasing the standard of living[54].

Project benefits can therefore take a number of forms, which can be valued, measured or described in different ways:

- Direct impacts on the efficiency of the operating entity through lower operating and maintenance costs, resulting in monetary savings for Government (these savings can be passed on to the public - where there is cost-recovery user-charging – be redeployed for public expenditure elsewhere or contribute to fiscal consolidation);
- Contributions to the achievement of outcomes or intermediate outcomes sought by government through the provision of public services and leading to a gain in well-being for the users of these services. Examples include: time savings for business and private users of an improved road; or improved amenity for users of a new solid waste management and disposal system.
- Positive externalities, i.e., spill-over benefits which accrue to third parties including society, rather than to the operating entity or intended beneficiaries of the project[55]. Examples include: amenity/leisure benefits from the creation of a reservoir the primary purpose of which is irrigation or water supply; or reduced congestion for non-users when users transfer to new or improved transport infrastructure.

Annex 2 lists typical economic benefits for projects in key sectors where the public sector intervenes[56]. Project promoters are advised to consult this annex when identifying benefits for their proposed projects[57].

[52] For example, number of households affected by noise above a certain level (measured in decibels) or measures of improved air quality (parts per million of pollutants).
[53] 'Specifying Outputs in the Public Sector', OECD, 2001
[54]These outcomes will correspond with the goals expressed in the Statement of Government Strategy. Often the outcomes/goals pursued by the Government will be stated in visionary language that may be too high-level for specifying benefits. In these cases, there will be medium-term, intermediate outcomes to which a project's direct contribution is more readily discernible. These will generally be expressed as goals in a ministry's Strategic Plan Outlines.
[55] There may also be negative externalities. See below under 'Economic Costs'.
[56] Annex 2 also identifies typical economic costs and approaches to economic analysis, as well as inflows and financial outflows for financial analysis.
[57] Annex 2 should also be consulted when preparing the Project Concept Note for the Pre-Selection decision.

If the chosen analysis period (see Step 2, Identify and Choose Project Alternatives for Appraisal) is shorter than planned life of the capital asset, then the asset may have some residual value remaining at the end of the horizon for decision-making. This should be added as a benefit in the final year of the analysis period. Even in cases where the asset is life-expired or has served its purpose it may have scrap value or an alternative use and this may be considered as a benefit. All the same, it is very difficult to estimate residual values for assets a long time into the future and it is best to err on the conservative side.

Some Common Mistakes in Identifying Benefits

There are some common mistakes made when identifying project benefits and should be avoided. These include:

Double-counting benefits: Sometimes there are two ways of looking at the same effect and to include both views as benefits would lead to double-counting. The benefits of an irrigation project can, for example, be measured either in terms of the present value[58] of the increased future income for farmers or as an increase in the value of farming land[59], but not both, since land values are a reflection of future income earning potential. Similarly, it would be wrong to include additively revenues from user charges and user benefits based on willingness-to pay[60] estimates for a water supply or sanitation project since a user charge is just the financial manifestation of (part of) a consumer's willingness to pay.

Counting 'job-creation benefits': The wages paid to labour are a project cost and not a benefit. Frequently, job-creation and the wages generated are mistakenly taken to be benefits. If there are reasons to believe that the market price of labour overstates the opportunity cost[61] either nationally or in a particular locality, then this can be reflected in a suitable downward adjustment in the wage rate to arrive at what is known as a shadow wage (see Step 5, Valuing of Economic Benefits and Costs). The social benefits of employment are then reflected as a lower money value for the cost of labour. Alternatively, the impact of the project on the local labour market can be considered as part of a social impact assessment[62] to be taken into account when a decision based on a comprehensive appraisal (see Step 10). In this case, project promoters must be very careful not to declare labour costs as benefits (and to take account of displacement effects – see next point).

Ignoring displacement effects: Additional economic activity generated around a project, e.g., along a new road or at new transport hubs, is sometimes counted as a secondary benefit of a project, ignoring the fact that economic activity will often have been displaced from elsewhere. Only the net additional economic activity can be assigned to the project and, even then, any additional investment costs associated with new activities should be accounted for.

Counting multiplier effects: At the national level, it is erroneous to include incomes generated from multiplier or 'second round' effects as benefits, since alternative uses for the same financial resources would also generate similar effects. There may sometimes be a case for

[58] See Step 6, for an explanation of discounting and estimation of present values.
[59] Based on the observed price of comparable land, which is already irrigated.
[60] See Step 5, Valuation of Economic Benefits and Costs, for an explanation of willingness to pay as a measure of consumer benefit.
[61] See Identification of Relevant Economic Costs below for an explanation of opportunity cost.
[62] See below for a discussion of requirements for social impact assessments.

examining multiplier effects when a project targets a particularly economically depressed locality. In this case, it may be interesting to understand the net impact on the local economy from second round effects, but these should not be confused with the benefits of the project from a national perspective.

Relevant Economic Costs

The two most important principles in defining a relevant economic cost are that it should:

- Involve the actual use of economic resources; and
- Reflect the cost of forgoing the alternative uses to which the resources could be put.

The emphasis on actual resource use reflects that fact that accounting costs are sometimes bookkeeping entries only or may include elements that merely represent transfers of resources within the economy[63]. Accounting costs, therefore, do not always involve the actual use of resources, resulting in important differences with economic costs. The second principle, which is central to economic analysis, is the concept of opportunity cost, i.e., the value of a resource in its next best alternative use (other than in the project). Assets, like land or buildings, already owned by the public sector provide an important example of the application of the opportunity cost concept because generally they will have alternative uses including in the private sector. They therefore have an economic cost, even if there is no direct financial cost.

Just as project benefits will be estimated for the entire analysis period, 'life-cycle' costs must also be estimated for a public investment project i.e., operating and maintenance costs must be taken into account along with the initial capital investment. This is critical for estimating net benefits and comparing project alternatives. The following is a checklist of typical project costs to aid identification:

Initial capital costs:

- Purchases of land and buildings
- Infrastructure and works
- Purchases of equipment, furniture, vehicles, computer hardware and software[64]
- Installation and implementation costs
- Development costs, including staff costs and consultancy and other professional fees
- Testing
- Training
- Contingency costs

Physical contingencies are allowances to cover unforeseen circumstances during project implementation or operation, such as increased construction costs due to unexpectedly difficult ground conditions. Whenever contingencies form part of the expected costs of a project, they should be included as an economic cost.

Opportunity costs of publicly owned capital assets, like land, buildings, equipment and vehicles that will be employed in the project.

[63] The issue of transfers is dealt with below in Valuing Economic Costs.

[64] Although intangible, software is classified as a fixed asset and software purchase or development must be treated like any other capital investment in a Project Appraisal.

Disruption during construction: this cost should not be overlooked, particularly for major projects in congested areas.

Replacement costs for any capital assets that come to the end of their lives during the analysis period. This may be an important consideration for project alternatives that involve extending the lives of existing assets or using lower specifications.

Staff costs recurring throughout the analysis period. These are the costs of employees' time to the employer and must include pensions, social charges and allowances[65], as well as basic salaries. Relevant staff may include those involved in:

- Management;
- Day-to-day operations;
- Support; and
- Ongoing training.

Operating costs recurring throughout the analysis period including:

- Maintenance costs (routine and periodic);
- Licensing and support costs for software;
- Bureau services (data processing and on-line services);
- Leasing and rental costs (relevant for project alternatives to new construction and ownership);
- Recurring contingency costs;
- Utilities and Services.

Attributable administrative overheads: some overhead costs may occur because of the project, but they must be demonstrably attributable to the project and not costs that would be expected to be the same with or without the project.

Negative externalities: These are negative effects on third parties, which do not affect the operating entity or the direct beneficiaries of the project, such as increased noise and air pollution from traffic using a new road[66] or landscape degradation from unsightly construction.

Greenhouse gas emissions are negative externalities with international ramifications. Project promoters must take account of the Government of Cyprus's international position on limiting carbon emissions and consider the most appropriate way of dealing with this cost when implementation and operation of the project is expected to generate an increase in emissions.

Mitigation costs: a corollary of negative externalities may be the need to build mitigation measures into the project design, particularly for severely negative environmental impacts or even for adverse social impacts.

Annex 2 to the Manual identifies relevant costs for typical projects in key sectors for public sector intervention according to international experience. Investment and operating costs are identified

[65] If allowances include accommodation allowances it would be wrong to include both these and the cost of constructing accommodation. This would be another example of double counting as described above.

[66] The issue of double-counting needs to be borne in mind when assessing externalities. Some traffic on a new road will have transferred from other roads, reducing negative externalities there.

separately from potential negative externalities. Project promoters are advised to consult the annex when identifying costs for their proposed projects[67].

Costs That Are Not Relevant to Economic Analysis

As opposed to physical contingencies mentioned above, price contingencies to cover general inflation should not be included in economic analysis as this is performed using values expressed in real terms, i.e., excluding inflation. However, such contingencies should be included in the budgetary analysis.

Depreciation is an accounting method for allocating the cost of a physical asset over its life span. It recognises that physical assets wear out by spreading the cost of purchasing the asset over its useful life. A depreciation allowance has no direct economic effect - it does not represent the actual use of resources, since these will already have been used up in creating the asset – so it should not be taken into consideration in deciding whether to purchase the asset in the first place. In effect, including both purchase cost and depreciation would be a case of double counting (see above in relation to Relevant Economic Benefits). If an asset wears out during the course of the analysis period, the cost of replacing it should be included when this happens (as indicated in the checklist above). Note that regular maintenance is not the same as depreciation[68] and should be included in costs (as indicated in the checklist above).

Capital charges or interest payments are accounting concepts and should not be included as costs in the economic analysis[69]. Capital charges are an accounting device reflecting the opportunity cost of funds tied up in owning capital assets, once those assets have been purchased. They are used to help test the financial case for retaining an asset and should not be included in the decision about whether or not to acquire an asset in the first place. Interest payments are a financial transfer within the economy (from borrower to lender) and should be ignored in the economic analysis, since they do not represent the actual use of resources.

Sunk costs must be ignored in economic analysis. A sunk cost is a cost that is incurred before the start of the analysis period. In this case the resources have already been committed and have no alternative use (or opportunity cost as defined above)[70]. Sunk costs are not relevant because they are the result of past decisions and should therefore not form part of future decisions[71]. Sunk costs are a particular issue when making the decision to recommence a project that has already been started, but then stalled, or when re-analysing a project where there has been serious costs escalation during implementation. In both these cases, costs that have already been incurred must not be included in an *ex ante* economic analysis.

[67] Annex 2 should also be consulted when drawing up the Project Concept Note for the Pre-Selection Decision.
[68] Maintenance is required to keep an asset on its planned depreciation path and if it is not performed, the asset will depreciate faster than planned.
[69] Nor should these three costs be included in a financial cost-benefit analysis which is an analysis based on actual cash flows. They are relevant to the other financial accounting statements mentioned below in Step 9, Assess Affordability and Sustainability.
[70] Costs that are irrevocably committed, although not necessarily incurred, are also sunk costs, but care has to be taken in defining 'irrevocable'. There may be penalties from withdrawing from contracts, but this does not make them irrevocable: the sunk cost is whichever is lower.
[71] Sunk costs are not a consideration when undertaking an *ex post* economic evaluation of a completed project. Here the full costs must be included in the economic analysis.

Step 5: Value Economic Benefits and Costs

Basic Principles in Valuing Economic Benefits and Costs

Proportionality: Depending on the nature of the project, valuing benefits and costs can be resource intensive, requiring surveys and in-depth analytical work. The approach set out in this Manual is required for all financially significant projects, defined in the Public Investment Management Guidelines as projects with a total capital cost of euro 5.0 million or more. Reasonable efforts to investigate and, where possible, value relevant and material benefits and costs are mandatory for significant projects but should be proportional to the size of the project. It is not generally expected, therefore, that the same depth of research and analysis will be carried out for a project costing, say, euro 5.0 million as for a project costing, say, euro 50.0 million. Exceptions to this principle are when smaller, but still financially significant, projects:

- Are particularly innovative, involving new or untried technologies for example; or
- Involve expenditures in areas already been identified as high risk, such as development of new software systems.

Incremental Benefits and Costs: Incremental benefits and costs should be estimated by reference to the do-nothing alternative[72]. This means that relevant costs are those in excess of what would be spent in the absence of the project and relevant benefits are those received in excess of what would be delivered in the absence of the project.

Use of market prices: While adjustments may often have to be made (as described below), the default assumption is that market prices are the best starting point for valuing benefits and costs. They are expected to be a good reflection of opportunity costs, such as labour and land, unless there is a clear market failure or distortion.

Use of real prices: Benefits and costs must be expressed in real terms (excluding the effects of general inflation). Benefits and costs should be valued in the prices of a common base year, which must be declared in advance to all analysts and decision-makers. The base year is usually the current year. Values estimated using prices from years prior to the designated base year should be adjusted upwards using the Consumer Price Index (CPI) published by the Statistical Service of Cyprus (CYSTAT).

Expected changes in the relative prices of critical project costs or benefits, i.e., real price movements unrelated to changes in the general price level, may be taken into account where there is strong evidence to support this. Possible examples might be:

- Declining real costs of information technology;
- Declining real costs of renewable energy;
- Increasing real costs of (specialised) labour due to productivity increases;
- Increasing real costs for pharmaceuticals; or
- Increasing real rental costs, such as office space.

Assumptions for forecasting future movements in the real prices of internationally traded commodities should be made at the national level. Project promoters should discuss their assumptions concerning relative prices movements with the Ministry of Finance (Budget Directorate) to ensure

[72] Unless an acceptable do-minimum has been agreed with DG EPCD. In this case, incremental costs and benefits are calculated with reference to the agreed minimum expenditure in the absence of the project.

that consistency with any assumptions adopted at national level. All assumptions concerning real price trends must be stated explicitly in the Feasibility Study.

Adjustment for taxes, subsidies and transfers are likely to materially affect the choice of preferred alternative. Indirect taxes (VAT for example), subsidies and social transfers (social security benefits, for example) do not entail the consumption or creation of economic resources, but merely represent the redistribution of resources from one part of society to another (from households to government and from government to households). As such, they should be excluded from the valuation of benefits and costs. This means that the market prices used to value benefits and costs are expressed net of indirect taxes and subsidies and the value of social transfers are not included as benefits or costs.

Rule of a half: Where a project will generate significant extra demand due to a reduction in the cost of accessing a service[73], the benefits accruing to new users must be treated in a different way to those going to existing users. This is because demand curves are downward sloping and the consumer surplus[74] gained by new users is on average less than that received by existing users: in fact, the marginal new consumer makes no consumer surplus gain, since the cost of the service will exactly matches his/her willingness to pay for the service. This effect is usually approximated by taking benefits to generated demand as being half the average benefit going to existing users. The rule of a half is most frequently applied in transport projects, where generalised cost reductions, including time savings, can generate substantial extra demand.

Valuing Economic Benefits

Valuing economic benefits can be the most difficult and resource intensive part of project appraisal and must be approached carefully. Reliable forecasts of the demand for the services deriving from the capital investment[75] (see Step 1, Define the Project Objectives and Scope) are always the starting point for the valuation of benefits. Without a robust estimate of the number of people, households or businesses likely to use a new facility there is no basis for estimating total benefits (or for designing a facility with the appropriate capacity).

Benefit estimates should be based on real or estimated market prices for the services[76] produced by the project, where these are observable. However, adjustments for tax and/or subsidies may be necessary, in line with the valuation principle set out above. Where the purpose of a public investment project is to produce existing goods or services more efficiently, the benefits can be estimated in terms of incremental changes in lifecycle costs and comparing the with and without situations. In these cases, benefits are measured in terms of cost savings, for which market valuations (with any necessary adjustments) can be used, in line with the guidance on the valuation of economic costs below.

[73] This does not need to be a reduction in the direct charge for a service, it can also be a reduction in other indirect costs associated with using a service, like travel time.

[74] Consumer surplus measures the difference between what a person is willing to pay for a good or service and the amount he/she is actually required to pay. When a good or service is obtained free of charge all of its value to the consumer is consumer surplus.

[75] In combination with recurrent expenditure over its lifecycle.

[76] In economic texts, 'good' is usually used to refer to both physical goods and services produced by a project. To avoid confusion, the Manual will, however, refer to 'services' since the budgetary outputs delivered by a capital asset (in combination with necessary recurrent expenditure) are generally public services and the public sector rarely produces physical goods. This should be borne in mind when referring to more formal guidance.

By their nature, many public services are free of charge, either because it is difficult or impossible to charge, for example in the case of public goods[77], or due to a policy choice because of generally accepted equity or social concerns. Health, educational success, family and community stability and environmental amenity are the kinds of intangible effects that fall into the category of benefits where there are no directly observable market values. By definition, services with positive externalities are provided free of charge. In cases where no market exists, alternative means of estimating values for benefits should be used, where feasible. These market-based approaches hinge on estimating potential users' willingness to pay (WTP) for the project benefits. WTP is the maximum payment that a beneficiary would be willing to give up in order to receive a public service[78] and is therefore a measure of the 'utility'[79] that a consumer expects to obtain.

WTP is constrained by ability to pay which depends on income. To allow for this, the practice should be to estimate average willingness to pay by income group. For projects where WTP is used to estimate benefits, but user-charging is nevertheless intended[80], it is very important to ensure consistency between willingness to pay and ability to pay or else financial sustainability may be compromised by weak take-up of new services (see Step 9, Assess Affordability and Sustainability)[81].

There are two approaches for estimating WTP. These are revealed preference techniques and stated preference techniques. Revealed preference techniques are generally considered to be more reliable and should be favoured where the required data is available. Stated preference techniques require careful design, involving advanced research methods, to produce acceptable results and should be employed judiciously. The choice of technique will need to be made on a case-by-case basis by project promoters, usually on the basis of advice from experts. Sometimes both techniques may be employed and the results may be compared to check consistency.

Revealed preference techniques involve inferring willingness to pay by examining potential users' past behaviour in similar or related markets. Information on past trade-offs made between costs and benefits in closely related contexts can provide indications of the readiness to pay for the kind of benefits that the project will deliver. Two frequently used revealed preference methods that may be applicable, depending on the nature of benefits, are:

- Hedonic pricing: Involves deriving values by decomposing actual market prices into their constituent characteristics to obtain insights into willingness to pay for benefits for which

[77] A pure public good (or service) is one where it is not possible to exclude users from consuming the good (service) and consumption by one consumer does not diminish the amount of the good (service) available for the others. These characteristics mean that there is no incentive for the private sector to supply the good (service) because it is impossible to earn revenues and make a profit.

[78] Willingness to accept (WTA) is a closely related alternative measure used to value negative impacts. This is the minimum payment that a beneficiary would need to be compensated to forego a benefit or accept a negative impact.

[79] 'Utility' is a concept used in welfare economics meaning the satisfaction or change in welfare that a person gets from consumption of a good or service.

[80] This is often the case for network utilities which have the characteristics of a natural monopoly. Tariffs are usually administered (either through regulation of the private sector by the public sector or through administered prices for a publicly owned provider). In these cases, there may be a divergence between user charges and willingness to pay. Usually the latter are higher than the former, but when a new project is likely to entail significant increases in user charges project planners will need to ensure that these are consistent with consumers' willingness and ability to pay.

[81] Economic viability is also evidently compromised by over-optimistic estimates of WTP that exceed consumers' ability to pay.

there is no directly observable market. An example would be using the difference between residential property prices at varying distances from an environmental amenity, e.g., a park or lake, to estimate the inherent utility of such amenities[82], and hence the benefit of creating similar new amenities.

- Travel cost analysis: Uses estimates of the total costs people are willing to incur to access free amenities as a minimum estimate of what they are willing to pay. So, for example, the generalised travel costs, including the value of travel time (see Box 1 for a discussion of the estimating time values), that people bear in travelling to a park or recreation facility, give an indication of the value they place on the amenities provided. This can then be used in valuing the potential welfare gain from similar new facilities. It is a minimum estimate because users will experience a gain in welfare in excess of their travel costs (otherwise they would not be willing to travel to and use the facility)[83]. Application of this technique requires the collection of good survey data on distance travelled, journey times, mode of transport, frequency of use and income from a representative sample of users of existing facilities similar to the proposed project.

Stated preference techniques simulate a market by using specially designed interviews or questionnaires to get users to state directly their willingness to pay for a service or to make hypothetical choices from which WTP can be inferred. Project promoters will almost certainly require specialised external expertise to advise them on stated preference techniques, especially for choice modelling, one of following two general methods which are potentially applicable:

- Contingent valuation studies either ask open-ended questions concerning the maximum amount a potential user would be willing to pay for a given service delivered through the project, or offer a constrained choice of values from which the respondent is asked to choose.
- Choice modelling presents potential users with a series of alternatives involving trade-offs between costs and benefits from which they are required to indicate a preference. This method is better for valuing specific attributes of a service than for valuing the service as a whole. It attempts to get around the potential biases that can arise from asking direct questions concerning hypothetical payments, but in doing so adds more complexity.

To illustrate the application of the approaches described above to valuing some important non-market economic benefits, three examples are provided in Box 1 below[84].

[82] Values would be expected to be higher closer to the amenity.

[83] This gain is referred to as 'consumer surplus' in economic terminology. A more sophisticated approach involves estimating a demand curve from travel costs and inferring total WTP from this.

[84] Examples from the Green Book, Appraisal and Evaluation in Central Government, HM Treasury, 2003 (with 2011 amendments dealing with the valuation of non-market goods).

Box 1: Some Examples from the United Kingdom of Approaches to Valuation of Non-Market Benefits

Example 1: Valuing Time Savings

Time savings frequently account for a significant share of the economic benefits from major transport projects. There are two types of time savings - work time savings and leisure time savings - and these are valued differently.

The value of employees' time savings during work is the opportunity cost of the time to the employer, which is equal to the cost of labor to the employer, made up of the gross wage rate plus non-wage labor costs such as social security charges, pensions and other costs that vary with the hours worked. Values of working time are based on the mileage weighted labor costs of users of each mode of transport.

Based on willingness-to-pay (WTP) evidence, non-working time is estimated to have a lower value than working time. There are variations in the value of non-working time to take account of WTP evidence that travelers place a higher value on walking and waiting time (savings are valued at double the value of in-vehicle savings). Overcrowded conditions in public transport and unreliability also carry a premium. In line with equity principles, national average standard values for all modes of transport are used.

The calculation of total benefits usually involves the aggregation of time savings across many users, as time savings for individuals will tend to be small.

Box 1: continued

Example 2: Valuing Accident Savings

Some projects, notably transport projects, will result in the prevention of injuries or fatalities. From a philosophical perspective it is impossible to put a value on life. A more appropriate starting point for measuring benefits is to measure an individual's WTP for a reduction in the risk of death. From knowing the willingness to pay for small changes in the risk of loss of life or injury the value of a prevented fatality or injury can be inferred. This is known as the value of statistical life (VSL). Measures used in the UK also include an allowance for the value friends, relatives and society as a whole place on preventing fatalities and injury.

Revealed preference studies can provide evidence of WTP for risk reduction. The examples of sources of information given in the Green Book are wage differentials between more or less risky jobs or WTP for safety devices such as smoke alarms or car air bags. Stated preference questionnaires have also been used to arrive at an estimate of the VSL. The Green Book warns, however, that results from these approaches tend to be imprecise.

In practice, the transport ministry values the reduction of the risk of death at £1.075 million (2010 prices) to which are added lost output (0.56 million) and medical and ambulance costs (£0.565 million) to give the total value of a fatality prevented. Values for preventing a serious or slight injury are also estimated at £184,000 and £14,000 respectively (2010 prices).

Box 1: continued

Example 3: Valuing Reduction in Noise Nuisance

Assessing the benefits of noise reduction (or the costs of increased noise) is not easy because of wide variations in individuals' tolerance of noise. Measurement and forecasting of noise is also a highly specialized field and requiring the use of appropriate expertise. Nevertheless, approaches have been developed and employed. For example, the impact of new transport infrastructure or industrial developments can be quantified according to the number of people/households affected by an increase or decrease of noise levels measured in average decibels. This approach can also be used to assess the impact of specific measures to control traffic. The Green Book quotes results from various European studies from which is derived a median WTP per household of €23.5 per decibel per year. Since the decibel scale is logarithmic care would need to be taken when applying this value to extreme changes (although this is not mentioned in the Green Book).

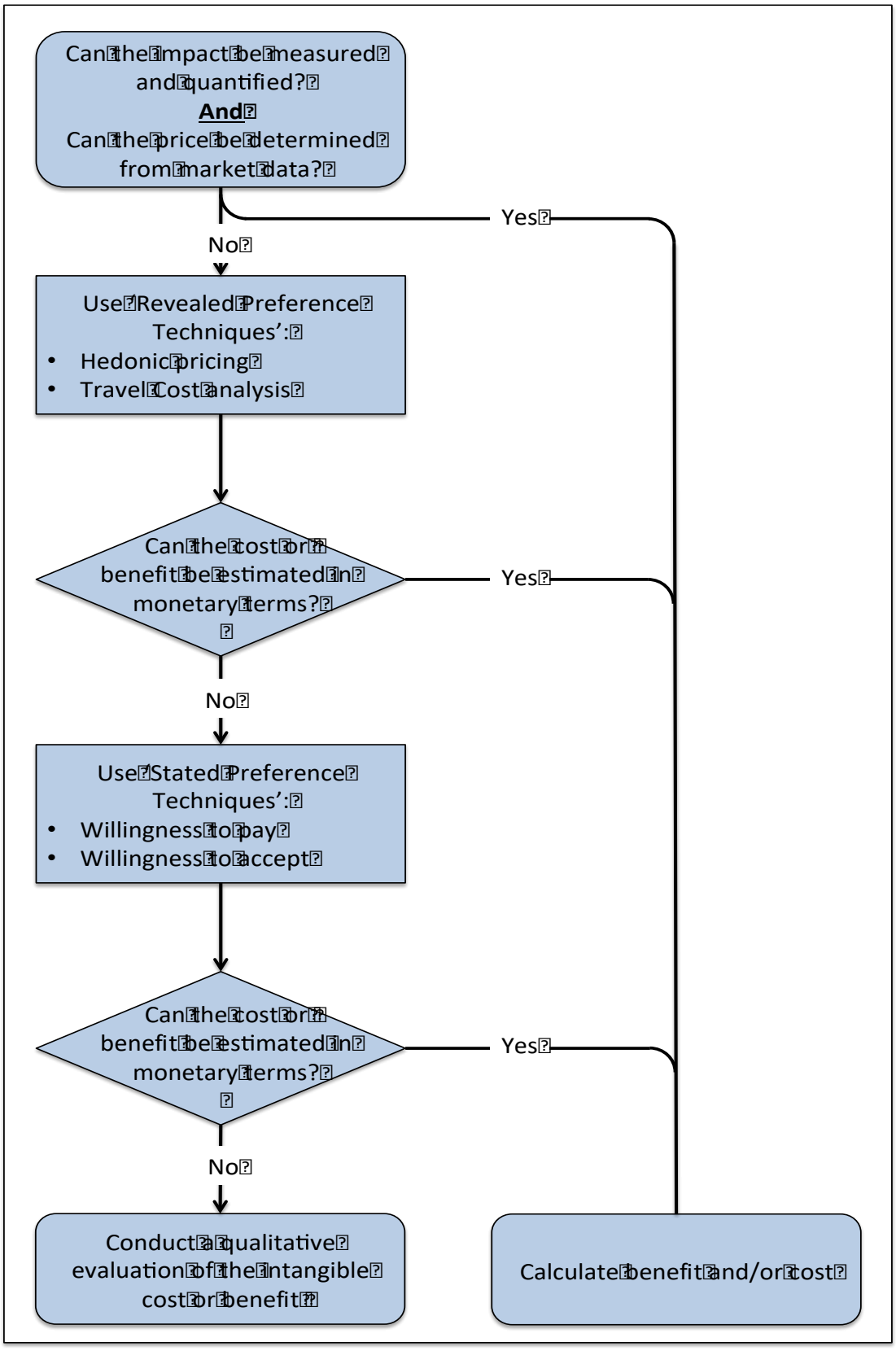
This finding could also be applied in valuing the costs of an increase in noise as well as the benefits of a decrease.

Source: Green Book, UK Treasury, 2003

Figure 2 summarises the approaches to estimating non-monetary benefits and costs described above. It is beyond the scope of this Manual to provide detailed guidance on approaches to the estimation of

all potential economic benefits from public investment projects by sector. Benefits and methods are sector specific and will be the subject of future sector guidance. To guide project promoters further, Annex 2 to the Manual gives an overview of some approaches to valuing benefits for typical projects in key sectors for public sector intervention.

Figure 2: Estimating Non-Monetary Benefits and Costs



Source: Cost Benefit Analysis Primer, New Zealand Treasury, 2005.

Valuing Economic Costs

Generally speaking valuing economic costs is more straightforward than valuing economic benefits, but still necessitates the involvement of suitable technical expertise. Project capital costs should be derived from a preliminary project design developed and costed by specialists with the necessary engineering expertise. Similarly, operating and maintenance costs must be derived on the basis of sound engineering advice and experience. Financial costs will also require adjustment to capture the real use of economic resources and allow for market distortions. As for benefits, not all costs will be reflected in financial transactions and care is therefore needed to ensure that the full range of economic costs has been valued where this is feasible.

Opportunity Cost of Public Assets: The notion of opportunity cost is critical to the valuation of economic costs. Publicly owned assets as inputs into a project must be valued using market valuations, even if there will be no actual financial transaction. This means that publicly-owned land should be valued at the best price that it would fetch on the open market (with adjustment for any important distortions) and must not be assumed to have zero cost. The next best use for public land identified for new government offices might, for example, be for private sector residential development and it should, in this case, be valued at the market rate for residential land. Similarly, any publicly-owned equipment or buildings that will be employed in the project must be valued at what they would fetch on the open market. Project promoters may need to call upon specialist expertise to assess the opportunity cost of major items, particularly land values.

Social Opportunity Cost of Labour: When labour markets work efficiently and there is no structural unemployment, the market wage rate is the best measure of the social opportunity cost of labour, i.e., the marginal value to society of a unit of labour in its next best alternative use. Imperfections in the way labour markets are working, policy-induced rigidities - such as minimum wage legislation - or macroeconomic imbalances may result in the opportunity cost of labour being less than the market rate. In these cases, an adjustment factor can be applied to estimate what is usually referred to as a shadow wage rate. Box 2 gives some examples of factors which could cause departures from an efficient market. Some of these factors will be region-specific, requiring a case-by-case analysis.

Box 2: Possible Causes of Labor Market Distortions

- Government subsidies to employment may result in the costs of labor for private companies to be less than the social opportunity cost.
- Legislation establishing a minimum wage, even if there are people willing to work for less.
- Informal or illegal sectors with no formal wages, but with a positive opportunity cost of labor.
- Fundamental macroeconomic unbalances and ‘stickiness’ in wages.

Source: Guide to Cost Benefit Analysis of Investment Projects, European Commission, Directorate General for Regional Policy, 2008

The shadow wage rate can be obtained as the weighted average of:

- The shadow wage for skilled and unskilled workers previously employed in similar activities: it can be assumed to be equal or close to the market wage;

- The shadow wage for unskilled workers drawn to the project from unemployment: it can be assumed to be equal to or less than the value of unemployment benefits; and
- The shadow wage for unskilled workers drawn to the project from informal activities: it should be equal to the value of the foregone output in these activities.

The weights applied should be proportional to the estimated amount of each labour resource employed in the project.

Calculation of a shadow wage rate will be technically demanding and is costly. Consequently, this should only be considered if the resulting adjustment is likely to have a significant bearing on the final investment decision. This could be the case if one of the project alternatives is very labour intensive or if the project is in a locality where unemployment or underemployment is notably acute.

As noted in the guidance above on valuing economic benefits, the revealed preference techniques and stated preference techniques described can also be used to estimate values for economic costs for which there are no market values, i.e., negative externalities. In this case, the techniques are used to measure willingness to accept (WTA), or the minimum compensation an affected party would require to be willing to tolerate a negative economic outcome, increased noise or pollution for example. In view of the similarity of approach there is no need to give further guidance on this issue here.

Potential Short-Cuts for Valuing Economic Benefits and Costs

Where national values have not yet been calculated, there are some Europe-wide and international studies from which values may potentially be derived for Cyprus (with adjustment for national context and base year), particularly for the transport and environment sectors[85]. Examples are:

- Developing Harmonised European Approaches for Transport Costing and Project Assessment (HEATCO)
    - http://www.transport-research.info/web/projects/project_details.cfm?ID=11056
- Update of the Handbook on External Costs of Transport
    - http://ec.europa.eu/transport/themes/sustainable/studies/doc/2014-handbook-external-costs-transport.pdf
- International Comparison of Transport Appraisal Practice (Appendix B to overview report)
    - https://www.gov.uk/government/publications/international-comparisons-of-transport-appraisal-practice
- Environmental Valuation Reference Inventory (EVRI)
    - https://www.evri.ca/Global/Splash.aspx

[85]This is known generally as the value transfer method.

Step 6: Calculate Net Present Values for Project Alternatives

Rationale for Discounting to Arrive at Present Values

A project's benefits and costs do not occur at the same point in time, cannot be added directly and must be adjusted to reflect society's preference for consuming goods and services sooner rather than later. For instance, construction costs are usually incurred over a period of more than a year and operating expenditures are then recurring once the capital asset is completed; benefits are enjoyed over the planned life of the asset; and maintenance expenditures are required routinely and periodically to ensure that the asset performs as intended. Cost-benefit analysis is concerned with comparing these streams of benefits and costs occurring over the life-cycle of a project (and its alternatives) to determine whether there is a net welfare gain to society. This adjustment is known as discounting and it reflects the fact that, even after allowing for inflation, a euro received this year is valued more highly than a euro received next year because, just like an individual, society as a whole is impatient to consume sooner rather than later.

The social discount rate is society's rate of time preference and is the rate used as a basis for converting future values into present value equivalents[86]. Expressing project benefits and costs occurring in different years in the future as present values puts them on consistent basis and allows them to be added together and compared. In economic terms, simply adding benefits and costs occurring at different times without this adjustment would be as nonsensical as adding together values expressed in euros and dollars without converting to a common basis using the exchange rate. Pursuing this analogy, the discount rate can be conceptualised as being the basis for an 'exchange rate' between values today and values in the future. Consistent with the principle that all benefits and costs should be expressed in real terms, the discount rate specified for calculating present values is also a real rate, i.e., it includes no allowance for inflation.

As an example of the effects of discounting, a benefit or cost of value euro 1.0 due in one year's time has a present value of 1/(1+r), where r equals the discount rate. Thus if the discount rate is equal to 5%, the value in one year's time is €0.952. Applying compounding principles and the same discount rate, one euro received in two years' time would have a lower present value of $1/(1+0.05)^2$ or €0.907. The compound discount factor - generalised as $1/(1+r)^t$, where t is the number of years from the base year - can be applied to a stream of future annual benefits, costs or net benefits over a specified analysis period to arrive at consistent present values that can then be added together to obtain a single measure.

The higher discount rate, the stronger is the preference for consumption today rather than tomorrow and the lower is the present value of a given future benefit. So with a discount rate of 10%, a benefit of one euro in one year's time would only have a present value of €0.909 compared to € 0.952 at a discount rate of 5%.

[86] The social rate of time preference reflects a number of factors: pure time preference, i.e., individuals' impatience to consume now rather than waiting, assuming unchanged per capita incomes over time; risk of catastrophe, such as war, that eliminates all project returns – difficult to quantify, but not zero; the fact that economies tend to grow over time and each additional unit of consumption is valued less than the previous (this is the economic concept of the declining marginal utility of consumption) and implying that consumption by future (richer) generations should be valued less than consumption by today's (poorer generation).

The Discount Rate for Cyprus

The social discount rate for Cyprus has been established using the approach set out in Annex 8 to the Manual. This involves using a composite methodology, whereby the risk-free social rate of time preference - established by using the generally accepted Ramsey Formula[87] and estimates of its component parts - is supplemented by an allowance for systemic risk,[88] established by reference to the estimated compensation for risk ('risk premia') required by investors in markets of most relevance to public sector investment activity in Cyprus[89].

The real risk-adjusted social discount rate established by this approach is 4%.[90] This rate is to be used in calculating economic present values for cost and benefits streams occurring in the first 40 years of the life of public investment projects. In common with a growing consensus in other advanced countries,[91] a lower social discount rate of 2% is to be used for calculating costs and benefits occurring after 40 years. The main rationale for declining long-term discount rates derives from uncertainty about the future, which has been shown to cause declining discount rates over time. A declining discount rate is also consistent with arguments in favour of inter-generational equity and is supported by behavioural research. The lower social discount rate will mostly apply to environmentally-oriented investment projects with long-term environmental effects and to general public investment projects which create particularly long-lived infrastructure assets with important benefits and/or costs in the very long-run.

The applicable social discount rates and their component parts are given in Table 5.

Table 5: Social Discount Rates for Cyprus Depending on Project Time Horizon

Social Discount Rate	Year 0-40	After Year 40
Risk-free rate	2.5%	2.0%
Risk premium	1.5%	0.0%
Risk-adjusted rate	4.0%	2.0%

[87] The Ramsey Formula is commonly used as the basis for establishing the risk-free social rate of time preference as a measure of the social discount rate. Germany and the United Kingdom are among the countries that have used this approach.

[88] Systemic risk is risk that is not specific to a particular project. It differs from specific risks which are taken into account in the project risk analysis.

[89] Internationally, systemic risk is increasingly being taken into account when establishing the social discount rate. France and Norway are examples of countries that have recently revised their social discount rates and included an allowance for risk. For Cyprus, risk premia have been estimated using the capital asset pricing model (CAPM).

[90] This compares with 5% suggested in the EU (Directorate General for Regional and Urban Policy) Guide to Cost-Benefit Analysis of Investment Projects (2014), for those Cohesion countries that do not estimate their own social discount rate. The difference is explained mainly by the lower expected future growth of consumption in Cyprus compared to other lower income Cohesion countries. A rate of 3% is suggested for non-Cohesion countries and social discount rate for Cyprus is therefore situated in the middle of the two suggested rates.

[91] France, the United Kingdom and, more recently, Norway are all applying declining discount rates for the long-term.

Annual Cash Flow Forecasts

The starting point for discounting and arriving at present values is to determine the forecast project 'cash flows'. This requires bringing together the estimated values for benefits and costs derived in Step 5 and assigning them to the relevant year of the project analysis period.

It is necessary to decide on an appropriate analysis period. As a general rule, the period of analysis should usually extend to the economically useful life of the asset created by the project. For infrastructure projects a 20-30 year analysis period tends to be used. For short-lived equipment purchases or ICT solutions, a significantly shorter period should be used. When comparing alternatives, it is important that this should be done over a uniform analysis period. If a project alternative has a useful life shorter than the analysis period, then a repeat project should be included in the cash flows at the end of its useful life.

An example is given in Table 6 for a hypothetical road improvement project analysed over a period of 20 years. The cash outflows are the project costs - capital and maintenance – and the inflows are the benefits – time savings, vehicle operating cost savings and accident savings. Subtracting outflows from inflows in each year yields the net cash flow position (or net benefits) for each year of the project. This can be negative or positive depending on the balance between benefits and costs in any given year.

Table 6: Example of Economic Cash Flows for a Road Project

(euro million)

Year	Cash Outflows/Costs (C)		Cash Inflows/Benefits (B)			Net Benefits (B-C)
	Capital	Maintenance	Time Savings	Vehicle Operating Cost Savings	Accident Savings	
1	€ 10.0	-	-	-	-	-€ 10.0
2	€ 30.0	-	-	-	-	-€ 30.0
3	€ 20.0	-	-	-	-	-€ 20.0
4	-	€ 0.5	€ 4.0	€ 2.0	€ 0.5	€ 6.0
5	-	€ 0.5	€ 4.2	€ 2.1	€ 0.5	€ 6.3
6	-	€ 0.5	€ 4.4	€ 2.2	€ 0.5	€ 6.6
7	-	€ 0.5	€ 4.6	€ 2.3	€ 0.5	€ 7.0
8	-	€ 4.0	€ 4.9	€ 2.4	€ 0.6	€ 3.8
9	-	€ 0.5	€ 5.1	€ 2.6	€ 0.6	€ 7.7
10	-	€ 0.5	€ 5.4	€ 2.7	€ 0.6	€ 8.1
11	-	€ 0.5	€ 5.6	€ 2.8	€ 0.6	€ 8.5
12	-	€ 0.5	€ 5.9	€ 3.0	€ 0.6	€ 9.0
13	-	€ 4.0	€ 6.2	€ 3.1	€ 0.6	€ 5.9
14	-	€ 0.5	€ 6.2	€ 3.1	€ 0.6	€ 9.4
15	-	€ 0.5	€ 6.2	€ 3.1	€ 0.7	€ 9.5
16	-	€ 0.5	€ 6.2	€ 3.1	€ 0.7	€ 9.5
17	-	€ 0.5	€ 6.2	€ 3.1	€ 0.7	€ 9.5
18	-	€ 4.0	€ 6.2	€ 3.1	€ 0.7	€ 6.0
19	-	€ 0.5	€ 6.2	€ 3.1	€ 0.7	€ 9.5
20	-€ 10.0	€ 0.5	€ 6.2	€ 3.1	€ 0.7	€ 19.6

For the financial analysis of commercial project, the inflows and outflows would represent financial transactions on the part of the project operators. As the hypothetical example in Table 6 illustrates, cash flows in an economic analysis do not, however, have to represent actual financial transactions: road users do not pay the road agency for the savings they will reap from a specific road project (except in the special case of a toll road). The road pavement may have a planned life of 20 years, but the structures will last longer. To allow for this a residual value is included as a negative cash outflow in the final year of the project. Again, this will involve no financial transaction.

Calculating Net Present Value

The net present value (NPV) is the sum of the discounted net cash flows over the chosen analysis period. A positive NPV indicates that total project benefits outweigh total project costs after benefits and costs occurring in different years have been expressed on a common basis using the discounting technique described above. This means that the project represents a good use of public money from society's point of view. A negative NPV indicates the opposite. NPV is the core criterion for determining the economic viability of a project when all material benefits and costs can be valued. Calculating the NPV is straightforward and can be performed automatically using an Excel

spreadsheet and by applying the relevant formula. The real work of economic analysis lies in estimating values for benefits and costs, as carried out in Step 4.

Calculation of the NPV is illustrated in Table 7 for the same hypothetical road project as Table 6. Once the stream of net cash flows has been calculated (as demonstrated in Table 6), each annual net benefit can be discounted to a present value using the appropriate compound discount factor. In the example, a discount rate of 5% has been used to derive these discount factors and to arrive at a present value of net benefits for each year. Summing this stream of present values yields the NPV, a measure of the social worth of the project[92]. In the example, the road project has a positive NPV of €22.9 million, indicating that the project is economically viable, assuming that all important costs or benefits have been quantified.

The mathematical equation for NPV is:

$$NPV = \sum_{t=0}^{t} \frac{(B_t - C_t)}{(1+r)^t}$$

Where

B = benefit (or cash inflow)

C = cost (or cash outflow)

B-C = net benefit (or net cash flow)

t = time in years

The NPV for each project alternative identified for economic analysis, including the initial project concept, should be calculated using the approach set out in Table 7[93]. Other things being equal, the project alternative with the highest positive NPV will represent the best use of public money and is to be preferred over other alternatives. Since benefits and costs are often calculated incrementally by reference to the do minimum alternative (see Step 5), no NPV for this alternative will be calculated as it is implicitly zero[94]. In this case, if NPVs for all other alternatives are negative, the do minimum alternative is to be preferred, other things being equal.

Calculating the NPV is also not the end of the story for many public sector projects. The phrase 'other things being equal' in the previous paragraph is important, because very often they are not. The highest positive NPV may not always be the deciding factor when other important factors intervene. The project with the highest NPV may not be the preferred alternative if other alternatives have significant intangible benefits that cannot be valued. In the hypothetical example given in Table 7, for example, no allowance has been made for the cost of noise nuisance from increased traffic or for

[92] There is another way of arriving at NPV which is exactly equivalent. This is to calculate the present value of benefits and costs separately in each year, sum these separately to arrive at net present costs (NPC) and net present benefits (NPB), and deduct NPC from NPB to arrive at NPV. The approach used is purely a presentational issue.

[93] Evidently the nature of the costs and benefits will differ from project to project and from sector to sector. Annex 2 should be consulted in this regard.

[94] This is not obligatory and NPVs for all alternatives, including the do minimum, may be estimated by comparison to doing nothing.

community severance impacts[95]. These may be important effects that decision-makers will have to take into account. Likewise, a project with a negative NPV might be assessed as a good use of public money, once important intangible benefits not captured in the NPV are taken into account. NPV should therefore be viewed by project promoters as one input - although the most objective input - into the more comprehensive decision-making process which is set out as Step 8. The case when an NPV cannot be calculated, because it is not possible to value any of a project's intangible benefits, is discussed below. In this case, cost-effectiveness analysis is the appropriate technique to aid decision-making.

Even when the NPV is capturing the most important costs and benefits, the issue of risk is an important variable affecting the economic viability of a project and the trade-offs between alternatives. This is discussed in Step 7.

[95] Approaches to valuing intangibles like these have been set out in Step 5, but it may not be feasible to implement these.

Table 7: Example of the Calculation of Economic Net Present Value for a Road Project

(euro million)

Year	Cash Outflows/Costs (C)		Cash Inflows/Benefits (B)			Net Benefits (B-C)	Discount Factors (DF) r = 5%	Discounted Net Benefits (B-C)*DF
	Capital	Maintenance	Time Savings	Vehicle Operating Cost Savings	Accident Savings			
1	€ 10.0	-	-	-	-	-€ 10.0	0.952	-€ 9.5
2	€ 30.0	-	-	-	-	-€ 30.0	0.907	-€ 27.2
3	€ 20.0	-	-	-	-	-€ 20.0	0.864	-€ 17.3
4	-	€ 0.5	€ 4.0	€ 2.0	€ 0.5	€ 6.0	0.823	€ 4.9
5	-	€ 0.5	€ 4.2	€ 2.1	€ 0.5	€ 6.3	0.784	€ 4.9
6	-	€ 0.5	€ 4.4	€ 2.2	€ 0.5	€ 6.6	0.746	€ 5.0
7	-	€ 0.5	€ 4.6	€ 2.3	€ 0.5	€ 7.0	0.711	€ 5.0
8	-	€ 4.0	€ 4.9	€ 2.4	€ 0.6	€ 3.8	0.677	€ 2.6
9	-	€ 0.5	€ 5.1	€ 2.6	€ 0.6	€ 7.7	0.645	€ 5.0
10	-	€ 0.5	€ 5.4	€ 2.7	€ 0.6	€ 8.1	0.614	€ 5.0
11	-	€ 0.5	€ 5.6	€ 2.8	€ 0.6	€ 8.5	0.585	€ 5.0
12	-	€ 0.5	€ 5.9	€ 3.0	€ 0.6	€ 9.0	0.557	€ 5.0
13	-	€ 4.0	€ 6.2	€ 3.1	€ 0.6	€ 5.9	0.530	€ 3.1
14	-	€ 0.5	€ 6.2	€ 3.1	€ 0.6	€ 9.4	0.505	€ 4.8
15	-	€ 0.5	€ 6.2	€ 3.1	€ 0.7	€ 9.5	0.481	€ 4.6
16	-	€ 0.5	€ 6.2	€ 3.1	€ 0.7	€ 9.5	0.458	€ 4.3
17	-	€ 0.5	€ 6.2	€ 3.1	€ 0.7	€ 9.5	0.436	€ 4.1
18	-	€ 4.0	€ 6.2	€ 3.1	€ 0.7	€ 6.0	0.416	€ 2.5
19	-	€ 0.5	€ 6.2	€ 3.1	€ 0.7	€ 9.5	0.396	€ 3.8
20	-€ 10.0	€ 0.5	€ 6.2	€ 3.1	€ 0.7	€ 19.6	0.377	€ 7.4
							NPV	€ 22.9
							EIRR	9.1%
							BCR	1.4

Complementary Measures of Economic Viability

Other measures of economic viability can be calculated, but these should generally be viewed as secondary and complementary to NPV.

The economic internal rate of return (EIRR) is the discount rate that would give an NPV of zero given the cash flow forecasts for the project. Generally speaking, if the EIRR is above the official discount rate a project would have a positive NPV and should be seen as a worthwhile use of public money. The EIRR for the road example in Table 7 is calculated as 9.1%[96], which substantially is higher than the assumed discount rate of 5%, indicating the economic viability of the project (but bear in mind earlier provisos about unvalued costs). This is the same finding as using the NPV indicator. EIRR is sometimes used where no discount rate has been set to confirm economic viability[97] and to rank alternatives. EIRR can also be useful for benchmarking against international experience, since economic performance is usually expressed in terms of EIRR in comparative studies.

In most circumstances the EIRR produces sensible results, but some care has to be taken, particularly when a project has an unusual cash flow profile, because it can produce some unusual results:

- In some special cases, it may not be possible to find the EIRR, i.e., there is no discount rate that gives a zero NPV.
- There may also be cases where there is more than one discount rate that gives a zero NPV[98].
- EIRR is not scale sensitive so that a small project with a high EIRR, but a relatively low NPV could be favoured over a much larger project with a lower EIRR, but significantly higher NPV. The more reliable NPV indicator would favour the larger project. However, this is more relevant for making decisions between mutually exclusive projects rather than assessing the economic viability of an individual project and its alternatives, which is the subject of this part of the Manual.
- EIRR also assumes that returns from the project are reinvested in the project (or similar projects) at the same rate of return, whereas this might not be the case, so that it exaggerates the rate of return[99].

The advice is therefore that the EIRR is a useful subsidiary indicator, but the NPV should be given precedence.

The benefit-cost ratio (BCR) is another way of expressing the balance between the present value of benefits and the present value of costs:

$$BCR = \frac{sum\ of\ present\ values\ of\ benefits\ (cash\ inflows)}{sum\ of\ present\ values\ of\ costs\ (cash\ outflows)}$$

A BCR of greater than unity means that the NPV of the project is greater than zero. In the example given in Table 7, the BCR is calculated as 1.4, confirming that the project is economically viable.

[96] It is straightforward to calculate the IRR using the relevant Excel formula.
[97] Although the discount rate may not have been set, economic viability is assumed if the EIRR is higher than any reasonable value that the discount rate might take.
[98] This is possible for projects where net benefits change sign more than once over the payment stream.
[99] Another indicator, the modified internal rate of return (MIRR) has been devised to try to get round this problem. This is more relevant for financial analysis of commercial ventures than for economic analysis though.

Since all the same information is required to calculate the BCR as for the NPV, this indicator does not really add much to the analysis of an individual project and its alternatives. It can, however, be useful in ranking different projects (not project alternatives) in the same sector (roads for example) within a constrained budget. Choosing projects with the highest BCR will generally help to ensure maximum economic value for public money[100].

Cost-Effectiveness Analysis

Cost-effectiveness analysis is similar to cost-benefit analysis but it does not involve placing money values on the major benefits of a project. Instead, benefits are expressed in physical units rather than in monetary terms. Cost-effectiveness analysis compares the cost of alternative ways of producing the same or very similar outputs or outcomes. The results can be expressed either as a cost (euros) per unit output/outcome or as outputs/outcomes per euro. Just as for cost-benefit analysis, costs over the life-cycle of a project are discounted to arrive at present values and a net present cost for the project. The latter can be divided by the volume measure of outputs/outcomes to arrive at a unit cost (or vice versa).

It is often used to find from a range of alternatives the one that meets a predefined objective at minimum cost. It can also be a useful tool as part of an initial analysis of alternatives prior to a cost-benefit analysis to identify a short-list of project alternatives to take forward for more in-depth cost-benefit analysis.

Cost-effectiveness analysis provides a measure of the relative effectiveness of alternative projects in achieving a given objective. It is applied in situations where it is easier to identify benefits than to value them, thus it is more widely used in the areas of health, education and safety, where there are some difficulties in putting money values on benefits like improvements in life expectancy, reductions in illness and raised educational quality. The limitation of cost-effectiveness analysis is that it does not provide a criterion for accepting or rejecting a project, because costs and benefits are not directly comparable. If a political decision has been made to undertake certain expenditure, for instance on pure public goods, cost-effectiveness analysis can be applied to ensure that services are provided in the most efficient way possible. In this example, the value of benefits no longer matters because a political decision has been made to provide them anyway. Meeting legislated minimum environmental standards, including those derived from EU directives, would be one example.

Cost-effectiveness is illustrated by the very simple example shown in Table 8. In the example, a piece of equipment needs to be replaced, say a heating system for a public building. There are two alternatives one more expensive than the other. The advantage of the more expensive alternative is that it has lower operating costs. Both pieces of equipment deliver the same performance in terms of heat output and both have the same expected life of 10 years. As in the previous example discount factors are applied to total cash outflows (costs). There are no monetary inflows. In this particular case, the calculation of net present cost (NPC) for both alternatives shows that Alternative A, which has a lower capital cost but higher operating costs, is the most cost-effective solution with an NPC of €8.1 million compared to €8.5 million for Alternative B.

[100] There are more complex methods of optimizing total NPV from a set of economically viable projects under a budget constraint, but these involve complex modelling.

Table 8: Comparison of Net Present Costs of Two Alternative Replacement Heating Systems

(euro million)

Year	Alternative A					Alternative B				
	Capital Cost	**Operating & Maintenance Costs**	**Total Cost**	**Discount Factor**	**Present Value of Costs**	**Capital Cost**	**Operating & Maintenance Costs**	**Total Cost**	**Discount Factor**	**Present Value of Costs**
1	€ 5.0		€ 5.0	0.952	€ 4.8	€ 7.5		€ 7.5	0.952	€ 7.1
2		€ 0.5	€ 0.5	0.907	€ 0.5		€ 0.2	€ 0.2	0.907	€ 0.2
3		€ 0.5	€ 0.5	0.864	€ 0.4		€ 0.2	€ 0.2	0.864	€ 0.2
4		€ 0.5	€ 0.5	0.823	€ 0.4		€ 0.2	€ 0.2	0.823	€ 0.2
5		€ 0.5	€ 0.5	0.784	€ 0.4		€ 0.2	€ 0.2	0.784	€ 0.2
6		€ 0.5	€ 0.5	0.746	€ 0.4		€ 0.2	€ 0.2	0.746	€ 0.1
7		€ 0.5	€ 0.5	0.711	€ 0.4		€ 0.2	€ 0.2	0.711	€ 0.1
8		€ 0.5	€ 0.5	0.677	€ 0.3		€ 0.2	€ 0.2	0.677	€ 0.1
9		€ 0.5	€ 0.5	0.645	€ 0.3		€ 0.2	€ 0.2	0.645	€ 0.1
10		€ 0.5	€ 0.5	0.614	€ 0.3		€ 0.2	€ 0.2	0.614	€ 0.1
				NPC	€ 8.1				NPC	€8.5

Step 7: Analyse Risks[101] and Plan for their Management

The NPV (and NPC) calculation in Step 6 was performed as if the underlying values of benefits and costs are certain. In the real world, these values will be uncertain due to unavoidable measurement and estimation errors and due to perfectly reasonable assumptions not turning out as anticipated. Systematic errors (i.e., bias) may also have been introduced as a result of planners' natural responses to the incentive environment that they are facing. The quantified economic analysis is therefore not complete without a systematic analysis of the risks behind a project and an assessment of their likelihood and impact. The analysis in Step 7 should be taken as applying to both the reference project and to project alternatives.

Identify the main sources of risk for the project and assess their likelihood and impact.

A risk is an uncertain event or condition that, if it occurs, has a positive or negative effect on a project. Risks exist as a consequence of uncertainty concerning key parameters of a project (e.g., cost, implementation time, demand for services, etc.). Broadly speaking, uncertainty produces exposure to the danger of failing to:

- Keep within the project budget;
- Achieve the required project completion date;
- Meet required design specifications; and
- Achieve the required project purpose.

Each of these outcomes would have a negative outcome on the NPV estimate.

Risk analysis and risk management represent a structured approach to identifying, assessing and controlling the risks that could emerge during a project's life-cycle. Risks can be categorised as follows:

- Construction risk: Asset not completed on time, to budget or to specification
- Demand risk: Demand for services does not meet forecasts
- Design risk: Design cannot deliver services at the required performance or quality standards
- Economic risk: Project costs or benefits affected by economic influences, e.g., inflation or exchange rate movements
- Environmental risk: Negative environmental impacts cause major objections from public
- Funding risk: Availability of funding delays project or changes scope
- Legislative risk: Changes in legislation increase costs, e.g., tightening of environmental standards
- Operation & maintenance risk: Costs of operating and maintaining new facility differ from planned budget
- Procurement risk: Shortfall in capacities of contractors or contractual disputes
- Technological risk: Services provided using non-optimal technology because of rapid technological change

For financially significant projects, risk analysis will also begin at Pre-Selection stage with the drawing up of the PCN, but it will be extended to quantitative risk analysis as part of project

[101] Sometimes risk and uncertainty are distinguished. Risk refers to situations where probabilities are known and it is therefore measureable. Uncertainty refers to situations with unknown probabilities and is vaguer. In practice the distinction is difficult to make: probabilities are rarely known with any certainty and it is usually possible to assign a probability, however rough, to a particular event. The Manual therefore avoids making this distinction.

appraisal. At a minimum, quantitative analysis of risk should involve sensitivity analysis and/or the calculation of switching values (see guidance below). More advanced quantitative analysis should be employed for major projects or highly innovative projects which are likely to be replicated. This involves the measurement of uncertainty attaching to critical parameters, for example, cost, time and demand estimates and the probabilistic combination of individual uncertainties to arrive at an expected outcome[102] for the project.

Sensitivity analysis involves establishing the extent to which the results of the quantified economic analysis (NPV or, in the case of CEA, NPC) are sensitive to changes in the values of the key input parameters such as capital costs, future demand or length of implementation period. The NPV is recalculated on the basis of less optimistic[103] values for important variables or using less flattering assumptions. Generally, it involves raising important elements of costs or reducing important benefits by given percentages and observing the impact on NPV. As well as testing the robustness of the NPV estimate, at its most useful, sensitivity analysis helps identify those variables that are most critical to project success and which may therefore need managing more carefully (see risk management planning below) or analysing in more depth.

In practice, values for input parameters for economic analysis may be interdependent or subject to systemic estimation biases (see, for example the discussion of optimism bias below). For this reason, it is sensible to conduct scenario analyses whereby the quantified economic analysis is subjected to simultaneous changes in key input parameters to test the sensitivity of the results. A number of different 'what-if' scenarios can be formulated, each with different combinations of input values for key variables and/or assumptions. The two scenarios that should always be considered are the 'worst-case' scenario and the 'best-case' scenario. In these two scenarios, the sensitivity of the project's economic viability to the most pessimistic and optimistic combinations of key input parameters is tested[104].

At a minimum, the following tests should be performed:

- Recalculate NPV assuming a 10% increase in total capital costs
- Recalculate NPV assuming a 25% increase in total capital costs
- Recalculate NPV assuming a 10% decrease in total benefits
- Recalculate NPV assuming a 25% decrease in total benefits
- Recalculate NPV assuming a simultaneous increase in capital costs of 10% and decrease in benefits of 10% - the basic pessimistic scenario
- Recalculate NPV assuming a simultaneous increase in capital costs of 25% and decrease in benefits of 25% - the basic worst-case scenario

These tests can be performed straightforwardly on an Excel spreadsheet. In addition, Excel's 'What-If' function can be used to develop more elaborate scenarios.

[102] Using the statistical meaning of an expected value.

[103] If the main analysis is performed on the basis of best estimates of variables it is usually not very interesting to use more optimistic assumptions. If best estimates show that the project is not worth doing, then there is usually no need to investigate further using more favorable values, especially when potential optimism bias is taken into account. If the main analysis already shows a project to be worth doing, then there is little value in showing it in an even better light.

[104] The quantitative economic analysis will initially have been performed using the best estimates of costs and benefits and the underlying parameters (demand forecasts, for example). This is usually known as the base case.

More complex scenarios, reflecting different assumptions concerning technological, regulatory or economic factors can be developed and tested using more sophisticated techniques, including probabilistic analysis of values for key variables. This will generally only be required for very large and complicated projects though. In these cases, Economic Entities promoting projects may need to ensure specialist advice on developing and testing scenarios.

Estimation of switching values is a variant of sensitivity analysis. A switching value for an input variable, such as capital cost, is that value at which the project's NPV turns zero. A switching value is generally expressed as the percentage reduction/increase in the value of a variable required to reduce the NPV to zero. Once a switching value (percentage) is determined, the likelihood of this occurring can be considered by reference to experience with other projects. Switching values are relatively easily calculated using an Excel spreadsheet and are helpful in conceptualising the robustness of the economic case.

Expected values: When the probability distribution of important input variables underlying the NPV are known or can be estimated, then it is possible to estimate the expected[105] NPV (ENPV) for a project. In theory, this is a better measure of economic viability because it takes account of the probabilities associated with the different risks that might affect project performance. Sensitivity analysis can help to identify the parameters of most concern, for which further investigation and analysis of probabilities may be pursued.

The expected value of a variable is the sum of its possible values times their probabilities. Thus if the NPV of a project can take the values €2.0 million, €7.0 million or €11.0 million, with respective probabilities of 35%, 50% & 15%, then the expected NPV value is €5.85 million [106]. Depending on the form of the probability distribution, an expected value is not necessarily the same as the most likely value. In this example, the most likely value (the mode) is €7.0 million, whereas the expected value is €5.85 million. Using expected values can therefore give a different answer concerning economic viability and, in general, the ENPV should be considered to give a more reliable measure of economic performance if decision-makers have a neutral attitude towards risk[107].

Estimating ENPV is usually more complicated than the simplified example above because it is unlikely that the probability distribution for the NPV can be known or inferred directly. It will therefore involve approximating probability distributions for key input variables used in estimating benefits and costs and generating a probability distribution for the NPV. On the basis of the probability distribution so derived, the ENPV can then be estimated. The same can be done for different alternatives and compared. For projects for which CEA is performed (because it is difficult to value benefits) the expected net present costs of alternatives can be estimated and compared.

For most financially significant projects, the extended risk analysis involved in estimating the ENPV is not a requirement and sensitivity analysis will suffice; however, for high value projects facing complex risks it should be considered and may be requested by DG EPCD, depending on their perception of the complexity of the risks involved.

Optimism bias is an example of a systematic planning risk that besets most projects. It is defined as the systematic tendency of project planners to under-estimate costs and over-estimate benefits. It is

[105] 'Expected' in a statistical sense.

[106] (2*0.35)+(7*0.5)+(11*0.15)=5.85

[107] If decision-makers are risk averse, their preferences will lean towards the more certain outcome.

not easy to guard against this risk. One way is to employ independent external reviewers during the project appraisal process. Another way is to look back at previous projects of a similar nature and examine to what extent costs were under-estimated and benefits over-estimated and adjust the estimates used in the calculation of NPV accordingly. The DG EPCD will itself examine all project appraisals very carefully for evidence of optimism bias and will propose adjustments where considered necessary.

Present a plan for managing key risks, including mitigation measures and/or reactive measures should the risks occur.

Risk management involves the formulation of management responses to the main risks. The immediate response is to alter the project plan so that the identified risks are mitigated or removed. The contingency response is to make provision in the project plan for actions to be implemented only if the negative risk materialises. Possible risk management responses therefore include:

a) Identifying immediate preventive measures to remove or reduce a risk, e.g.:
    - Phased implementation
    - More flexible design
    - Less reliance on leading-edge or unproven technologies
b) Establishing contingency plans to deal with risks if they occur and minimise their consequences.
c) Initiating further investigations to reduce uncertainty through better information, e.g., pilot projects, more site investigations.
d) Avoiding irreversible decisions and/or adopting the precautionary principle with respect to unlikely, but catastrophic, events.
e) Considering transferring risk to other parties, e.g., through choice of procurement method and contract design.
f) Setting adequate contingencies in cost estimates and budgets.
g) Accepting the risk if the expected benefits from taking the risk outweigh the potential negative impacts (and no other courses of action seem feasible).

A risk management plan sets out the most important risks and their likelihood, assigns responsibility for managing them, describes how they will be monitored and sets out the planned responses should the risks materialise. All financially significant projects are expected to have a risk management plan. This can be simple outline plan for smaller projects, but for major projects it should be a fully developed plan. It is only necessary to prepare a risk management plan for the reference project, unless the approach to the management of risk is a clear factor in deciding between alternatives.

3.3 Completing a Comprehensive Project Appraisal

Step 8: Assess Affordability and Sustainability

Project promoters should verify that projects are financially sustainable and affordable, both during implementation and during operation. In addition, the managerial sustainability of the project when operational needs to be assessed, together with social and environmental sustainability. Each of these aspects is discussed below. In general, the analysis in Step 8 should be taken as applying to the reference project and to project alternatives; however, where the differences between the reference project and alternatives are limited there may be little value to be gained from reworking the assessment for each alternative. Analysts are therefore required to use discretion and to apply the

assessment of affordability and sustainability flexibly so as to highlight difference between alternatives, rather than to confirm similarities.

Carry out financial analysis of the project to determine financial sustainability and profitability[108]

Financial analysis of a public capital investment project is carried out for several reasons:

- To verify that a revenue earning project is financially sustainable and will have sufficient funds to meet its commitments at each stage of its life.
- In the case where a project is not financially sustainable, to identify any changes to tariff regimes or provision of budget subsidies that may be necessary.
- For commercially-oriented public operating entities, to ascertain whether an investment is profitable and thus contributes to improving overall profitability (or reducing losses in the case of entities subsidised from the national budget).
- In the case where a project is potentially profitable, to point towards possible financing modalities, including public-private partnership.

Financial analysis is applicable to revenue earning projects, for example, investment by public sector energy and water utilities or by public transport operators. For non-revenue earning projects, for example in the health, education, justice and roads sectors, a meaningful financial analysis may not be feasible and therefore may not be required . However, some important financial issues should be investigated for non-revenue projects, such as adequacy of recurrent financing during operation and financial management capacities, as well as affordability of capital costs. These are generally the focus of separate budgetary analysis (see below).

Financial analysis looking at the financial performance of the project on its own determines whether the project will contribute to the financial objectives of the operating entity, and whether it is sustainable in its own right over the longer term.

Estimating the financial profitability of an individual project involves looking at the net cash flows and using discounted cash flow analysis. This is the same technique as is illustrated in Table 7 for economic analysis, except that the cash flows recorded will represent the actual financial transactions of the operating entity and not wider economic effects. As with the economic analysis the analysis of an individual project is to be carried out in constant prices. The net cash flow is the difference between annual cash receipts and annual cash payments. It means the actual amount of cash being paid out or received by the project and excluding non-cash accounting items like depreciation. It includes operating and maintenance expenditures and all taxes, both indirect and direct. Cash payments for construction should be reconcilable with the project cost estimates, including physical contingencies when resulting from a systematic risk analysis, but not price contingencies (as the analysis is in constant prices). Financing costs during construction are not included in the project cash flow analysis. Cash flows are considered in the year in which they occur and over the expected useful life of the project.

The cash flow analysis is broken down into net cash flow from operations (operating receipts minus payments resulting from operations, including taxes) and net cash flow including the impact of investment expenditures. The net cash flow from operations discounted at the financial opportunity cost of capital shows the maximum capital that may be invested in the project for it to remain the most

[108] Financial sustainability means that a project's revenues cover its costs and that it will not run out of cash. Financial sustainability is not the same as financial profitability, which is a more demanding standard.

attractive option for the investor. The calculation of the financial opportunity cost of capital can, however, be problematic. More usually the rate of return of the project to the operating entity is estimated using the financial internal rate of return (FIRR), calculated from the forecast net cash flow. If the project's FIRR exceeds the operating entity's weighted average cost of capital (WACC), the project is considered to be financially viable. The weighted average cost of capital represents the cost (in real terms) to the entity of raising capital for the investment and, since this may come from several sources with different costs (for example a blend of loans from different international financial institutions) a weighted average cost may need to be calculated. If the entity receives all its investment capital via the State budget then the cost of capital is equivalent to the central government's cost of borrowing (expressed in real terms). Where the FIRR falls below the weighted average cost of capital (and the project has been shown to be economically viable) some form of government subsidy is indicated. This may come in the form of State budget funding of a portion of investment costs or equity participation of the State in a commercial entity. Raising user charges may also be considered.

Carry out financial analysis of the operating entity to assess its financial sustainability

Financial analysis of the operating entity looks at its financial strength as a whole and at its capacity to meet negative cash flow requirements of the project, if any, and, by inference, the extent and timing of any requirements for subsidies from the State budget.

Usually, a capital investment project will be carried out by an existing entity, which will be performing other on-going operations. In these cases, the financial analysis of the entity as a whole will be relevant to assessing financial sustainability: a profitable project undertaken by a financially weak or failing entity is unlikely to be sustainable. Sometimes a project is carried out in isolation and a new entity created to operate it: in these cases, the two dimensions of financial analysis effectively merge into one.

In assessing the financial sustainability of a commercialised operating entity as a whole, the following financial statements, which are explained in Box 3, will need to be produced:

- Income and expenditure account;
- Balance sheet; and
- Cash flow statement.

Box 3: Financial Statements for a Commercialized Operating Entity

a) Income and expenditure account

This statement records income and expenditure over a year, on an accruals basis. The statement should usually record: volume of sales; operating revenues; operating costs; depreciation; taxes on income; net income; appropriations from net income. Useful ratios for analyzing the income statement are: growth rates gross profit as a percentage of revenues; operating income of net income as a percentage of revenues; and return on average invested capital.

b) Balance sheet

The balance sheet presents a snapshot of the assets and liabilities of the operating entity at a fixed point in time. The main elements are: fixed assets net of accumulated depreciation; intangible assets and long-term investments; current assets and liabilities; long term liabilities; and capital and reserves. Useful ratios for analysing income statement are: growth rates; ability to pay off current liabilities with assets that can be quickly converted to cash or 'quick ratio'; debt as a percentage of total capitalisation; rate of return on net fixed assets in operation; accounts receivable outstanding on a daily basis; inventory outstanding on a daily basis; net tangible assets as a percentage of long-term debt.

c) Cash flow statement

The cash flow statement shows where an operating entity's funds are coming from, how they are used and whether there is sufficient liquidity to enable financial commitments to be met. The main elements are: cash receipts and payments from operations; capital expenditure broken down by total expenditures on assets, financial charges during construction and working capital; borrowings; short-term loans to finance working capital; debt services; equity contributions (from government in the case of state-owned enterprises); and cash balance available. Non-cash accounting items are excluded. Interesting ratios in analysing the cash flow statement are: debt service coverage; growth rates; percentage of capital expenditure financed by internal sources.

Financial statements are usually produced in current prices rather than constant prices. Assumptions about inflation should be clearly stated so the statements can be reconciled against the discounted cash flow analysis of the project, which is in constant prices. The statements should also be forward-looking, capturing forecasts of the future financial position of the operating entity including forecast impact of the proposed project on revenues and costs should be produced. This is usually not done for the entire project life, but for a period of up to five years from the completion of project construction.

On the basis of the analysis above, an assessment of the financial sustainability of the operating entity should look at whether[109]:

- The balance sheet has been correctly organised and properly accounts for current assets, current liabilities, long-term liabilities and capital;
- The balance sheet of the organisations is in a healthy state;

[109] These are the checks recommended in the UK. See 'Public Sector Business Cases Using the Five Case Model: Green Book Supplementary Guidance' HM Treasury, 2013.

- The organisation is solvent;
- The organisation is not over-trading;
- The cash flow of the organisation is sound; and
- Necessary allowance has been made for risk.

Carry Out Budgetary Analysis as an Input to Assessing Affordability

Budgetary analysis must be performed for all projects to determine the net impact on the national budget during implementation and operation, and to assist in establishing whether an investment is affordable from the fiscal perspective. It enables affordability to be assessed in relation to projections of expenditure ceilings and available fiscal space during budget preparation.

The minimum requirements for demonstrating the budgetary impact are shown in Table 9, which identifies total budgetary costs, projected revenues (if any) and the net impact. Costs for budgetary impact analysis must be in current prices, i.e., adjusted for inflation. Economic Entities promoting projects must consult with the Ministry of Finance (Budget Directorate) to obtain forward estimates of inflation. If annual operating and maintenance costs are expected to be very similar the post-implementation analysis period can be truncated and estimated annual averages presented post-Year 7 in Table 9.

Table 9: Summary Budgetary Analysis

	Year 1	**Year 2**	**Year…**	**Year 7**	**Post- Year 7**
Budgetary Costs Capital Costs Net Recurrent Costs* • Operations • Maintenance					
Total Costs					
Projected budgetary revenues (if any)					
Net Budgetary Impact					

*Allowing for any cost savings related to the investment.

For projects expected to be financed from diverse sources outside of national budgetary funding, Table 9 should be completed to supplement Table 8 (and Table 10).

Table 9: Expected Sources of Funding for Project Implementation

	Year 1	Year 2	Year 3	Year 4	Etc.
EU financing passing through national budget					
Budgetary funding					
National private capital					
EIB financing					
Other loans					
Total Sources Expected Funding from All Sources of Finance					

A full budgetary analysis can be employed to estimate the total budgetary impact in present value terms, to establish whether it is overall positive. This is wider in its perspective than the financial analysis (but not as wide as economic analysis) because it takes account of all direct and indirect financial flows that impact on the public finances and not just those that affect the projects operating entity. A full budgetary impact analysis should only be prepared for major projects with significant direct revenue earning potential or substantial tax effects. The Ministry of Finance (Budget Directorate) will advise if this is necessary when giving an opinion on the PCN.

Table 10 is an example of the kind of information that should be included in the full budgetary analysis of a major project. The analysis period is truncated for the sake of space, but should normally extend to the useful life of the project and be the same as that selected for economic and financial analysis. On the basis of the analysis of the information and analysis in Table 10 it can be established whether or not the project has a positive or negative net impact on the public sector finances in present value terms. The net fiscal impacts in each year are expressed in present value terms using a discount factor and are summed to arrive at the net present value of the project for the budget. It should be noted that Table 10 includes estimates of the taxes that will be generated by the project. These can be direct or indirect tax effects, but it can be difficult to estimate the latter, so a cautious approach is recommended and only incremental tax revenues that would not have occurred without the project should be considered.

Table 10: Format for Public Sector Budgetary Analysis – Net Cash Flow Analysis

	2016	2017	2018	2019	Etc.
Revenue from charges					
Residual value					
Total Inflows					
Budget subsidies/grants					
Operating costs					
Investment costs					
Decommissioning costs					
Total Outflows					
Indirect taxes (e.g., vehicle registration, customs & excise)					
Direct taxes (e.g., personal income tax, corporation tax)					
Total Tax Impact					
Total Other Flows					
Net Cash Flow for Public Finances					
Discounted Net Cash Flow					

Source: Public Spending Code, Department of Public Expenditure and Reform, Ireland
http://publicspendingcode.per.gov.ie/carrying-out-a-financial-analysis/

Assess institutional/managerial sustainability of the project

Efficient project implementation requires there to be a capable organisation, with adequate internal arrangements, that is responsible for:

- Managing the different phases of the proposed project, identifying issues that need to be resolved and ensuring their resolution;
- Ensuring that the required approvals and direction are obtained at each stage;
- Ensuring a proper flow of information between stakeholders; and
- Making sure necessary policies and procedures are followed.

The project appraisal should include an assessment of the adequacy and sustainability of proposed implementation and operational arrangements for the proposed project. This should include an assessment of the capacities of the organisation(s) responsible for implementing and operating the project, indicating any strengthening measures which will be required before construction or operation commence. The project appraisal therefore needs to include the following elements:

- An assessment of the capabilities of the organisation(s) responsible for implementing and/or operating the project, especially the adequacy of human resources to meet the estimated needs during implementation and operation, identifying any constraints and proposing capacity building measures, where required.
- Development of an outline plan and timetable for implementing the project, indicating key milestones in detailed planning, approval and construction. This should include the steps from approval of the feasibility study to commencement of construction, i.e., detailed design, preparation of tender documents, procurement arrangements, environmental and spatial planning approvals, and land acquisition.
- Planning for the project management arrangements, including the organisational arrangements and the allocation of responsibilities between the different parties involved. If any part of project management is to be handled externally to the organisation promoting the project this should be indicated.
- Assessment of the outline organisational arrangements and of the allocation of responsibilities for operating and maintaining the project once completed, including an assessment of the capabilities of the responsible organisation.

Assess environmental and social sustainability of the project

Infrastructure projects frequently have environmental and social impacts arising from construction and operation which, if significant enough, could threaten long-run sustainability. Beyond financial, budgetary and managerial sustainability, decision-makers therefore need to be provided with adequate evidence on the environmental and social sustainability of a project and made aware of any significant risks which could threaten sustainability.

Environmental and social costs and benefits should, to the extent possible, already be accounted for in monetary terms at Steps 4-5, Economic Analysis[110], and included in the aggregate measure of economic viability. Where this is not the case, non-monetised costs and benefits should nevertheless be identified and their relative importance assessed at Step 8 of Project Appraisal. Environmental and social impacts, on the other hand, are effects of the project, usually negative but sometimes positive, that have a significance beyond that which can be captured in aggregate measures of economic viability. Because of political, social or legal constraints or long-term environmental concerns, certain effects will put into question long-run sustainability if they exceed, or risk exceeding, explicitly defined limits or implicit tolerances, even if a project is shown to be economically viable overall. Decision-makers must then balance these broader sustainability issues against economic viability considerations. Purists might maintain that all effects should be captured in economic cost-benefit analysis, but in practice this is difficult and it is better to be open and transparent about the treatment

[110] Significant environmental and social benefits and costs should be accounted for in monetary terms in the economic cost-benefit analysis where feasible. Approaches for valuing environmental and social benefits and costs are discussed under Step 5. Figure 2 in particular gives a schematic representation of the choice of valuation method. Where valuation in monetary terms is not possible, costs and benefits should at least be identified in quantitative or qualitative terms and their relative importance compared to monetized benefits and costs assessed. In this case, 'quantitative' means a numerical indication of the scale of environmental and social benefits and costs, such as quantified levels of CO2, pollution in terms of PPM, number of households affected by increased noise and by how much (decibels), etc.

of any sensitive environmental and social concerns, which may not be adequately taken into account at Steps 4-5 (while attempting to make the economic analysis as comprehensive as possible).

Bearing in mind the limitations of economic analysis, Project Appraisal also requires a wider perspective which examines the implications of unbalanced impacts for the sustainability of the project. If, for example, a certain group(s) of stakeholders (e.g., a region or an income group) is negatively affected disproportionately and cannot be compensated commensurately, this could damage the acceptability of the project from a social perspective, which would not be picked up in the economic cost-benefit analysis. Social impact assessment therefore involves identifying stakeholder groups that are likely to experience major welfare losses (or gains) due to the project. Similarly, localized environmental impacts may exceed statutory limits or acceptable tolerances for specific eco-systems or certain stakeholders, and environmental impact assessment involves identifying these cases.

Depending on the scale and nature of the project, and the likely importance of these effects, a formal environmental impact assessment and/or social impact assessment may be necessary[111]. In certain cases, an environmental impact assessment will be required by law[112]. Such assessments should satisfy both the need to identify and account for environmental and social costs and benefits in the economic analysis, as well as addressing sustainability issues outlined above. Box 4 below summarizes the conduct and content of environmental and social impact assessments, which can often be combined. Preliminary assessments[113] will need to be conducted early in the Appraisal Stage and prior to completion of the feasibility study so that the findings can be incorporated in the quantified economic analysis and broader feasibility assessment.

The current manual is not intended to provide comprehensive guidance on conducting environmental and social impact assessments. Economic Entities promoting projects are advised to draw on external expertise to carry out such assessments where they are required by law or are indicated because of an expectation of significant impacts. In particular, the Department of Environment of the Ministry of Agriculture, Rural Development and Environment has well developed capacities in environmental impact assessment and should be consulted where necessary.

Environmental and social impacts should be explored in depth in the Feasibility Study and summarised for decision-makers in a format similar to Table 11, adjusted as appropriate for sector specificities.

[111] The PCN should have highlighted requirements for impact assessments (under Approach to Further Studies), but these should be reconfirmed at project appraisal stage.

[112] Assessment of Impact on the Environment from Certain Projects Law of 2005 (No.140(I)/2005), Assessment of Impact on the Environment from Certain Plans and/or Programmes Law (No.102(I)/2005) and international legislation, including EU regulatory framework and standards.

[113] Assessments will need to be finalised when the detailed design of the project is completed following a positive appraisal decision.

Table 11: Summary of Environmental and Social Impacts

Area of Impact	Direct Impact or Risk (quantified where possible)	Proposed Mitigation or Enhancement* Measures (if any)	Residual Impact/ Risk or Enhanced Impact
Environmental			
Air emissions and air quality			
Energy use and conservation			
Wastewater and water quality			
Water use and conservation			
Use of hazardous materials			
Waste production/management/treatment			
Land contamination/land use, soil sealing			
Biodiversity and natural resources/possible impacts on Natura 2000 sites and other protected areas			
Noise impacts/vibrations			
Climate Change (mitigation/adaptation) impacts			
Possible direct/indirect, cumulative/short-term, long-term impacts			
Social			
Labour and working conditions			
Occupational health and safety			
Community health, safety and security			
Land acquisition and involuntary resettlement			
Gender			
Minority groups			
Poverty impact			
Regional/local economic development			
Cultural heritage			

* Some social impacts, like job creation, may be considered positively and measures to enhance the impact may be considered.

Any licenses and permits required by the project in relation to environmental issues should be identified at Step 8, along with the procedures and timetable for obtaining these. This process must be factored into the project implementation plan. If environmental monitoring is a requirement on project completion, the arrangements for doing this must also be described.

Box 4: Performing Environmental and Social Impact Assessments

An environmental impact assessment (EIA) is a formal planning tool to assess a project's potential negative and positive consequences on the human and natural environment and to identify possible mitigation measures or project design improvements to reduce negative impacts. A preliminary EIA should be carried out near the beginning of project preparation to ensure that potential problems are foreseen and addressed at an early stage in the project's planning and design. The EIA looks at the impact in the project area and in associated areas, such as downstream, groundwater and ambient air. It examines effects on environmental resources, e.g., biodiversity, from land-use changes and pollutants caused by the project. The assessment may need to be supported by a mitigation plan and an environmental monitoring plan.

The main steps in performing an EIA are:

- Screening: to determine if a project requires an environmental impact assessment;
- Scoping: to identify potential impacts and legal requirements; identification of alternative solutions; preparation of terms of reference;
- Assessment and evaluation of impacts and development of alternatives;
- Design of monitoring, compliance, enforcement and auditing arrangements;
- Reporting the environmental impact statement, including non-technical summary for a general audience;
- Review of environmental impact statement, including public consultation; and
- Decision-making/authorisation concerning the acceptability of the environmental impacts.

The minimum reporting requirements for the coverage of an EIA consist of:

- Description of the activity and the potentially affected environment;
- Description of alternatives;
- Assessment of likely or potential impacts of the activity and alternatives (direct, indirect, cumulative, short-term and long-term effects);
- Identification and assessment of mitigation measures;
- Identification of gaps in knowledge and uncertainties; and
- Non-technical summary for decision-makers.
- Public consultation

A social impact assessment (SIA) is an assessment of a project's potential social consequences. Its focus is on where benefits and costs fall and not so much on the identification and valuation of these impacts, which are the subject of economic analysis. An SIA will therefore focus on impacts on income distribution - both between income levels and between geographic areas - on poverty, on unemployment, on gender equality and on minorities.

Step 9: Identify the Preferred Project Alternative and Make Recommendations to Decision-Makers

Step 9 involves identifying the preferred alternative on the basis of a comprehensive appraisal of all factors and arriving at a decision on whether or not to proceed with a project proposal. This decision must be based on a balanced evaluation of the findings of the analyses performed in Steps1 to 8.

In addition to quantitative economic analysis, the determination of the economic viability of a project should also consider intangible benefits and costs that cannot be monetised. The social impact of the project, i.e., where the costs and benefits fall, also needs to be considered. The sustainability of the project from a number of different perspectives, both during implementation and during operation, also needs to be confirmed. These elements of project appraisal are addressed in Step 8 and Step 9.

Identify Preferred Project Alternative on the Basis of Quantitative Economic Analysis

Project promoters should decide, on the basis of the quantitative economic analysis carried out in Step 7, whether the project as conceived is preferred over the alternatives considered including doing nothing. In making this decision, the robustness of the quantitative economic analysis should be taken into account. The decision on economic viability should be made on the basis of the expected NPV determined through a probabilistic analysis. Where this cannot be done, either because of absence of data (or valid approximations) on the probabilities of key outcomes or because the research effort is not justified, the findings of sensitivity analysis should be taken into consideration when confirming that the economic case remains robust.

In the case of projects subject to cost-effectiveness analysis, the decision should be made based on which of the project alternatives is likely to be the most efficient, i.e., delivers a unit of output at lowest expected cost. Where possible, this decision should be made on the basis of expected net present cost, with the robustness of cost estimates being subject to sensitivity analysis concerning key parameters where this is not possible.

If the quantitative economic analysis indicates that one of the project alternatives is more attractive than the reference project, then project promoters should consider investigating this alternative in more depth, if it represents a significant departure from the project as originally foreseen. This may require further studies to be carried out and a new project appraisal. Thorough investigation of project alternatives involving variations in timing, technical specification, capacities and location should be encompassed within the initial project appraisal and would not normally be expected to require further studies if a variant should prove more attractive than the initially preferred project.

Take into Account Non-Monetised Benefits and Costs and Affordability and Sustainability

The comprehensive appraisal performed as part of Step 9 involves taking into account the affordability and sustainability factors analysed in Step 8 and assessing the importance of any significant intangible benefits and costs which it was not feasible to monetise in Step 7.

The preferred alternative on the basis of the earlier quantitative economic analysis may turn out to be doing nothing. Other things being equal, this would indicate that the project is not economically viable; however, if non-monetary benefits are significant this finding may be overturned, provided there is strong and well-argued justification. A qualitative assessment of the importance of these benefits is therefore required as a basis for reaching a decision. Equally, a positive economic case for a project based on quantitative economic analysis may still be overturned if non-monetised costs (negative externalities) are demonstrated to be unacceptable or if there are unacceptable concerns about a project's environmental or social sustainability. For projects where no monetary benefits have

been estimated and CEA has been used, the decision to proceed must be made entirely on the basis of a qualitative assessment of benefits[114].

If the project is revealed to be financially unsustainable or unaffordable within current budgetary allocations, then it may not proceed in the form foreseen. Either further development of the project should be halted, or ways of reducing costs, such as phasing or reducing the specification, must be considered. Project promoters should be ready to perform a number of iterations of the project appraisal process, including introducing new project alternatives/variants, to find an affordable solution if this is necessary.

Different approaches to comprehensive appraisal are adopted depending on whether the NPV has been calculated for the project or not. These are set out below.

Comprehensive appraisal of projects for which it has been possible to estimate NPV

A 2-stage appraisal process is recommended for a project for which it has been possible to estimate the NPV:

1) Take a position on the economic viability of the project according to quantified economic analysis; and
2) Adjust this position depending on the significance of the affordability and sustainability factors addressed in Step 8 and taking into account the relative importance of benefits and costs that have not been captured in Step 5.

Findings and recommendations of the above analysis should be presented in a Project Appraisal Summary table as an aid to making an informed judgement. The table is also an important tool for presenting the basis for recommendations to decision-makers. The table lists all the relevant project impacts and records quantitative and/or qualitative findings against each in summary form[115]. The specific factors to be taken into account will be particular to a sector, so it is not possible to define a unified template for all sectors. Table 12 gives an example of a summary table for a road sector project in the UK Department of Transport. It looks at various project impacts grouped by 'Economy', 'Environmental', 'Social', and 'Public Accounts', which groupings will be common to all projects For some of the impacts, there will be quantitative information, whereas for others there will be a qualitative assessment. A 7–point scale from 'beneficial to adverse'[116] is used for qualitative assessment of impacts. The same scale is used to assess the distributional impact on vulnerable groups in society (the last column). Depending on where the differences between alternatives lie, it may be necessary to produce the summary table for each alternative to facilitate appraisal. This will not be necessary if most of the differences between alternatives have been captured in the NPV and alternatives are very similar in other respects.

As indicated by good practice, no attempt is made to come up with an overall score for the project or project alternatives on the basis of an additive scoring system for each impact. The recommendation on whether to proceed with a project is based on the best judgement of the assessors[117], weighing up

[114] There will also be cases where a policy decision has already been taken and the Project Appraisal is just concerned with finding the least costly way of implementing this decision.
[115] In effect, the Project Appraisal summary table is a multi-criteria analysis, as described below, without the scoring.
[116] Beneficial/moderately beneficial/slightly beneficial/neutral/slightly adverse/moderately adverse/adverse.
[117] As it is when a scoring system is used: the scoring system just provides a more structured framework for the exercise of judgement.

the case based on the NPV against their assessment of the relative strength of the other factors, while giving precedence to NPV as the deciding criterion.

The recommendation should be made based upon the findings with respect to economic viability combined with the findings on sustainability and non-monetised effects. When the findings from the economic analysis (1 above) and from sustainability/intangibles analysis (2 above) all point in the same direction the recommendation can be safely presented. If the affordability and sustainability analyses and economic analysis point in different directions, then the final recommendation must be carefully presented giving a full explanation of the reasoning and the relative weights given to the different factors in arriving at the final conclusion. A presumption in favour of NPV as the deciding criterion is integral to the Manual and any decision which goes in the opposite direction on the basis of non-monetised costs and benefits or sustainability concerns should be carefully explained, recording explicitly all the factors leading to the NPV result being over-ruled.

Table 12: Project Appraisal Summary Table for a Road Project (Source: UK Department of Transport)

Appraisal Summary Table		Date produced:				Contact:	
Name of scheme:						Name	
Description of scheme:						Organisation	
						Role	Promoter/Official

Impacts		Summary of key impacts	Assessment				
			Quantitative			Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ vulnerable grp
Economy	Business users & transport providers		Value of journey time changes(£)					
			Net journey time changes (£)					
			0 to 2min	2 to 5min	> 5min			
	Reliability impact on Business users							
	Regeneration							
	Wider Impacts							
Environmental	Noise							
	Air Quality							
	Greenhouse gases		Change in non-traded carbon over 60y (CO2e)					
			Change in traded carbon over 60y (CO2e)					
	Landscape							
	Tow nscape							
	Historic Environment							
	Biodiversity							
	Water Environment							
Social	Commuting and Other users		Value of journey time changes(£)					
			Net journey time changes (£)					
			0 to 2min	2 to 5min	> 5min			
	Reliability impact on Commuting and Other users							
	Physical activity							
	Journey quality							
	Accidents							
	Security							
	Access to services							
	Affordability							
	Severance							
	Option and non-use values							
Public Accounts	Cost to Broad Transport Budget							
	Indirect Tax Revenues							

Comprehensive appraisal of projects for which it has not been possible to estimate NPV

Where it has not been possible to estimate an NPV and CEA has therefore been performed, project assessors may still use a project appraisal summary table to organise their comprehensive appraisal of the various impacts and arrive at a judgement on the preferred project. Alternatively, it is possible to apply a more structured approach, known as multi-criteria analysis (MCA), to assessing the effects of the project and then comparing the results to the costs evaluated through CEA. MCA results can then be presented in the appraisal summary table alongside the life-cycle costs of the project (NPC) and other factors not incorporated in the MCA.

MCA is a useful tool for organising the assessment of the various factors impacting on project performance in a more systematic way to arrive at a subjective judgement on the project alternative that has the most merit. Using MCA, the importance of multiple non-monetised benefits and costs and of environmental and social sustainability factors can be assessed qualitatively for the different project alternatives. It involves identifying the criteria - project effects - that are judged to be the most important for decision-making and making a structured assessment of their individual and relative importance, using an agreed scoring and weighting system to arrive at an aggregate score for each project alternative[118]. Project alternatives are then ranked on the basis of their scores to find the preferred one. In the end, the process of identifying critical factors, agreeing weights, deciding on scores and reaching consensus can be as important as the end result. More formally, MCA involves:

- Identifying (generally non-monetised) project effects that are judged important enough to be decision criteria.
- Scoring project alternatives against these criteria - using quantitative measures of effects upon which to base scores wherever possible.
- Determining weights reflecting the relative importance of the criteria
- Combining the weights and scores for each of the alternatives to derive an overall value - multiplying the value score on each criteria by the weight of that criterion, and then adding all the weighted scores together.
- Comparing the weighted, aggregate scores of each project alternative so derived to determine the preferred alternative.
- Performing a sensitivity analysis to test the sensitivity of the results to changes in the scores and weights.

Table 13 below gives an example of a simple performance matrix for a formal MCA of two project alternatives. In this case there are three criteria against which the projects are assessed and Project B is found to be the preferred alternative on the basis of the weighted total impact. The analysis can be extended to multiple projects or project alternatives. Different and more criteria can be added, including criteria relating to technical performance or quality of service delivery.

Table 13: Simple Example of a Multi-Criteria Analysis of 2 Projects Alternatives

[118] A less formalized multi-criteria analysis simply involves: listing important project effects; wherever possible quantifying these (normally in measures other than money, since the analysis generally deals with effects that cannot be monetized); making a qualitative assessment of their importance; and taking them into account when reaching a decision on the feasibility of the project. This is the approach behind the Project Appraisal summary form.

Criteria[119]	Score	Weight	Impact
Project A			
Impact on poverty	2	0.6	1.2
Impact on business investment	1	0.2	0.2
Impact on environmental quality	4	0.2	0.8
Weighted total impact			2.2
Project B			
Impact on poverty	4	0.6	2.4
Impact on business investment	1	0.2	0.2
Impact on environmental quality	2	0.2	0.4
Weighted total impact			3.0

Use of weighted average scores as in the example above depends on the assumption of mutual independence of preferences, meaning that the assessed score given for one criterion needs to be independent of the score given to another. If this is not the case, there is a risk of double-counting of effects, and this should be avoided. Scoring and weighting inevitably involves the exercise of subjective judgement, but should be organised in such a way as to limit the degree of subjectivity. To this end, wherever possible, scores should be linked to quantitative measures of the criteria.

The final recommendation on the preferred alternative requires balancing the results of the MCA against the costs estimated through the CEA. Necessarily this involves the exercise of a judgement concerning the scale of benefits versus the costs. The starting point in making a decision between alternatives should be to lean towards the least cost alternative[120] and then to carefully justify any departure from this indicator on the basis of the results of the MCA and any sustainability factors not captured in the MCA. Such departures are likely to be more frequent than departures from the NPV criterion (as described above), but it is good discipline to at least begin from a presumption that costs should be minimised.

In the case of projects that fulfil policy commitments and where the benefits of different alternatives are the same or broadly similar, the decision on the preferred alternative should be made on the basis of the lowest NPC estimated through CEA.

Arrive at a final decision for presenting recommendations on the project

At the end of the project appraisal, before presenting recommendations, project promoters must assure themselves that the proposed project meets the following criteria:

[119] These criteria are given as example only. Criteria will need to be determined for individual projects in consultation with stakeholders and experts.
[120] Discounted life-cycle costs not undiscounted capital costs.

- The project logic is convincing and the strategic 'fit', meaning its consistency with the Government's medium to long term strategic objectives, is reconfirmed.
- The engineering/technical feasibility of the project has been validated and realistic cost estimates prepared.
- Realistic estimates of the demand for the public services delivered by the project have been prepared.
- The economic viability of the project has been confirmed with reasonable certainty, meaning that the net benefits are expected to be positive, there are no better ways of achieving the project purpose and the public financial resources employed in the project are unlikely to be employed better elsewhere.
- The project has been shown to be affordable, meaning that all funding sources are assured, and it will be financially and fiscally sustainable once operating.
- Environmental and social impacts are acceptable or, where negative impacts are foreseen, adequate mitigation measures are proposed.
- Satisfactory project management arrangements will be put in place for delivering the project to specification, on time and to budget.
- Organizational arrangements for operation of the project will adequate for the sustainable delivery of the proposed services.
- Implementation and operational risks have been assessed and necessary mitigation measures foreseen for the most significant risks.
- The proposed approach to procurement has been designed to secure best value for public money and the key contractual issues have been clearly identified.
- Appropriate indicators of project progress and performance have been defined and suitable monitoring and evaluation arrangements designed.

These are the same high-level criteria that the DG EPCD will employ when reviewing projects. The more detailed criteria to be used by the DG EPCD are set out in Annex 4 and project promoters should pay careful attention to these when presenting the project appraisal.

Deliverables from project appraisal

A feasibility study is the core analytical document for project appraisal. This must be supported by technical studies and impact assessments (usually annexed to the feasibility study). As indicated in the Public Investment Management Guidelines, a feasibility study must be prepared for all financially significant projects. A template for the outline of feasibility study is presented as Annex 5 to the Manual.

A feasibility study is too detailed a document for decision-makers. As indicated in the Public Investment Management Guidelines a high-level Project Appraisal Report must also be prepared. This will be based on the executive summary of the feasibility study and must be responsive to the criteria listed above. The Project Appraisal Report must contain a clear and recommendation on whether to proceed, justified on the basis of the feasibility study findings as summarised in the appraisal summary table. A template for a Project Appraisal Report is presented as Annex 6 to the Manual.

Economic Entities can submit their completed Project Appraisal Reports (including Feasibility Studies) to DG EPCD at any time following the pre-selection of the project. Raw data and worksheets

(excel files etc) used to calculate the various parameters of the Feasibility Study, must be submitted in electronic form, in order to enable the review of assumptions and calculations by the DG EPCD. The DG EPCD and the MoF BD will complete the review of the Project Appraisal Report in time for Economic Entities to include projects that have passed the appraisal stage successfully as a new policy proposal in the Reconciliation Process. No new Project Appraisal Reports can be considered during the Reconciliation Process.

Step 9A: Methodology for Assessing the Rationale for PPP

Introduction

At the Project Appraisal stage, all projects should follow the nine steps set out in detail above, regardless of whether they are flagged as potential PPPs. A project not flagged as a potential PPP during the Pre-Selection stage, may nevertheless be flagged as such at the Project Appraisal stage, if it presents significant PPP potential during the detailed assessment of the project's costs and benefits (Steps 4 and 5). Step 9A of the process examines the rationale for flagging a project as a potential PPP. It is performed for those projects with PPP potential, whether this is identified at Pre-Selection or Appraisal stage. It is only performed for those projects with PPP potential that have been appraised positively after following the previous 9 steps. Those projects for which the rationale for PPP is assessed to be solid, will go forward to the value for money assessment detailed in Part IV of the Manual.

Methodology for Assessing the Rationale for PPP

A. Issues to Consider when Flagging a Project for PPP

The rationale for flagging a project as a potential PPP (e.g. higher efficiency in the delivery of public service; innovation in project design; effectiveness in project implementation; public service reform) should address the following three considerations:

- Value for money proposition for the potential PPP: Section 3 of the Public Investment Guidelines states that the "major purpose of project appraisal is to improve value for money". A public investment project should not be flagged as a potential PPP simply because of the need for leveraging public investment with private capital. Value for money in the use of private capital for building and operating public capital investment requires obtaining efficiency savings that more than compensate for the unavoidable additional financing cost brought by private capital compared to public capital.

- Institutional capacity for procuring and managing PPP contracts: The existence of institutional capacity for managing the PPP process, namely the procurement stage and the long-term relationship with the private partner over the life of the PPP contract, is critical for success. PPPs also require extensive contract management over the long-term. A key consideration should therefore be the capacity of the relevant procuring authorities to monitor and manage the contracts in order to ensure value for money.

- Institutional justification for any long-term constraints on foreseeable future changes to public policy: PPPs always bring some long-term constraints on public policies, constraints that need to be recognized and accepted by the Economic Entities in charge of the project. For instance, for PPP roads where the concessionaire is paid by the users, typically the contract defines constraints on the opening of new alternative roads in the vicinity. In the Project Appraisal stage these constraints will be identified and during detailed preparation, prior to physical implementation, they will be assessed and minimized.

B. Possible Drivers

The rationale for PPP procurement is presented through the identification of possible drivers of value for money. A project should be considered for PPP only if one or more possible drivers are met. Table 14 below summarizes the possible drivers and the related questions for guiding the choice of PPP structure. The most common drivers whose existence must be considered are listed below.

- PPP would result in more effective management. Projects managed as PPPs would deliver the capital investment and associated services more quickly, with a higher quality, and/or more cost-efficiently than the alternative. PPPs typically bring in experience and expertise not available in the public sector, and/or strengthen managerial incentives by linking payments to performance. PPPs may also reduce rent-seeking in government-owned enterprises. This driver is more relevant for projects where there is currently under-performance in the sector and/or significant delivery capacity constraints in the public sector that could not be readily overcome internally. It may also apply to projects where there is significant scope to improve quality or reduce overall project cost and risk through management improvements (e.g., projects with some degree of managerial complexity). Factors to be considered while evaluating this driver include the possibility of defining clear, fair, and contractible performance indicators and performance levels, and linking payments to measured performance. These performance indicators should: i) be presented clearly in terms of outputs, avoiding reliance on process- or input-dependent concepts, and in a language that avoids ambiguity; ii) not create (or be perceived as creating) any kind of perverse incentive against users (for instance, avoiding the creation of situations where improving project performance may hurt the welfare of users, such as when the focus on meeting financial goals may lead to PPP-hospital patients being denied best possible treatment); and iii) be, not only measurable, but also measurable beyond reasonable doubt (for instance, a reference to 'clean pavement', if used, should be translated into something measurable). At this stage, performance indicators (and their reference levels) do not have to be very well defined, but Economic Entities should define them broadly and explain how they intend to link the PPP operator's revenue to measured performance, in order to provide adequate incentives for effectiveness and efficiency.
- When applying the whole-of-life costing approach[121], undertaking the project as a PPP would lower its lifetime cost. PPPs integrate up-front design and construction with ongoing operations and maintenance under the responsibility of one company. This creates an incentive to carry out each function in a way that minimizes the total lifetime project cost.
- Private management under a PPP would allow for innovation in capital investment service delivery, resulting in higher quality and/or lower cost. Specifying required outputs rather than inputs in a PPP contract provides scope and incentives for innovation. Consequently, an important consideration is the ability to define performance in terms of outputs.
- PPP would lead to a reduction in public liabilities and fiscal risk compared to public financing and provision. By requiring the private company to raise the finance for a PPP project, and bear substantial risks, a good PPP contract can reduce the public liabilities and fiscal risk

[121] A whole-life costing approach, or life-cycle approach, requires the consideration of project costs (or costs and benefits) over an extended period, allowing for the optimization of the trade-offs between initial investment and operational expenditures. PPPs, involving the commitment of a private entity for managing a project over a long period, typically induce the private partner to apply a whole-life costing approach.

associated with providing the capital investment. The extent to which public liabilities and fiscal risk are contained depends on the structure of the PPP project. While all PPPs reduce fiscal risk to some extent by transferring project risks to the private company, PPPs typically also create liabilities, which may be harder to assess than those associated with a traditional capital investment procurement funded from public debt; hence, this potential benefit should be treated with caution.

- PPP would increase revenues available for funding capital investment and services compared to public financing and provision. Where a project involves charging users for services, this may be done more effectively or more easily with private operation under a PPP than by the public sector. Private operators may find other ways to grow revenues from under-utilized public assets by undertaking investment that broadens possible uses. This could apply to projects that involve charging users for services where there is reason to believe that this will be more efficient under a PPP arrangement (e.g. there is substantial scope to reduce commercial losses) and/or projects involving creating assets that could be used to generate significant revenues from alternative uses in addition to the core project purpose.

Table 14: Summary of Possible Drivers and PPP Structure Questions

Possible Driver	Why might this apply?	When might it apply?	PPP Structure Questions
More effective management under a PPP delivers the capital investment asset and associated services more quickly, to higher quality, and/or more cost-efficiently than the alternative	PPPs may bring in experience and expertise not available in the public sector, and/or strengthen managerial incentives by linking payments to performance. PPPs may reduce rent-seeking in SOEs, and avoid cronyism	May apply to projects where there is: • Current sector under-performance and/or significant delivery capacity constraints in the public sector that could not readily be overcome internally; • Significant scope to improve quality or lower overall project cost and risk through management improvements	• Can payments be linked to performance? • Can sufficient private capital be involved to ensure the private party faces a strong incentive to perform over the long term? • Can project risks reasonably be defined, identified, and measured, such that the right risks can be transferred to the private party?
A whole-of-life costing approach is expected to lower the lifetime cost of the project	PPPs integrate up-front design and construction with ongoing operations and maintenance under the responsibility of one company. This creates an incentive to carry out each function in a way that minimizes total lifetime project cost	May apply to projects for which O&M costs are expected to vary significantly with design and quality of construction	• Can sufficient private capital be involved to ensure the private party faces a strong incentive to perform over the long term?
Private management under a PPP is expected to allow for innovation in capital investment service delivery,	Specifying required outputs rather than inputs in a PPP contract provides scope and incentives for innovation	May apply to more complex projects or those with a range of possible delivery technologies	• Can performance be specified in terms of outputs?

resulting in higher quality and/or lower cost			
PPP will lead to reduced public liabilities and fiscal risk compared to public financing and provision.	By requiring the private company to raise the finance for a PPP project, and bear substantial risks, a good PPP contract *can* reduce the public liabilities and fiscal risk associated with providing the capital investment. The extent depends on the structure of the PPP project.	While all PPPs reduce fiscal risk to some extent by transferring project risks to the private company, PPPs typically also *create* liabilities, which may be harder to assess than those associated with traditional capital investment procurement funded from public debt; Hence, this potential benefit should be treated with caution.	• Can sufficient private capital be involved?
PPPs may increase revenues available for funding capital investment and services.	Private operation may be more effective in charging users for services.	May apply when there is substantial scope to reduce commercial losses or significant revenues can be generated from alternative uses in addition to the core project purpose	• Can revenue risk (demand and payment risk) be transferred to the private sector?

C. Screening Questions

Once the rationale for PPP is confirmed, i.e., one or more of the above drivers has been shown to be met, a project should be considered for PPP only if the answer to all the screening questions below is affirmative.

- Does the project include a significant capital investment component?

  PPPs make sense for projects that involve significant capital investment in infrastructure or physical assets, as this type of investment will create both the opportunity for introducing benefits and the incentive for introducing them, through the link between cost recovery and performance. This need for significant private capital implies that PPP contracting is best suited for projects involving construction or major renewal of fixed assets where capital expenditure constitutes most of the cost of the project. Projects with high capital investments (as a proportion of total costs) and with large operating expenditures may also be considered as significant capital investment, for example, when operating expenditures for a hospital are added to the design, construction and maintenance of a PPP-hospital. In general, when there is no significant capital investment, the use of short- or medium-term management contracts is to be preferred over long-term PPP contracts.

- Is the investment value sufficient to justify PPP transaction costs?

  The cost of preparing and managing a PPP contract can be significant for both public and private parties. This cost may not be justified for small projects. Factors to consider while evaluating this screening question include the degree of standardization of the contract and

the replicability of the project (such that initial transaction costs may be shared over subsequent projects).[122]

- Does the project address a long-term, predictable public service need?

  The long-term nature of PPP contracts reduces the flexibility of the Government to adjust output specifications over time; hence PPPs should be used for assets and services for which needs are expected to be relatively predictable (while also building in mechanisms for dealing with change). Demand may change over time due to changes in preferences or due to population change, and technological change may divert demand to other projects. For instance, for projects delivering services that are subject to significant technological change (such as in projects using information technology), the appropriate choice of technology may be less predictable over the long term and so may not be best suited for PPPs. Projects such as the renewal of water provision systems, or the upgrade of a highway, allow for a reasonable forecast of minimum levels of demand and use reasonably stable technologies. Since PPPs lock in a solution over the long term, they should be used in cases where the proposed solution will remain the best way of addressing the identified need over the project lifetime, with low risk of technological obsolescence.

- Is the sector-level policy and legal environment adequate to support the PPP?

  For a PPP to be feasible, sector policy and legislation must at a minimum allow for PPP procurement of the asset and services in question. This should either already be the case, *or* be reasonably achievable by adapting existing law as part of the project development. For instance, constraints may include sectoral legislation that prescribes public management for specific types of projects, or gives state-owned enterprises some rights on the development and operation of certain types of projects. There may also be restrictions on the expropriation of private land and assets where private interests may benefit. In other cases, the implementation of some PPPs may require the creation of new institutions, such as independent regulators, or changes to the legal rights and responsibilities of existing institutions.

- Is there sufficient institutional capacity in the public sector to successfully implement the PPP?

  Developing, implementing, and managing a PPP over time requires substantial dedication of capacity and some expertise on the part of the public sector counterpart. "Sufficient" capacity depends on the complexity of the project as well as the institutional arrangements for PPP put in place by the government, but in general requires that:

  - Adequate capacity exists within the implementing agency to develop and implement the PPP project, and/or centralized PPP capacity is available to support project implementation;
  - Resources have been allocated for the external support needed to ensure high-quality project preparation and implementation; and

[122] For these reasons, some countries do not allow for the creation of PPPs with a volume of investment below a certain value of around Euro 20 million. However, a flexible approach, considering the specificity of each case, is preferred to a system-wide minimum investment value.

- Capacity exists, could reasonably be developed, or could be contracted in to manage the PPP contract over its lifetime, this includes capacity to manage the legal dimensions of contract management and dispute resolution.

- Could the PPP generate private sector interest?

  Private sector interest ultimately comes down to being able to make a reasonable return — sufficient to compensate for the risk involved and comparable to other investments of similar risk — in an environment where the rules are clear and stable. The level of private sector interest in the project will primarily depend on the PPP structure. This will be tested later during detailed project preparation prior to physical implementation. However, at the Project Appraisal stage some supporting evidence can be gathered as to: i) whether a PPP could generate private sector interest; ii) the definition of the private operator's rights and responsibilities, including its scope for managing the project as per business and contractual requirements and to develop additional commercial activities that would also serve users and bring value to the project; and iii) the existence of or need to create public sector institutional mechanisms for managing the contract. On this basis, the appraisal documentation should present a clear picture of why this project would generate enough private sector interest to warrant market consultation.

The PPP screening questions, with further explanations, are summarized in Table 15.

Table 15: Summary of Screening Questions for PPP

Screening Question	Explanation and Suggested Approach
Does the project include a significant capital investment component?	PPPs make sense for projects that involve substantial capital investment in infrastructure or physical assets, which would then benefit from the effective management of risks associated with construction and delivery. This may be a single major project or a series of replicable smaller projects in a given sector.
Is the investment value sufficient to justify PPP transaction costs?	The cost of preparing and managing a PPP contract can be significant for both public and private parties; this cost may not be justified for small projects.
Does the project address a long-term, predictable public service need?	The long-term nature of PPP contracts reduces the flexibility of the government to adjust output specifications over time; hence PPPs should be used for assets and services for which needs are expected to be relatively predictable.
Is the sector-level policy, legal, and regulatory environment adequate for this PPP?	For a PPP to be feasible, sector policy, legislation, and regulations must at a minimum allow for PPP for the asset and service in question. This should either already be the case, *or* be reasonably achievable by adapting existing law or regulations as part of the project development.
Is there sufficient institutional capacity in the public sector to successfully implement the PPP?	Developing, implementing, and managing a PPP over time requires substantial dedication of capacity and some expertise on the part of the public sector counterpart. "Sufficient" capacity depends on the complexity of the project as well as the institutional arrangements of the government in question for PPP.
Could the PPP generate private sector interest?	The level of private sector interest in the project will primarily depend on the PPP structure, and hence will be tested during the detailed project preparation process. However, some evidence can be gathered to give an initial reading as to whether a PPP might generate private sector interest.

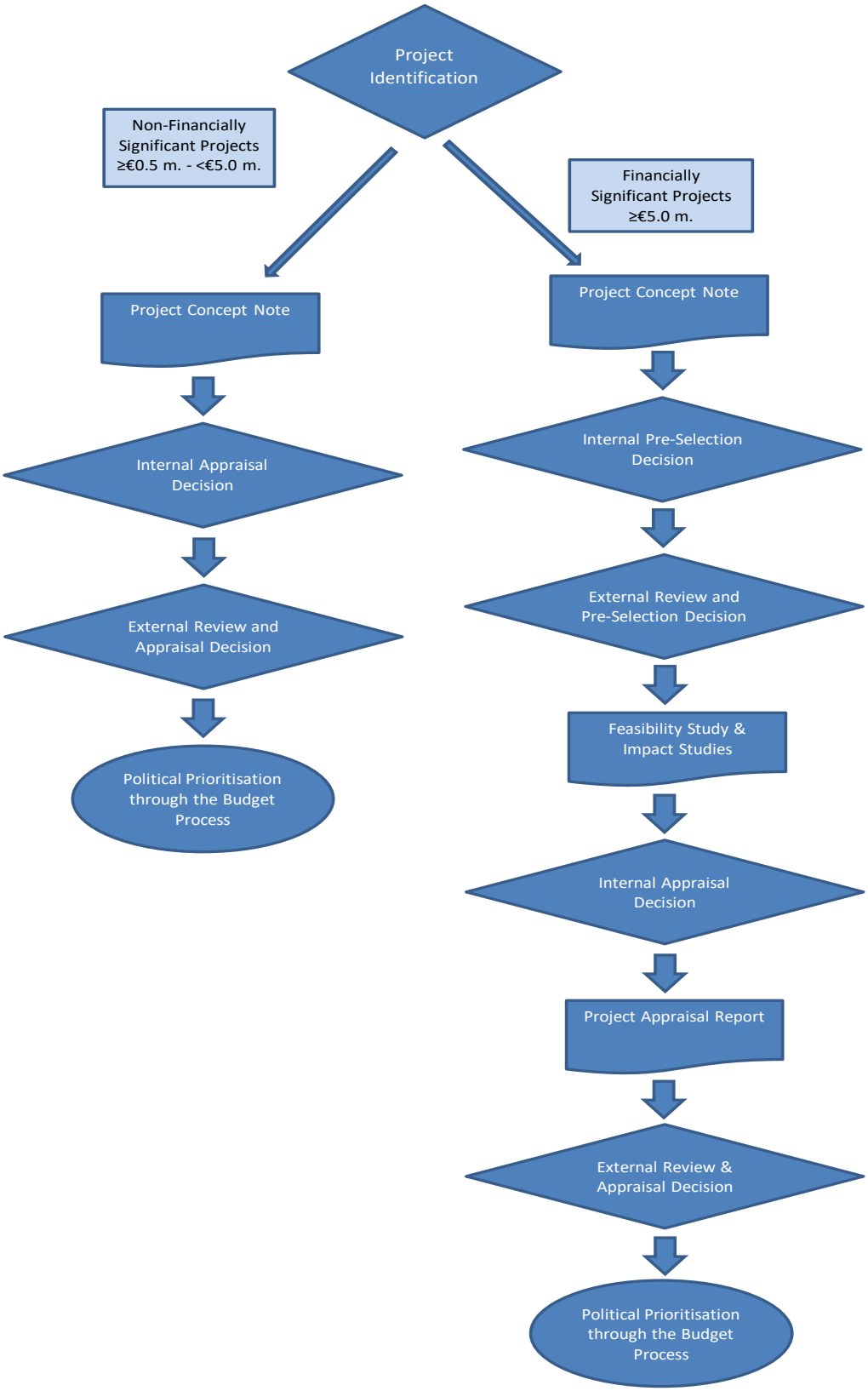
If the answer to all the screening questions is in the affirmative, then the potential PPP project may proceed to the value for money assessment set out in Part IV of the Manual.

3.4 Project Appraisal for Non-Financially Significant Projects

As indicated in the PIM Guidelines, non-financially significant projects are not required to follow the same appraisal methodology as financially significant projects. These projects must, however, still be assessed and receive a positive appraisal decision in order to be considered for budget funding and subsequent implementation. A simplified approach to project appraisal is therefore applied for non-financially significant projects. Figure 3 illustrates the main differences in analytical requirements and decision-making compared to financially significant projects. Essentially, appraisal of non-financially significant projects involves a single-stage decision-making process based on the preparation of a Project Concept Note, with an external review by the DG EPCD and Budget Directorate to validate project relevance, viability and affordability. Small projects, with capital costs of less than euro 0.5 million, as a rule, will be excluded from this process. However, the Minister of Finance reserves the right to request the application of the simplified approach for any project with a total capital cost below 0.5 million if considered necessary.

As the basis for making an appraisal decision, a Project Concept Note (PCN) should be prepared for non-financially significant projects, following the methodology set out in Part II above. As for financially significant projects, a range of alternatives should be considered and narrowed down to the preferred project, which will then be subject to further design studies and more detailed costing. The preferred project may not be the reference project as initially conceived if analytical work carried out for the PCN reveals that an another alternative is more promising. Economic Entities should therefore remain flexible during the preparation of the PCN and be prepared to make adjustments to the initial proposal as necessary. The effort expended in generating alternatives may, however, be reduced compared to financially significant projects where it will generally be acceptable to compare the proposed project to the do nothing alternative, unless there are some obvious alternative ways of addressing the problem. Similarly, the analytical effort expended on completing the PCN should also be proportional to the scale of the proposed investment, although an estimate of the project's capital costs will always be expected.

Figure 3: Differences in Approach to Appraisal of Financially Significant and Non-Financially Significant Projects



In examining alternatives and deciding which one to take forward, Economic Entities should apply the following criteria using information assembled for the main part of the PCN.

- Viability Criteria
    1. Meeting needs: Extent to which each alternative represents a comprehensive response to the identified needs.
    2. Economic viability: Extent to which each alternative optimises benefits and delivers a return on the required spending – investment and life-cycle costs – from the perspective of the operating entity and society as a whole.
    3. Reliable implementation arrangements: Extent to which each alternative is commensurate with the capabilities of the implementing organisation.
    4. Managing risks: Extent to which any significant risks associated with each alternative can be mitigated and/or managed.
- Sustainability Criteria
    5. Operational sustainability: Extent to which each alternative is commensurate with the capabilities of the operating entity.
    6. Long-run budgetary impact: Extent to which future operations and maintenance expenditures are in line with realistic budgetary expectations or finances of the operating entity.
    7. Environmental and social sustainability: Extent to which any significantly negative environmental and social impacts can be mitigated and/or managed.

If a project has diverse benefits it may be useful to employ a multi-criteria scoring and weighting approach to comparing alternatives and reaching a judgement on economic viability (criterion 2 above). Step 9 of project appraisal for financially significant projects gives guidance on how to employ such an approach. The project that emerges as the preferred alternative should be subjected to the same quality checks as those required for financially significant projects at pre-selection, as set out in Table 1 in Part II above. The same as for pre-selection of financially significant projects, a positive opinion is required for each criterion to arrive at a positive appraisal decision.

As with financially significant projects, the PCN for non-financially significant projects concludes with a discussion of the approach to further studies; however, in this case further studies will be concerned with the more detailed design work and assessment of technical feasibility required before project implementation can commence (rather than further analytical work). There may also be statutory requirements for impact studies that should be identified.

The in-depth design work following appraisal will also include calculation of more reliable capital cost estimates. Economic Entities should therefore review a positive project appraisal decision in the light of these more accurate cost estimates to ensure that decision remains valid. Any anomalies should be reported to the DG EPCD.

The template for the PCN for non-financially significant projects is included as Annex 7 to the Manual and is in three parts:

A. Basic information and analysis;
B. Qualitative comparison of project alternatives; and
C. Quality assessment of preferred alternative.

Part IV: Methodology for PPP Value for Money Assessment

1. Overview of PPP Value for Money Assessment

Potential PPP projects for which answers to the screening questions at Step 9A (see Part III, Section 3.4 of the Manual) are in the affirmative will be subject to a PPP value for money assessment, as described below.PPP value for money assessment is the assessment of whether a PPP procurement modality will bring added value in terms of a decrease in costs or in terms of an increase in quality in a manner that justifies the increased costs entailed, including but not limited to higher financing costs. PPP value for money assessment is conducted after the Project Appraisal stage and is reviewed again during detailed project preparation immediately prior to implementation, based on the final project technical design and the proposed contract design. The methodology for conducting the value of money assessment includes a combination of qualitative review and quantitative analysis. Quantitative assessment includes the analysis of costs, including risks, identified in the financial analysis conducted in Step 8 of Project Appraisal. Qualitative review includes the assessment of drivers and screening questions assessed during Project Appraisal, on the basis of deeper and more accurate analyses. Based on the PPP value for money assessment, DG EPCD will evaluate the PPP procurement option, or request additional information.

The value for money assessment includes the following steps:

a. Assessment of Costs, Revenues, and Risks for PPPs

i) Assessment of costs and revenues

ii) Assessment of risks

b. Qualitative review:

i) Review of possible drivers assessed during Project Appraisal based on additional information assessed in steps 4 – 8

ii) Review of screening questions assessed during Project Appraisal based on additional information assessed in steps from 4 - 8

c. Decision on the Value for Money proposition (Project Selection stage)

2. Steps in the Value for Money Assessment

The steps in the Value for Money assessment involve the following:

a. Identifying the Costs, Revenues and Risks of the Project under PPP

At this stage, before the structuring of a PPP contract (including detailed risk allocation and a credible mechanism of incentives), a decision on the PPP value for money proposition will be based on qualitative indicators as well as the quantitative information available.[123] The information provided in the Project Appraisal stage can be used to create a Public Sector Comparator (PSC) robust enough for informing the qualitative assessment. The aim of the PSC is not to make a direct comparison to a PPP model, but instead to provide an understanding of the absolute and relative sizes of the main cost and revenue items, thus allowing for a proper understanding of the risks and possible drivers of economy and efficiency and to providing a basis for reviewing the Screening Questions. The PPP value for money assessment should start with a review of the costs and revenues expected from the project as

[123] The quantitative methodology for the assessment of Value for Money in PPP procurement, originally developed in the United Kingdom, was withdrawn in 2012, having been replaced by a qualitative assessment.

identified in the financial analysis of the operating entity (Step 8 of Project Appraisal). It should identify project costs and revenues that may arise from the project being implemented by a special purpose vehicle[124] (such as taxes, or insurance obtained from the market instead of government self-insurance by pooling risks). These costs and revenues may be different from those encountered when the project is implemented by a public entity under the usual arrangements. The risks identified in Step 7 (Analyze Risks and Plan for their Management) of the Project Appraisal stage should be then be analyzed according to the methodology outlined below in order to identify value added by the PPP.

a.i.* Assessment *of Costs and Revenues

The costs and revenues of the project should be obtained from the financial analysis of the operating entity conducted as a part of Step 8 in the Project Appraisal. The PSC is based on the costs and revenues of the project if implemented under traditional public procurement with no private financing, including all the costs and revenues identified above. The PSC outlined here is a calculation of the costs and revenues that will be used for comparison with a future bid by a private investor;[125] at this stage, it is not intended to be used as a tool for establishing the value for money of PPP procurement over traditional procurement—the quantitative information available at this stage is not enough for that purpose. Following best global practices, the PSC will be recorded at Selection stage, as a reference and basis for project structuring during the Procurement stage. Project figures presented by economic entities are supposed to present a reasonable expectation of the costs and revenues of the project, and deserve formal recording at Selection stage, in order to be compared later, during Procurement stage, with the improved PSC that will then be computed. Any deviation of the values of that improved PSC from the Selection stage PSC should then be demonstrated on the basis of additional quality brought by the PPP modality, or of risk factors not considered at Selection stage.

Costs that should be factored in include additional tax requirements (that may not affect a government entity), insurance costs (that may not affect a government entity if operating under self-insurance by pooling the risks of different projects and having them guaranteed by government), and depreciation of assets (if accounting rules for depreciation in a specific public sector are different from the private sector rules). Costs incurred are project specific and should be identified by the Economic Entity. Any losses in revenues due to the ineligibility to receive government subsidies should be also factored in (a project company delivering public services may not have access to the full range of subsidies and transfers available to government entities).

a.ii. Assessment of Risks

Risk assessment is a critical step in the PPP Value for Money assessment as it presents the rationale for the contractual risk allocation which shapes behavioral incentives. Risks for public sector implementation of a project have been identified and assessed in Step 7 of project appraisal. PPP procurement changes the risk profile of the project by virtue of PPP contracts being integrated long-term contracts. Integration of the design, construction and operation of projects into one contract forces a single entity to assume risks from all phases.

[124] The creation of a Special Purpose/Project Vehicle (SPV) is a key feature of most PPPs. The SPV is a legal entity that undertakes a project. All contractual agreements between the various parties are negotiated between themselves and the SPV. SPVs are also a preferred mode of PPP project implementation in limited or non-recourse situations, where the lenders rely on the project's cash flow and security over its assets as the only means to repay debts. (EN ESCAP).

[125] At the procurement stage, the PSC is the baseline for comparison to assess the value for money of a private proposal, taking into account quality differences.

The main objective of the risk assessment is that the contractual risk allocation is robust. A non-robust risk allocation may result in risk being transferred back to the public sector by the private partner during the life of the project. A second objective should be the identification of the main fiscal risks and political risks for government. In case quantification of fiscal and political risks is not possible, a qualitative assessment of these risk should be undertaken. The PPP value for money assessment should review the benefits of the PPP using the identified qualitative and/or quantitative risks.

Risk allocation. In order to create incentives for good project performance, project risks should be contractually allocated to one or the other party in the contract. The basic principle for risk allocation states that each risk should be allocated to the party best able to manage it. For example, the risks linked to design, construction and maintenance of the project assets are typically allocated to the private partner. Whenever the available information does not allow for a decision based on that principle, a decomposition of the relevant risk into more specific risks may be required. For example, a change-in-the-law risk may result in unanticipated costs for the private entity, and will require clear distinction between risk sub-classes. In some cases (such as additional safety measures for road users), the risk of an increase in cost may be allocated to the public sector. In other cases, such as the risk of foreseeable changes to the law, may be allocated to the private partner. Risk allocation should carefully consider the ability of each party to manage each risk including the ability to face its financial consequences. In cases where parties may not be able to manage a risk, parties may choose to jointly face a risk in exceptional circumstances (forcing the parties to negotiate a solution in case the risk occurs). For general risks that typically affect each and every project (such as force majeure, material adverse government action, and change in law), standard risk allocation should be applied, following international best practices already identified by the G20[126]. More attention is required for risks related to specific types of projects, such as roads, ports, hospitals. In such cases, options that create incentives for proper management of the project and result in efficiency savings should be considered. Efficiency savings that compensate for the higher cost of private finance (relative to public finance) and still bring value to government and society should be prioritized when designing incentive arrangements[127].

Allocation of core risks. Risks associated with designing, building, financing, operating (or at least maintaining) a capital investment should be allocated to the PPP operator. Since the PPP operator will operate the project for a long period (typically thirty years or more, depending on project characteristics), and its ability to recover its investment costs depends on the performance of project, the private operator typically faces risks over the entire project cycle. These include design risks, construction risks, financing risks, and operating risks. The proper definition of minimum project requirements, performance criteria and reference levels (in terms of efficiency, fairness, and verifiable measurability), will allow for those risks to be credibly allocated to the private PPP operator at this stage. At this stage, the definition of risks is not required to be complete, but sectoral experts should have confirmed the possibility of adequately defining those requirements, criteria, and levels.

[126] For recommendations on the allocation of general risks, see *World Bank Group Report on Recommended PPP Contractual Provisions, 2015 Edition*, standard provisions endorsed by the G20 Infrastructure and Investment Working Group, available at http://ppp.worldbank.org/public-private-partnership/library/wbg-report-recommended-ppp-contractual-provisions

[127] The preparation of the tenders by the transaction advisor will provide additional data and information to assess the risk allocation quantitatively. The risk-allocation exercise carried on after the Project Appraisal stage does not aim at optimizing risk allocation or structuring the PPP which is carried out in the Project Implementation stage.

Demand risk. Another key risk that should be assessed is the demand risk for the PPP operator or the Government. Demand risk is the risk that the demand for the service will not be enough to generate sufficient revenue to cover the cost of the project and remunerate the PPP operator. Some contracts allocate the responsibility for collecting tolls or other kinds of user fees to the PPP operator. In these cases, user fees may either be collected on behalf of government, or be considered as revenues for the PPP operator. In the first case, the Government faces the demand risk, which is then not a risk to be assigned to the PPP operator who will be remunerated by the Government as per the contract, and not according to how demand evolves. In the latter case, the PPP operator will face demand risk in the form of potential revenue shortfalls. In some cases where services are provided to users by the PPP operator but are paid for by a public entity, demand risk can be created for the PPP operator. An example of this situation is when a National Health Service pays for clinical services for patients in a PPP operated hospital. In this case, the demand risk (coming from uncertainty regarding future healthcare needs, and from financial constraints) should be included in the assessment of risk for the PPP operator.

Risk assessment should be conducted for various possible risk allocation scenarios presented by Economic Entities in order to identify (and when possible quantify) the potential efficiency savings generated by PPP contractual arrangements[128]. Risk allocation, between public and private partners in a PPP, is central to the efficiency of a PPP contract.

Depending on the type of project, the risk review may follow a specific risk classification already designed for a particular type of projects, a life-cycle classification of risk, or a thematic classification of risk. Risk classifications should help identify all relevant risks in a project, and should be sufficiently comprehensive so as to accommodate the range of risks that may be considered for a particular project. Any specific risks that do not fit in the classification should still be considered as "other" risks. One possible classification of risks is to follow the implementation cycle:

- Design risks
- Construction risks
- Financing risks
- Operational risks (including demand/volume risk)
- Risks that affect all phases of the project (e.g. force majeure, change in law, and material adverse government action).

Risks may alternatively be classified according to the sources of risk:

- Financial risks (including financing, exchange rate, inflation, etc.)
- Engineering risks
- Environmental risks
- Demand or volume-of-service risks
- Other market risks
- Legal risks

[128] The optimal risk allocation scenario will be defined during the project implementation stage when more information is available. Optimal structuring of a PPP project requires the contribution of PPP transaction advisers who should be hired after project selection.

- Political risks (including force majeure and material adverse government action)
- Force majeure risks

Due the specificity of each sector, Economic Entities will present their own risk classification for projects in their sectors. The risk allocation review should guarantee that all relevant risk categories are included in the classification, and should identify the various possible allocations of project risks, in order to highlight (and when possible quantify) the potential efficiency savings generated by PPP contractual arrangements. These benefits could apply to the project as a whole, or to a part of the project where multiple components are involved (such as projects that combine generation & transmission; bulk supply & pipe delivery; building & equipment/fittings & service delivery).

Table 16 illustrates examples of specific risks that, depending on the type of project, may be presented by the economic entities.

Table 16: Risks and their Allocation between Parties

	General risk allocation	Specific risk allocation
Design and construction risks	A PPP contract necessarily allocates design and construction risks to the private partner	Land acquisition (risk may be allocated to one or the other party, or both) Relocation of people and activities (risk may be allocated to one or the other party, or both) Geological risk (depending on legal framework and practices, risk may be allocated to one or the other party) Archeological findings (risk is usually allocated to the public authorities) Environmental issues (risks related to issues already identified are typically allocated to the private partner) Hardship clauses may be considered (unexpected circumstances under which performance becomes more onerous without being impossible)
Financing risks	A PPP contract necessarily allocates the financing risk to the private partner	Public finance (market conditions may require a public entity to provide some financial support to the project) Private finance (in stressed financial markets, government may accept that the private partner uses shorter-term finance, facing refinancing risks)
Maintenance risks	A PPP contract necessarily allocates the maintenance risk to the private partner	Performance should be clearly defined through a set of performance indicators and associated performance goals Hardship clauses may be considered (unexpected circumstances under which performance becomes more onerous without being impossible)

Operational risks	A PPP contract may include in its scope the operation of the capital investment; it may allocate demand risk to the private partner, or not	Performance should be clearly defined through a set of performance indicators (and their goals) expanded to encompass operations Demand risk (may be allocated to the private partner, or to the public partner)
Force majeure	A Force Majeure Event is beyond the control of the parties and should not be allocated to a single party; occurrence generally allows the private partner relief from its obligations under the PPP contract, to the extent that such relief is directly caused by the Force Majeure event	Circumstances that are beyond the control of the parties; that were not foreseeable or, if foreseeable, could not have been prevented or avoided or overcome by the affected party having taken all reasonable precautions and due care (including appropriate insurance); which directly causes the affected party to be unable to comply with all or a material part of its obligations under the PPP contract; and which are not the direct result of a breach by the affected party of its obligations under the PPP contract. Examples are plague, epidemic and natural disasters, fire, explosion, chemical contamination, war and armed conflict, radioactive contamination and ionizing radiation
Change in law	The private partner is compensated in the event of a discriminatory or specific change in law	Discriminatory changes in law (a change in law applying to the PPP project, and not to other projects, or to the private partner, and not to other PPP operators) or specific changes in law (a change in law specifically impacting projects of the type of the PPP project) should be allocated to the contracting authority
Material adverse government actions	The private partner is excused from the performance of its obligations under the PPP contract to the extent that it is prevented, hindered or delayed in the performance of such obligations by reason of the Material Adverse Government Action and is entitled to compensation	Defined as any act or omission by the contracting authority or any relevant public authority, which renders the private partner unable to comply with all or a material part of its obligations under the PPP contract and/or has a material adverse effect on the costs or revenues arising from such performance

The proposed risks allocation should be assessed in order to verify that, after considering the allocation of specific risk items, there is significant transference of responsibility of project management to the private partner, in order to provide incentives for contractual performance—

particular relevance should be given to the effective transfer of design, construction, maintenance and financing risks to the private partner.

An example of a possible synthetic table of risk allocation, for a specific toll road, identifying all major risks, is provided in Table 17.

Table 17: Example of Risk Allocation Table for a Specific Toll Road Project

Risk	Private partner	Public partner
Design and construction	X	
Traffic	X	
Toll levels		X
Land acquisition		X
Environmental licenses		X
Taxes	X	
Exchange rate	X	
Financing	X	
Force majeure (insurable)	X	
Force majeure (non-insurable)		X

If Economic Entities present quantitative risk assessments, they should also present the methodologies that were used for their production, and the assumptions used. Where a quantitative assessment of the risk allocation is not presented by the Economic Entities, due to limited information at this stage, weight should be given to the qualitative assessment of possible drivers of PPP, and associated benefits.

b. Qualitative Review

The risk assessment in Step (a) "Identifying the costs, revenues and risks of the project under PPP" may change the perception of costs and benefits associated with projects. Possible Drivers and Screening Questions should be re-assessed at this stage based on the information generated during the cost, revenue, and risk assessment. Quantified information on project costs and revenues, and the analysis of project risks and its allocation under a PPP, should now confirm or refute some of the prior qualitative assumptions made during Appraisal stage on Possible Drivers and Screening Questions.

b.i. Review of Possible Drivers

The drivers considered during the Project Appraisal stage, described in Paragraph 4 of Part III, should be reviewed in the light of the information obtained during the previous steps of the Value for Money assessment. As in the previous stage, a project should be considered for PPP procurement only if based around one or more reasonable drivers.

b.ii. Review of Screening Questions

The screening questions considered during the Project Appraisal stage, (see Section 3.4 of Part III), should be reviewed in the light of the information obtained during the previous steps of the Value for Money assessment. As in the previous stage, a project should be considered for PPP procurement only if the answer to all the Screening Questions is in the affirmative.

c. Decision on the Value for Money Proposition

A project should be accepted as a potential PPP only if a clear value-for-money rationale has been identified and deemed feasible based on the Possible Drivers and Screening Questions. The

identification of possible drivers and the answers to the screening questions should be fully consistent with the costs, revenues, and risks identified. Where a clear rationale has not been identified, the additional complexity, transaction costs, and financing costs of a PPP are unlikely to be warranted. The procurement of a project under a PPP contract is considered feasible if relevant drivers are identified, and if all screening questions receive a "yes". Projects that were flagged as potential PPPs by Economic Entities, which did not pass the Possible Driver test and meet all the Screening Questions will not be approved as potential PPPs. In this case, the DG EPCD should produce a statement explaining why PPP cannot be considered as a preferred option.

For instance, the identification of a significantly better ability of the private sector to manage a complex project, bringing efficiency savings, coupled with affirmative answers to all Screening Questions, should conduce to the approval of the project as a potential PPP. Conversely, a negative answer to any one of the Screening Questions in Table 15, should conduce to the project not being accepted as a potential PPP.

Annexes

Annex 1: Template for Project Concept Note for Financially Significant Projects (≥ €5m.)

Information Requirement	Response	Source of Evidence/Additional Comments
Administrative Information		
1. Project name		
2. Economic Entity submitting the project		
3. Senior official responsible for the project within Economic Entity		
4. Subordinated entity responsible for project and its implementation (if different from the Economic Entity)		
5. Responsible official in subordinated entity (if applicable)		
Project Rationale and Assessment of Need		
Intervention Logic		
6. Describe the specific problem that the project is intended to address and its severity.Where possible quantify the problem.		
7. Explain how the project will alleviate this problem. Where relevant give the standards that should be met.		
8. List the alternative ways of addressing the problem which have been considered, including any policy measures not involving capital expenditure (including the do nothing or do minimum option).		
Needs Assessment		
9. Identify the specific target group intended to benefit from the project.		
10. Indicate approximately how many end-users there will be for the services provided by the project. Specify the unit of measurement of users (e.g., individuals, households, businesses).		
11. Provide a preliminary estimate of the physical demand for the services provided by the project on completion and a rough estimate of		

Information Requirement	Response	Source of Evidence/Additional Comments
how fast this demand expected to grow. Specify the unit(s) of measurement of demand (e.g., cubic metres of water per day, vehicles per day, clients per day, etc.).		
12. Specify the approximate physical capacity of the proposed facilities, indicating the unit(s) of measurement e.g., cubic metres of water per day, vehicles per day, clients per day, square metres of useable space, etc.). (physical capacity should be expressed in the same unit of measurement as physical demand is expressed in question 11)		
Project Scope		
13. Describe the project and its components and explain how these represent a comprehensive solution. Wherever relevant mention the physical characteristics of the project, the location and size of the project, the type of the establishment, the current use of land, the type and altitude of the area where the project will be executed, the dimensions and capacity of the project and report the presence of any Natura 2000 areas and special interest areas.		
Strategic Case		
14. Indicate how the project will contribute to the achievement of the Government's strategic goals and to the achievement of the goals and objectives of the Economic Entity. Provide any program documents supporting the selection of specific project priorities.		
Preliminary Economic Case and Analysis of Alternatives		
Project Implementation Costs		
15. Provide an estimate of the cost of further preparatory studies required for project appraisal, i.e., surveys, preliminary design, feasibility study, environmental and social impact studies, etc.		

<table>
<tr><th>Information Requirement</th><th>Response</th><th>Source of Evidence/Additional Comments</th></tr>
<tr><td>16. Provide an indicative estimate of the total estimated capital cost of the project and relevant alternatives, including technical variants, in current prices. Capital costs to include all implementation costs, up to project completion, required to deliver anticipated benefits to end-users. If possible, include the cost of any environmental mitigation measures that are planned.
Extend table as necessary for alternatives. For the completion of this table, where alternative project options involve capital expenditure please use the excel sheet provided in Annex 3 and submit it to DG EPCD.
The excel sheet should be provided for each alternatives.
For alternative project options that do not involve capital expenditure fill in column “Basis for Estimations” in this table. For these project options report unit costs or any supporting documents for the estimation of cost.
Provide the unit cost of a similar completed project.</td><td colspan="2"><table><tr><td></td><td>Total</td><td>Basis for estimations[129]</td></tr><tr><td>Reference project</td><td></td><td></td></tr><tr><td>Alternative 1</td><td></td><td></td></tr><tr><td>Alternative 2</td><td></td><td></td></tr><tr><td>Alternative 3</td><td></td><td></td></tr><tr><td>Etc.</td><td></td><td></td></tr></table>Project Unit cost:

Unit Cost of a similar completed project:</td></tr>
<tr><td colspan="3">Project Benefits</td></tr>
<tr><td>17. Identify the main benefits to the users of the assets that will be created by the project.</td><td></td><td></td></tr>
<tr><td>18. Identify any significant externalities, i.e., benefits or costs to non-users.</td><td></td><td></td></tr>
<tr><td>19. Explain any significant differences in benefits between project alternatives.</td><td></td><td></td></tr>
<tr><td>20. Identify the main benefits and costs that it is considered feasible to value, including intangible benefits and both positive and</td><td></td><td></td></tr>
</table>

[129] Should be completed only for alternative project options that do not involve capital expenditure.

Information Requirement	Response	Source of Evidence/Additional Comments
negative externalities. Identify the important positive and negative project impacts that it will be difficult to value.		
Economic Viability		
21. Provide an estimate of the approximate capital cost per user or capital cost per unit of demand for the final service. (both if possible)		
22. Indicate how these costs compare with the costs of project alternatives and with other similar, recently completed projects.(capital cost per user or capital cost per unit of demand)		
23. Explain why the project is expected to represent a worthwhile use of public resources compared to alternatives (including doing nothing), given the available information on potential costs and benefits, and identify promising alternatives This section should be a summary of the analysis undertaken in the PCN so far. A statement verifying that: the project addresses a clearly identified need, is in line with Government policy and the Ministry's priorities, will deliver significant benefits to citizens that are greater than those of alternative project options and the capital cost looks reasonable compared to other similar projects		
24. Describe the most important risks and assumptions that could potentially affect the economic viability of the project if they did/did not occur. Identify any obvious mitigation measures that it would be sensible to consider during planning.		
Affordability Show the projected budgetary impact of the project both during the period of preparation, design, implementation and the period of its operation. Extend or contract the tabular format as necessary to capture the full construction period and two years post-construction. Approximate estimates only are expected, based on best available		

Information Requirement	Response	Source of Evidence/Additional Comments

information. For the completion of this table please use the excel sheet in Annex 3 and submit it to BD MoF.

25.

[1] Budget Expenditure Savings: Report any savings that might incur from the implementation of the project e.g. saving rents from the construction of a new building or saving maintenance/fixing expenditure of an old costly equipment as a result of the purchase of new equipment.

[2] Budget Provision: Report the budget amount that is required to implement the project. In some cases budget expenditure is allocated in more than one Ministry/Department e.g. expropriations, in these cases the entire amount must be included, including expropriations, with a footnote explanation on the cost of expropriations.

	Year 1	Year 2	Year 3	Year 4+	Completion year +1	Completion year + 2	Outer year (average)
	Construction period				Operation period		
Feasibility Study							
TORs and Designs							
Purchase of Land							
Capital outlays							
Recurrent outlays (O & M)							
Total Project Cost							
Budget Expenditure Savings [1] Head --							
Budget Provision [2] Head --							
Revenues							

26. If matching funding from local government or self-financing public agencies is expected to be required, provide some evidence that adequate budgetary provision can and will be made.		
Implementation		
Procurement		
27. Identify any specific issues that will need to be considered when deciding the approach to procurement.		
28. Set out any characteristics of the project that could favour PPP as a procurement option.*		

Implementation Arrangements and Potential Constraints		
29. Summarise the proposed arrangements for overseeing and/or managing project implementation.		
30. Provide outline evidence that the organisation responsible for overseeing and/or managing implementation has adequate capabilities for implementing a project of the proposed scale and nature, or indicate what additional measures might be required to make this the case.		
31. Identify any potentially critical constraints that may need to be overcome, e.g., environmental restrictions or land acquisition, or additional measures, including legislative changes, that may need to be put in place before the project can be successfully implemented.		
Sustainability Issues		
32. Specify the organisation which will own and operate the asset created by the project.		
33. Provide outline evidence that the organisation responsibility for operating and maintaining the capital asset once completed will have adequate technical, managerial and financial capacity to do so. If this is not the case, specify what measures will be necessary to create the necessary capabilities.		
34. Explain how operating, maintenance and depreciation expenses are expected to be covered once the project is completed, indicating whether user charges have to be implemented or raised.		
35. Briefly describe any potentially significant environmental impacts that may need further investigation and suggest possible mitigation measures, where likely to be necessary.		
36. Briefly describe any potentially significant social impacts that may need further investigation, particularly those relating to the allocation of costs and benefits between the various project		

stakeholders, and suggest possible mitigation measures, where likely to be necessary.		
Approach to Further Studies and Consultations		
37. Explain which project alternatives will be taken forward to project appraisal and which will be dropped as a result of the pre-selection analysis, including economic viability and affordability.		
38. List the further studies which will be required before an appraisal decision can be taken. If a pre-feasibility study# is expected to be required to narrow down the short-list of projection for appraisal, explain why.		
39. Identify any specific issues that will have to be given special attention as part of further studies, including findings from ex post evaluation of similar projects.		
40. Confirm whether or not a social impact assessment will be required and, if it is, specify the main areas of focus.		
41. Identify whether there is a legal requirement for an environmental impact assessment or/and an adequate evaluation to be performed.. Information to be provided: -parcel (s) size -planning zone of the parcel(s) -proximity of nearest activities -proximity with Natura 2000 area(s) -brief description of project including the major technical aspects (technology) to be used -significant negative environmental impacts -significant positive environmental impacts -main environmental aspects to be considered: land use (change) biodiversity (flora and fauna) soil air (ambient air, point-source) water (underground, inland, coastal) minerals		

waste production noise climate change (mitigation / adaptation) social aspects (social acceptance or not)		
42. Describe any formal or informal consultations that will be required before an appraisal decision can be taken.		

*The choice of procurement method - traditional capital investment procurement or public-private-partnership (PPP) - will be made at a later stage, after appraisal and on the basis of a value for money analysis as explained in Part IV of the Manual. At Pre-Selection Stage, the intention is only to flag up projects with characteristics that might make them suitable for PPP and no decision is implied.

#A pre-feasibility study is not a requirement, but may be useful to decision-makers for particularly large or complex projects.

Annex 2: Sector Specific Guidance on Identifying and Valuing Project Benefits and Costs

A. Concise Guidance by Sector

Roads

Financial Analysis		Economic Analysis		Typical Approach
Financial Inflows	Financial Outflows	Benefits	Costs	
Tolls on suitable roads (not currently relevant in Azerbaijan) Transit charges (international traffic)	Investment costs Land acquisition Design and supervision Construction of road pavement and drainage Bridges and tunnels Operating costs Routine maintenance - cleaning drains, controlling vegetation, patching potholes and sealing cracks Periodic maintenance, including periodic resurfacing at planned intervals Technical & administrative personnel	Savings in vehicle operating costs for existing and new road users - diverted and generated traffic - and for non-users on other roads benefiting from congestion relief. Estimating vehicle operating costs from scratch is not straightforward and models based on international experience are available. Savings in time for existing and new road users - diverted and generated traffic - and for non-users on other roads benefiting from congestion relief. Requires estimates of the value of person time - working and non-working – and freight time. Person time values can be based on average wage costs. Freight time values are derived from the cost to businesses of working capital. Estimating time savings in a congested urban environment is complex as account needs to be taken of wider network effects. Traffic models are available to assist, but these are data and skill intensive and their use is best reserved for projects of national significance. Reductions in the cost of accidents. Accident costs include damage to vehicles, medical costs and costs related to loss of life and	Negative environmental externalities: Air pollution Increased noise and vibration Visual impact on landscape Pollution of water courses from run-off Damage to heritage sites Social dislocation from resettlement and community severance Projects that generate additional traffic may increase overall CO_2 emissions with negative impacts globally on climate change.	Financial analysis has limited meaning in the context of roads, except for proposals to establish toll operations. Socio-economic cost benefit analysis is usually performed for major road projects. Models are available to assist in undertaking the analysis, HDM-4 for example. Even where land is already owned by the public sector it needs to be valued at its opportunity cost – value in next best alternative use – in economic analysis. Some economic and social costs and benefits are less easy to quantify in monetary terms. Multi-criteria analysis can be used to take account of these factors in decision-making. Alternatively an appraisal balance sheet can be used to bring together in one place all the dimensions to be taken into account in reaching a decision on the feasibility of a project. Some countries have estimated the social cost per tonne of different pollutants, notably CO_2. International

		injury. The latter can be estimated by the losses to national output/income. Many countries also include monetary values for grief and suffering derived from in-depth research studies. Savings in road maintenance costs. Wider economic and social benefits: Improved access to social services and markets Better economic integration of peripheral localities and regions Environmental benefits from fuel savings due to congestion relief (but may be eroded by generated traffic).		values could be used to estimate the cost of these global externalities (and the benefits of projects that save on fossil fuel use). However, the estimates vary greatly between countries depending on the methodological approach. An alternative is just to give a quantitative assessment of the forecast volumes of pollutants and take this into account in the feasibility decision.

Solid Waste Management

Financial Analysis		Economic Analysis		Typical Approach
Financial Inflows	Financial Outflows	Benefits	Costs	
Revenues for collection & treatment paid by private and public users. Sales of products recovered from recycling. Sales of energy produced from incineration or landfill (heat & power).	Investment costs Land acquisition Building Equipment Replacement costs Operating costs Energy Materials Services Technical & administrative personnel costs Maintenance costs	Health improvements from removal of waste. These can be valued in terms of reductions in medical costs and lower income losses from absences from work. Enhanced urban environment. Forecast changes in land values can serve as a proxy measure of improvements in urban amenity. Energy recovery and savings in use of environmentally damaging energy sources.	Negative environmental externalities in the locality of the treatment or disposal facility: Damage to health due to air, water or soil pollution Water and soil contamination Negative impacts on landscape Additional traffic	Financial analysis of the project from the perspective of the operating entity. Estimation of cost recovery tariffs and verification against results of surveys of households' willingness and ability to pay. Socio-economic cost benefit analysis is usually reserved for major projects, otherwise cost-effectiveness analysis performed. External economic costs in the locality are difficult to value and are often captured by the costs of reasonable mitigation measures. Another approach is to capture them by estimating the decline in property or land prices in the vicinity of the treatment and disposal facility. Multi-criteria analysis can be used to assess the negative impacts of different alternatives and decide on the optimum solution

Water Supply and Wastewater Treatment

Financial Analysis		Economic Analysis		Typical Approach
Financial Inflows	Financial Outflows	Benefits	Costs	
Revenues from tariffs or fees charged to households, businesses and the public sector for water, sewerage and wastewater treatment services. Possible proceeds from the sale of water in the case of re-use, for example, treated household wastewater for agricultural uses. Revenues from any additional services offered by the utility company, installation and network connection for example.	Investment costs Land acquisition Works Equipment Start-up costs Operating costs Cost of bulk water Energy Materials Services Technical & administrative personnel costs Maintenance costs	The value of the additional water supplied and/or treated compared to the situation without the project (where there may be considerable suppressed demand if water pressure is low or there are supply interruptions). The economic value of the water will generally be higher than the financial price charged to users, which can be seen as representing the lower bound of benefits. The difference represents consumer surplus in the case of households and producer surplus in the case of enterprises. Consumer surplus can be measured by making estimates of willingness to pay (WTP) for households by reference to the cost of the next best alternative sources being used, for example, water from tankers, bottled drinking water and home purification. In the case of sanitation, use of septic tanks can be more expensive than connection to mains sewers and the difference in costs can be a measure of consumer surplus. The value of time spent fetching water from wells or standpipes is another measure of WTP. Care must be taken not to double count or exaggerate benefits when using consumer surplus measures. Enhanced property values in areas with piped wastewater collection systems can be a proxy measure of benefits. Care must be taken not to double count benefits estimated by other means when using property values as a proxy. For supply of water to industry or agriculture, it is possible to estimate the added value of the additional output that is attributable to	Negative environmental externalities arise from the construction of facilities and from the use of scarce water resources in meeting new demands.	Financial analysis of the project from the perspective of the water services utility company to verify sustainability and the overall impact on the finances of the operating entity. Revenue forecasts need to be based on realistic collection rates. Estimation of tariffs and tariff structure consistent with cost recovery policy – either full cost recovery or only operating and maintenance costs – and social equity considerations. Verification of tariffs against the results of surveys of households' willingness and ability to pay. Ability to pay is important: over-optimistic assessments of potential users' ability to pay pose a frequent risk for the financial sustainability of projects. In particular, new users may not connect to new sewerage systems if tariffs and fees are seen as too high. Cross-subsidisation between richer and poorer households and between less and more costly regions may be necessary. Estimation of any financial subsidies required to achieve sustainable operations, while meeting social policy objectives. Socio-economic cost benefit analysis is usually only carried out for major investments. Analysis of replicated projects using standardised designs can be based on the analysis of prior

		increased water availability. It is, however, not easy to do this and estimates need to be scrutinised carefully for the realism of assumptions. Health benefits may arise from reducing diseases caused by contaminated water supplies, poor sanitation arrangements or discharge of untreated wastewater into water courses. These can be measured in terms of reduced treatment costs plus the lower value of income lost due to days off work. Exploitation of more suitable water resources or leakage reduction programs may preserve water resources for other alternative uses. Treatment of wastewater before discharge into water courses protects or improves water bodies for alternative uses and enhances amenity value. These uses can be identified and valued, although valuation is not necessarily straightforward. Values will tend to be higher where water is scarce.		projects, suitably adjusted for capacity and demand. Cost-effectiveness analysis is used to identify optimum water supply solutions. Multi-criteria analysis can be used to prioritise multiple small schemes within a major programmatic project. Cost-effectiveness analysis can be used to identify suitable standard designs to replicate.

Electric Power (and Other Forms of Energy) - Distribution and Production

Financial Analysis		Economic Analysis		Typical Approach
Financial Inflows	Financial Outflows	Benefits	Costs	
Sale of energy (electricity, gas and heat). State budget subsidies to energy providers for specific purposes Reduced costs for the purchase of bulk energy (projects to develop cheaper sources)	Investment costs Design Works Land Testing of the capital investment Operating costs Goods & services for production Maintenance costs Technical & administrative personnel costs Fuel and electricity	The monetary value of the additional energy supplied compared to the situation without the project (where there may be considerable suppressed demand if there are frequent electricity black-outs or brown-outs). The economic value of the energy will generally be higher than the price charged - this difference represents consumer surplus in the case of households and producer surplus in the case of enterprises. This can be measured by making estimates of willingness to pay (WTP) for households by reference to the cost of the next best alternative sources being used, for example, if households are using generators to meet supply shortages. Similarly, if businesses are using their own generators this cost can be a measure of producer surplus. There needs to be strong evidence of consumers' willingness to pay more. Benefits in terms of reduced use of environmentally damaging energy sources through the use of renewable energy sources or by means of energy saving projects.	Negative environmental externalities in the locality of the generation or distribution facility from construction and operation: Air and noise pollution Negative visual impacts on landscape Additional traffic Wider negative externalities, from increasing energy production using fossil fuels and adding to global CO_2 emissions.	Financial analysis of the project from the perspective of the energy company to verify sustainability and the overall impact on the finances of the operating entity. Revenue forecasts need to be based on realistic collection rates. Estimation of cost recovery tariffs and verification against the results of surveys of households' willingness and ability to pay. Generally, full cost recovery – meaning recovery of capital costs as well as operating and maintenance – will be the aim. Cross-subsidisation between different categories of consumers and/or government subsidies to meet social policy objectives, rural electrification for example, may need to be considered. Socio-economic cost-benefit analysis for major projects, otherwise cost-effectiveness analysis. Cost-effectiveness analysis used to analyse alternative power generation alternatives and optimise technical variants on the basis of minimising discounted total cost (new capital investment plus lifetime system operating costs). Least cost solutions tested using cost-benefit analysis to net benefits – revenue from tariffs used as a proxy for benefits, with consumer surplus added in if evidence points to it being significant. Caution needs to be

				exercised with projects where economic viability is shown to depend largely on consumer surplus estimates, which are generally subject to a wide margin of error. External economic costs in the locality are difficult to value and are often captured by the costs of mitigation measures. Another approach is to capture them by estimating the decline in property or land prices. Some countries have estimated the social cost per tonne of different pollutants, notably CO_2. International values could be used to estimate the cost of these global externalities (and the benefits of projects that save on fossil fuel use). However, the estimates vary greatly between countries depending on the methodological approach. An alternative is just to give a quantitative assessment of the forecast volumes of pollutants and take this into account in the feasibility decision.

Analysis of Capital Investment Projects in Social Sectors

Health and education projects and projects from other social sectors are best assessed in terms of their consistency with an asset development and management plan for the operating institution. This needs to be based on reliable information on asset condition derived from an asset management system. The asset development and management plan needs to be closely linked to a broader strategy for service delivery in the sector, which is framed within realistic resource constraints. Public investments in health and education are usually policy-driven and the aim should be to ensure that capital investment choices meet policy objectives in the most cost-effective way. This requires consideration of alternatives and comparison of the costs per unit of output. Because of the difficulty of placing monetary values on benefits and the high margin of error attaching to any estimates that are made, socio-economic cost-benefit analysis is, in practice, rarely performed.

Education Capital Investment

Financial Analysis		Economic Analysis		Typical Approach
Financial Inflows	Financial Outflows	Benefits	Costs	
Fees – usually not charged for basic education; possibly charged for higher and vocational education Annual subscriptions Revenues from possible paid auxiliary services Transfers to autonomous institutions from the State budget	Investment costs Land acquisition Buildings and fixtures & fittings Recreational facilities Furniture & equipment Operating costs Professional staff – teachers, trainers, lecturers Support staff Materials Utilities Maintenance	Improved employability in more productive jobs and increased life-time earning potential of pupils, students and trainees. There is much quantitative evidence on the personal returns to education in terms of higher incomes which tend to increase with educational level. Many diffuse but important benefits to society from an educated population which are more difficult to measure.	No obvious negative externalities apart from local traffic effects. As evidence, residential property values tend to be higher closer to education establishments.	Financial analysis has limited meaning for educational establishments funded entirely from the State or local budgets. It will be relevant for autonomous public institutions with fee earning capacity, even if benefiting from transfers. In practice, socio-economic cost-benefit analysis is rarely performed for basic education capital investment because of the difficulty of attributing and measuring diffuse benefits. Basic education projects tend to be relatively small and often assembled in broader programmatic projects which should be assessed as a whole. CBA can be performed for major projects in higher education or vocational training where the immediate benefits to individuals in terms of better job prospects and higher incomes are more tangible. WTP may also be used by reference to fees on similar private courses, but careful

				account needs to be taken of quality differences. Even in higher education and vocational training, capital investment alone cannot deliver benefits and it is important to take full account of the associated costs of delivering education services. Most often, cost-effectiveness analysis can be performed to ensure that the most efficient approach to providing education capital investment is being used. It is important that investments are compared on a per pupil/student basis and that the opportunity for more efficient delivery of services through rationalisation of the location of educational establishments is not ignored. Multi-criteria analysis can be used for prioritising smaller projects within wider programmatic projects.

Hospital and Health Capital Investment

Financial Analysis		Economic Analysis		Typical Approach
Financial Inflows	Financial Outflows	Benefits	Costs	
Fees for hospital admission Fees for diagnosis Fees for treatment Additional services, such as single rooms Transfers to autonomous institutions from the State budget	Investment costs Land acquisition Buildings and fixtures & fittings Furniture & equipment Specialised medical equipment Operating costs Professional staff – doctors, nurses, diagnostic specialists Support staff Goods and services for operations Maintenance Medicines	Savings in future health costs from timely and appropriate treatment. Savings in lost output (and income) because of the lower number of working days lost for patients and their families. Reduction in suffering for patients and their families – increased life expectancy and improved quality of life Deaths prevented, which can be valued using the value of a statistical life.	No obvious negative externalities apart from local traffic effects.	Financial analysis has limited meaning for healthcare establishments funded directly from the State or local budgets. It will be relevant for autonomous public institutions with fee earning capacity, even if benefiting from transfers. In practice, socio-economic cost-benefit analysis is rarely performed for health capital investment because of the difficulty of measuring benefits. Primary healthcare projects tend to be relatively small and often assembled in broader programmatic projects which should be assessed as a whole. Even for major healthcare projects socio-economic cost benefit analysis is rarely performed. Benefits arise from specific health interventions and not from capital investment alone. In assessing healthcare capital investment projects it is important to take full account of the associated operating costs of delivering healthcare services and to verify the financial capacity to pay for these. Most often, cost-effectiveness analysis can be performed to ensure that the most efficient approach to providing health capital investment is being used. Healthcare interventions or treatments are often assessed using cost-utility analysis*, which is a form of cost-effectiveness analysis. This compares

				different interventions on the basis of the cost of a quality-adjusted life year (QALY)[#]. However, it has limited relevance for comparing alternatives for investment in healthcare capital investment. Multi-criteria analysis can be used for prioritising smaller projects within wider programmatic projects.

* *Cost-utility analysis (CUA):* a special case of cost-effectiveness analysis often used in the health sector. The purpose of CUA is to estimate the ratio between the cost of a health-related intervention and the benefit produced in terms of the number of years lived in full health by the beneficiaries. Cost is measured in monetary terms. Benefits are expressed so as to allow health states less preferable to full health to be weighted relative to full health. This is usually done in terms of quality-adjusted life years.

Quality-Adjusted Life Year (QALY): a measure of disease burden which includes both the quantity and quality of life lived. Years spent in less than perfect health are given a lower weight than years lived in full health. The QALY is often used in cost-utility analysis to calculate the ratio of the cost to QALYs saved for a particular healthcare intervention.

B. International Guidelines on Project Appraisal for Representative Sectors

Multi-Sector Examples

European Investment Bank: Economic Appraisal of Investment Projects (including water & sanitation, power generation and transmission, ports and energy efficiency)
http://www.eib.org/attachments/thematic/economic_appraisal_of_investment_projects_en.pdf

Asian Development Bank: Cost-Benefit Analysis for Development (including water & sanitation and power generation & transmission)
http://www.adb.org/sites/default/files/institutional-document/33788/files/cost-benefit-analysis-development.pdf

Education

UNESCO: Cost-Benefit Analysis in Educational Planning
http://unesdoc.unesco.org/images/0013/001390/139042e.pdf

Culture

UK: Measuring the Economic Benefits of Arts and Culture
http://www.artscouncil.org.uk/advice-and-guidance/browse-advice-and-guidance/measuring-economic-benefits-arts-culture

Transport: Land Transport

New Zealand Transport Agency: Economic Evaluation Manual
http://www.nzta.govt.nz/resources/economic-evaluation-manual/economic-evaluation-manual/eem/

Transport: Roads

Ireland, National Roads Authority: Project Appraisal Guidelines
http://www.nra.ie/policy-publications/project-appraisal-guideli/

Transport: Airports

USA: FAA Airport Benefit-Cost Analysis Guidance
https://www.faa.gov/regulations_policies/policy_guidance/benefit_cost/media/1999_FAA_Airport_Benefit_Cost_Analysis_Guidance.pdf

Transport: Railways

EIB: Railway Project Appraisal Guidelines
http://www.eib.org/attachments/pj/railpag_en.pdf

Environment
OECD: Handbook for Appraisal of Environmental Projects Financed from Public Funds
http://www.oecd.org/env/outreach/handbookforappraisalofenvironmentalprojectsfinancedfrompublicfunds.htm

Energy: Distribution
European Commission, Joint Research Centre: Guidelines for CBA of Smart Grids and Smart Metering
http://ses.jrc.ec.europa.eu/smart-grid-cost-benefit-analysis

Flood Protection and Coastal Erosion
UK Environment Agency: Appraisal Tools including Flood and Coastal Erosion Risk Management Appraisal Guidance
https://www.gov.uk/flood-and-coastal-defence-appraisal-of-projects

ICT
Australian Government, Information Management Office: ICT Business Case Guide
http://www.finance.gov.au/files/2012/04/ICT_Business_Case_Guide.pdf

Annex 3: Tables for Recording Project Costs and Budgetary Impacts According to Requirements of the Government of Cyprus[130] -Questions 16 and 25 of the Project Concept Note (Q 15 and Q 24 in PCN for non-Financially Significant Projects)

[130] These Tables were developed directly by the Government of Cyprus and included in the Manual at their request.

9. Project Cost

Indicative expected capital expeniture and design expenditure of theproject for a period of up to 30 years in the following tabular form.

Expenditure	Cost Guide	Year 1			Year 2			Year 3			Year 30			TOTAL
		Units	Unit Price	Amount €	Units	Unit Price	Amount €	Units	Unit Price	Amount €	Units	Unit Price	Amount €	Ποσό €
Design Expenditure				**0**			**0**			**0**			**0**	**0**
Preparation of Studies				0			0			0			0	0
Terms of Reference and Designs				0			0			0			0	0
Purchase of Land				**0**			**0**			**0**			**0**	**0**
Rent				**0**			**0**			**0**			**0**	**0**
Capital Expenditures				**0**			**0**			**0**			**0**	**0**
Construction Costs of Buildings and Other Structures				0			0			0			0	0
Buildings				0			0			0			0	0
Roads				0			0			0			0	0
Ports				0			0			0			0	0
Water Supply Projects				0			0			0			0	0
Pipes				0			0			0			0	0
Sport Facilities				0			0			0			0	0
Other (Please specify)				0			0			0			0	0
Machinery and Equipment				0			0			0			0	0
Electronic Equipment				0			0			0			0	0
Computers				0			0			0			0	0
(Servers)				0			0			0			0	0
Software				0			0			0			0	0
Networking				0			0			0			0	0
Maintenance				0			0			0			0	0
Transport Equipment				0			0			0			0	0
Vehicles				0			0			0			0	0
Aircrafts				0			0			0			0	0
Boats				0			0			0			0	0
Motorcycles				0			0			0			0	0
Other (Please specify)				0			0			0			0	0
Other Equipment				0			0			0			0	0
Offices/Desks				0			0			0			0	0
Chairs				0			0			0			0	0
Archive Office Equipment				0			0			0			0	0
Conference Room Furniture				0			0			0			0	0
Other (Please specify)				0			0			0			0	0
Total Expenditure				**0**			**0**			**0**			**0**	0

II. Affordability

Estimated Impact of the project on the budget both during implemetation period and during the period of operation		Year 1			Year 2			Year X			Completion Year +1			Completion Year +2			Average Epxenditure Per Year (for the following years)
Expansion or contraction of the table where appropriate in order to cover the entire construction period of the project and two years following its completion		Περίοδος Κατασκευής									Περίοδος Λειτουργίας						
		Units	Unit Price	Amount €	Units	Unit Price	Amount €	Units	Unit Price	Amount €	Units	Unit Price	Amount €	Units	Unit Price	Amount €	Amount €
	Design Expenditure			**0**			**0**			**0**			**0**			**0**	
	Preparation of Studies			0			0			0			0			0	
	Terms of Reference and Designs			0			0			0			0			0	
	Purchase of Land			**0**			**0**			**0**			**0**			**0**	
	Capital Expenditures			**0**			**0**			**0**			**0**			**0**	
	Construction Costs of Buildings and Other Structures			0			0			0			0			0	
	Buildings			0			0			0			0			0	
	Roads			0			0			0			0			0	
	Ports			0			0			0			0			0	
	Water Supply Projects			0			0			0			0			0	
	Pipes			0			0			0			0			0	
	Sport Facilities			0			0			0			0			0	
	Other (Please specify)			0			0			0			0			0	
	Machinery and Equipment			0			0			0			0			0	
	Electronic Equipment			0			0			0			0			0	
	Computers			0			0			0			0			0	
	(Servers)			0			0			0			0			0	
	Software			0			0			0			0			0	
	Networking			0			0			0			0			0	
	Maintenance			0			0			0			0			0	
	Transport Equipment			0			0			0			0			0	
	Vehicles			0			0			0			0			0	
	Aircrafts			0			0			0			0			0	
	Boats			0			0			0			0			0	
	Motorcycles			0			0			0			0			0	
Indicative estimates based on best available information	Other (Please specify)			0			0			0			0			0	
	Other Equipment			0			0			0			0			0	
	Offices/Desks			0			0			0			0			0	
	Chairs			0			0			0			0			0	
	Archive Office Equipment			0			0			0			0			0	
	Conference Room Furniture			0			0			0			0			0	
	Other (Please specify)			0			0			0			0			0	
	Recurrent outlays O & M			**0**			**0**			**0**			**0**			**0**	
	Staff			0			0			0			0			0	
	Officials			0			0			0			0			0	
	State Officials			0			0			0			0			0	
	Administrative Staff			0			0			0			0			0	
	Workers			0			0			0			0			0	
	Assignment of Work			0			0			0			0			0	
	Operating Costs			0			0			0			0			0	
	Rents			0			0			0			0			0	
	Electricity			0			0			0			0			0	
	Water Supply Projects			0			0			0			0			0	
	Maintenance			0			0			0			0			0	
	Supplies			0			0			0			0			0	
	Other (Please specify)			0			0			0			0			0	
	Total Project Cost			**0**			**0**			**0**			**0**			**0**	
	Budget Provision																

Annex 4: Checklist of Questions for Appraising a Public Investment Project Proposal on the Basis of Feasibility Study

1. Clarity of objectives

1.1 Are the project rationale, background, policy context and strategic fit covered in the Feasibility Study and clearly explained and justified?

1.2 Are the objectives consistent with the strategic aims and ultimate objectives as set out in, for example, ministerial programs and statements of government policy?

1.3 Does the proposal focus on outputs (generally services to the public), as opposed to inputs, and how these outputs contribute to the specified project purpose and ultimate goal?

1.4 Are the objectives - outputs, purpose and goal - defined in specific and measureable terms and with deadlines so that their subsequent achievement can be evaluated?

2. Choice and definition of alternatives

2.1 Is the range of project alternatives being considered wide enough, paying sufficient attention to, for example: quantity or quality of outputs/services; timing or phasing of investment; location of investment? Has the do-nothing (or do-minimum) alternative been explicitly considered?

2.2 Have any potentially promising alternatives been ruled out before detailed appraisal on the grounds of technical feasibility or other constraints (e.g. legal, political or financial)? If so, is the justification clear or could these constraints be questioned?

2.3 Can any of the project alternatives be split into independent components for separate appraisal? (A proposal may have separable components which provide much better value than others.)

3. Estimation of costs and benefits

3.1 In estimating the costs and benefits of the project, has account been taken of:

- Capital (including physical contingencies) and operating costs, staff costs (including overhead costs), maintenance, administration fees, rates etc.?
- Other costs and benefits which can be valued in money terms e.g. cost savings, non-marketed impacts?
- Quantified measures or at least descriptions of those costs and benefits which cannot be easily valued in money terms?

3.2 If certain costs or benefits are not quantified in monetary terms is this appropriately justified?

3.3 Are there any decisive unquantified costs or benefits and are these clearly explained?

4. Economic valuation of costs and benefits

4.1 Have all costs and benefits of the project been expressed in constant prices and discounted at the appropriate rate? Has account been taken of any relative price effects where they may be important?

4.2 Have costs been properly estimated? For example:

- Opportunity/resource costs used to value goods?
- Sunk costs omitted, but opportunity cost of already-owned assets included?

- Residual values included for long-lived project components?

4.3 Have adjustments been made to exclude transfers from economic values: (i) indirect taxes; (ii) subsidy payments excluded from economic values?

4.4 Have financing items and sources been excluded from cash flow analysis?

4.5 Are second-round effects properly justified and has double-counting of costs or benefits been avoided?

5. Economic analysis

5.1 Have the results of each project alternative been presented clearly, including the do-nothing (or do-minimum) alternative?

5.2 Is the time period for the socio-economic cost-benefit analysis long enough to encompass all important costs and benefits? Or has adequate account been taken of subsequent costs and benefits? Is the timing of all costs and benefits clear for each alternative?

5.3 Have the net present value (NPV) and/or economic internal rate of return (EIRR) been calculated? Do results of the economic analysis indicate that the project is economically feasible, meaning that the NPV is positive or the EIRR is above the prescribed minimum rate of return for public sector investment?

5.4 Are the results of the economic analysis robust in the face of more pessimistic assumptions concerning key values (as examined in sensitivity tests) and the worst-case scenario?

5.5 If monetary values cannot be estimated for economic benefits has a cost-effectiveness analysis been performed? Does the cost-effectiveness analysis confirm that the selected alternative has the lowest present value of costs per unit output compared to other project alternatives? Is there a strong qualitative case made for the economic benefits? Do the results of multi-criteria analysis lend strong support to the case for the investment in the capital project?

6. Assessment of project risk and uncertainty

6.1 If forecasts have been used are these reliable and what is their likely degree of accuracy?

6.2 Have all important risks and uncertainties been identified for each project alternative and assessed - either qualitatively or quantitatively?

6.3 Have key assumptions been identified and either considered reliable or treated as a risk for monitoring and mitigation?

6.4 Has appropriate sensitivity analysis been used, including a worst-case scenario? Are other methods of risk assessment also appropriate?

6.5 Is ongoing monitoring of risks and appropriate risk mitigation included in the budget and activity plans?

7. Financial analysis

7.1 If the project is commercial or has revenue-earning potential is there still a case for a budget capital subsidy? If budget funding for capital investment is justified, will the operating entity nevertheless be able to generate sufficient financial resources to cover operations and maintenance?

7.2 What are the impacts of the project on the income-expenditure account, balance sheet and cash flow of the operating entity? Will the project contribute to the financial objectives of the operating entity, taking account of proposed budget subsidies for capital investment?

7.3 If the project is to be financed from multiple sources, is the funding from sources other than the budget likely to be secured?

7.4 Has the overall impact on the public finances been assessed separately from the economic analysis, including any contingent liabilities or state guarantees?

8. Implementation management and operational analysis

8.1 Does the project have the characteristics that recommend consideration of procurement through a public-private partnership arrangement and, if so, has this option been investigated or highlighted for further consideration, including value for money analysis.

8.2 Is the project proposal practically deliverable and are there well-defined and realistic delivery plans with clear delivery dates and implementation milestones for monitoring purposes?

8.3 Has responsibility been clearly allocated for project outputs and expenditure?

8.4 Have operational requirements, such as staff and accommodation, been identified and budgeted?

8.5 Does the implementing organisation have the capability to develop itself or procure the proposed project outputs?

8.6 Is implementation of the project compatible with other projects and workloads being undertaken by the implementing organisation?

8.7 Are the assigned responsibilities, mix of skills and decisiveness of the project steering group appropriate to the project's risks?

8.8 Will adequate financial and human resources be available for project rollout, handover and operations?

9. Environmental and Social Consequences

9.1 Have the major environmental and social consequences of the project been properly identified and appropriate mitigation measures designed where required?

9.2 Taking account of any proposed mitigation measures, has sufficient evidence been provided to indicate that the project will be environmentally sustainable?

9.3 Taking account of any proposed mitigation measures, has sufficient evidence been provided to indicate that the project will be feasible from a social perspective?

10. Presentation of results

10.1 Have the results been clearly presented? Is it clear who will benefit and who will bear the cost of each project alternative?

11. Monitoring and Evaluation

11.1 Does the project plan include satisfactory implementation monitoring arrangements – who, when, how, costs?

11.2 Does the project plan include clear proposals for evaluating project performance once the project is operating - who, when, how, costs?

Annex 5: General Template for a Feasibility Study

The exact contents of a feasibility study will vary by sector. Annex 2 gives some indication of the issues that will need to be addressed in certain key sectors.

1. **Executive Summary**
   - Summarise the key findings of the feasibility study and recommendations aimed at high-level decision-makers.
2. **Analysis of the Existing Context for the Project**
   - Review the context for the project, including the current institutional framework.
   - Summarise government policy in the sector/sub-sector in which the project belongs and the respective roles of the State and the private sector.
   - Describe the role of the Economic Entity in the sector/sub-sector and how it became involved in the project. If there have been any previous attempts to initiate the project, explain why these failed.
   - Summarise the findings and conclusions of any preliminary or previous studies, including the pre-feasibility study where relevant.
3. **Examination of Project Alternatives**
   - Assess the level and quality of existing public services to be improved by the project and identify any shortcoming or deficiencies, for example, poor quality services or bottlenecks or interruptions in service delivery.
   - Consider the levels of service mandated in government policy compared to existing services.
   - Identify who uses and needs the services, so that target users can be identified, for example, target users can be defined geographic location or socio-economic category.
   - Examine the different alternatives for meeting the identified needs for the relevant service. Alternative might include: regulatory changes or improved sector management practices, and no investment; rehabilitating existing facilities; or building completely new facilities.
4. **Market Assessment and Demand Analysis**
   - Provide a forecast of the potential demand for the defined outputs (services) among the target users of the project and of the expected growth in this demand over the lifetime of the project. Include an estimate of any suppressed demand that is currently not being met because of insufficient coverage or service quality.
   - Present estimates of the willingness and ability to pay for the services by potential users, where relevant.
   - Present forecasts as scenarios representing different possible outcomes, including the most likely outcome and the worst-case scenario.
5. **Summary of Technical Studies and Project Costs**
   - Provide a technical description of the engineering and non-engineering aspects of the project. This should summarise the technical and technological studies undertaken to assess the technical feasibility of the project and alternatives. Detailed studies should be appended to the Feasibility Study.

- Identify the input parameters for the project and their prices, including labour costs for construction and operation of the project.
- Provide detailed estimates of capital and operating and maintenance costs. Capital cost estimates will be on the basis of the preliminary technical design.

6. Spatial Planning

- Review spatial planning issues in relation to the project and its location. Summarise the implications for the project of local and national spatial plans.
- Describe the steps proposed to ensure conformity with the plans. Identify the official approvals required to proceed with the project.
- Set out the land acquisition requirements of the project and the procedures and timetable for meeting these requirements. Land acquisition and obtaining approvals must be factored into the project implementation plan.

7. Economic Analysis

- Present the economic analysis approach - economic cost-benefit analysis or, where appropriate, cost-effectiveness analysis
- Identify and value relevant and material costs and benefits
- Describe the data inputs, estimation techniques and assumptions used
- Present results of economic analysis for the proposed project compared to realistic project alternatives and the do nothing alternative,
- Append detailed workings and any economic modelling undertaken for the Feasibility Study to the main report.

8. Financial and Fiscal analysis

- Present the financial analysis of the proposed project and the results of the assessment of financial sustainability of the operating entity, describing the data inputs and assumptions used to arrive at these results.
- Present an assessment of the net impact on the public finances, including changes in tax revenues, of the proposed project during construction and during operation.
- Append detailed workings and any financial modelling undertaken for the Feasibility Study to the main report.

9. Risk analysis and management

- Identify the main sources of risk for the project and assess their impact on the economic feasibility and financial performance of the project and their likelihood.
- Present a plan for managing the key risks, including mitigation measures and reactive measures for if the risks should occur.

10. Environmental and Social Impacts

- Summarise the environmental and social impacts, both positive and negative, of the project.
- Append full environmental and social impact assessments, where undertaken, to the Feasibility Study report.

11. Implementation and Operational Arrangements

- Present an assessment of the capabilities of the organisation(s) responsible for implementing and/or operating the project.
- Set out the outline plan and timetable for implementing the project, indicating key milestones in detailed planning, approval and construction.
- Describe the project management arrangements, including the organisational arrangements and the allocation of responsibilities between the different parties involved.
- Outline the organisational arrangements and allocation of responsibilities for operating and maintaining the project once completed.

12. Conclusions on Project Feasibility

- Summarise and interpret the findings of the preceding analyses to arrive at a conclusion concerning the technical and economic feasibility of the project, its sustainability and the associated risks.
- Make recommendations to decision-makers

Annex 6: Template for a Project Appraisal Report

1. Project Context (5 pages)

1.1 Project Summary

- Provide a brief description of the project and name the entities responsible for implementation and operation.
- Give the name and position of the senior responsible officer for the project.

1.2 Project Objectives and Scope

1.2.1 Intervention Logic

- Describe the underlying problem or opportunity motivating the project.
- Explain how the project will address the problem or respond to the opportunity.
- Summarise the process by which the project was identified, including consultations with relevant stakeholders.
- Set out the reasons why the private sector cannot be expected to address the problem or respond to the opportunity, and why a public sector intervention is therefore necessitated.

1.2.2 Strategic Relevance

- Identify the relevant goal(s) in the Statement of Government Strategy to which the project will contribute. Explain the contribution.
- Identify the goals and departmental objectives in the relevant ministry Strategic Plan Outline to which the project will contribute. Explain how the project will contribute.

1.2.3 Project Objectives

- Using SMART terminology, define:
  - the overall objective of the project, ensuring that it is consistent with the goals mentioned previously;
  - the project purpose; and
  - the project outputs, or the deliverables for which project management and ultimately the senior responsible officer will be accountable.
- Highlight any critical constraints that must be removed or assumptions that must hold, including dependencies on other government projects or actions, for achieving the intended objectives.

1.2.4 Project Scope

- Provide a detailed description of the project, listing all the project outputs and the main activities required to deliver each of them. Where necessary, refer to the technical part of the Feasibility Study and accompanying design studies.

1.3 Project Alternatives

- Briefly summarise the long-list of alternatives considered at Pre-Selection Stage and identify the short-list of alternatives carried forward to appraisal stage, together with any new alternatives introduced at this stage.

- Indicate the main technical differences between appraisal alternatives in terms of outputs and activities, referring where necessary to the relevant sections of the Feasibility Study.

1.4 Demand for Project Services

- Summarise the main features of the demand forecasts:
  - Methodological approach;
  - Base-year demand;
  - Trend growth rates and forecasts;
  - Demand generated by the project; and
  - Key assumptions and risks underlying the demand forecasts.

2. Economic Analysis (12 pages)

2.1 Benefits and Costs (4 pages)

2.1.1 Economic Benefits

- Identify the main economic benefits of the project distinguishing between tangible benefits, i.e., those that can be valued directly using market prices, and intangible benefits, i.e., those that cannot be valued directly using market process.
- For intangible benefits, further distinguish between those for which values have been estimated and those for which they have not. Give a brief explanation of why intangibles have not been valued.
- Further distinguish benefits according to whether they accrue to:
  - The operating entity;
  - Users of the project services; or
  - Parties external to the project.
- Indicate any important differences in benefits between project alternatives.

2.1.2 Economic Costs

- Identify the main economic costs of the project, such as:
  - The direct costs of the project distinguishing between investment costs and life-cycle maintenance and operating costs.
  - Capability development costs for operations.
  - Mitigation costs for environmental harm or social dislocation, referring to relevant sections of the Feasibility Study and Environmental and Social Impact Assessments.
  - Significant opportunity costs not reflected in market transactions, e.g., use of publically owned assets
  - Any dis-benefits of the project not borne by the operator, such as negative externalities falling on third parties.
- Indicate any sunk costs that have been excluded.

- Describe any significant differences in the costs of alternatives, referring to the relevant sections of the Feasibility Study and/or technical studies.

2.2 Valuing Benefits and Costs (4 pages)

- Give the main valuation assumptions used, such as the price base and the base-year for present value calculations.
- Summarise the adjustments made to market prices to reflect opportunity costs, referring where necessary to relevant sections of the Feasibility Study for details
- Outline briefly the methods used to value intangible benefits and costs, referring where necessary to relevant sections of the Feasibility Study for details.
- Summarise the economic values estimated as a basis for net cash flow calculations
- Explain the relative importance of benefits and costs for which it has not been feasible to estimate monetary values, identifying those for which some form of quantification has been possible and those which can only be discussed in qualitative terms.

2.3 Estimation of Net Present Values (2 pages)

- Summarise how cash flows have been built up from economic values and demand estimates.
- Present the cash flows, net cash flow and discounted net cash flow for each project alternative. (If there are many complex alternatives cash flows may be annexed and the results summarised in tabular format in the main report.)
- Present the results of the net present value calculations or net present cost calculations where cost-effectiveness analysis has been performed.

2.4 Risk Analysis (2 pages)

- Summarise the results of the minimum requirements for sensitivity analysis for each project alternative and present conclusions concerning the robustness of the quantitative economic analysis in the face of more pessimistic assumptions.
- Present the results of any additional sensitivity analysis
- Explain any further in-depth risk analysis performed as a result of sensitivity analysis and summarise the findings.
- Summarise the key risks still facing the project, after taking account of mitigation measures, and explain how they will be monitored and how and by whom they will be managed should they occur. Where necessary refer to the risk management plan for more detail.

3. Comprehensive Project Appraisal (8 pages)

3.1 Affordability and Sustainability (6 pages)

3.1.1 Financial Analysis

- Summarise the financial analysis performed in the case of a revenue earning projects. Where necessary, refer to the relevant sections of the Feasibility Study.
- Describe the findings of the analysis concerning the financial sustainability of the project and of the operating entity, highlighting any critical weaknesses.
- Present the findings on financial profitability in the case of a commercial project.

3.1.2 Budgetary Impact

- Indicate the expected net budgetary impact of the project during implementation and over its lifetime.

3.1.3 Institutional/Managerial Sustainability

- Present the findings of the assessments of the capabilities of the implementing and operating organisations and demonstrate how any identified weaknesses have been, or will be, made good.
- Summarise the implementation plan, highlighting the expected implementation period and the key milestones on the way to completion.

3.1.4 Environmental and Social Sustainability

- Describe any significant environmental or social impacts or potential impacts, beyond those captured in the economic analysis, which could seriously damage or enhance the long-term sustainability of the project. Where necessary, refer to the draft environmental and social impact assessments for details, when these exist.
- Indicate what mitigation measures are planned to counteract negative environmental or social impacts and their expected effect.

3.2 Summary Findings and Recommendations on Preferred Project (2 pages)

- For each project alternative, summarise the key elements for a comprehensive appraisal:
  - Net present value (or net present cost).
  - Robustness of the quantitative economic analysis in the face of more pessimistic sensitivity assumptions
  - Importance of benefits and costs for which monetary values have not been estimated.
  - Sustainability factors:
    - Financial
    - Budgetary
    - Environmental and social
    - Management
- Make a recommendation for the preferred project alternative explaining the basis for the recommendation with reference to the elements of the comprehensive appraisal.

Annex 7: Template for Project Concept Note for Non-Financially Significant Projects (> euro 0.5 million, ≤ 5.0 million)

Part A: Basic Information and Analysis

Information Requirement	Response	Source of Evidence/Additional Comments
A. Administrative Information		
1. Project name		
2. Economic entity submitting the project		
3. Senior official responsible for the project within Economic Entity		
4. Subordinated entity responsible for project and its implementation (if different from Economic Entity)		
5. Responsible official in subordinated entity (if applicable)		
B. Project Rationale and Assessment of Need		
a. ***Intervention Logic***		
6. Describe the specific problem that the project is intended to address and its severity. Where possible quantify the problem.		
7. Explain how the project will alleviate this problem. Where relevant give the standards that should be met.		
8. Describe the short list of alternative ways of addressing the problem which has been considered. (including the do nothing or do minimum option)		
b. ***Needs Assessment***		
9. Identify the specific target group intended to benefit from the project.		
10. Indicate how many end-users there will be for the services provided by the project. Specify the unit of measurement of users (e.g., individuals, households, businesses).		
11. Provide a preliminary estimate of the physical demand for the services provided by the project on		

Information Requirement	Response	Source of Evidence/Additional Comments
completion and an estimate of how fast this demand is expected to grow. Specify the unit(s) of measurement of demand (e.g., cubic metres of water per day, vehicles per day, clients per day, etc.).		
12. Specify the approximate physical capacity of the proposed facilities, indicating the unit(s) of measurement e.g., cubic metres of water per day, vehicles per day, square metres of useable space, clients served per day, etc..(physical capacity should be expressed in the same unit of measurement as the physical demand is expressed in question 11)		
c. ***Project Scope***		
13. Describe the project and its components and explain how these represent a comprehensive solution. Wherever relevant mention the physical characteristics of the project, the location and size of the project, the type of the establishment, the current use of land, the type and altitude of the area where the project will be executed, the dimensions and capacity of the project and report the presence of any Natura 2000 areas and special interest areas.		
C. Strategic Case		
14. Indicate how the project will contribute to the achievement of the Government's strategic goals and to the achievement of the goals and objectives of the Economic Entity. Provide any programme documents supporting the selection of specific project priorities.		
D. Preliminary Economic Case and Options Analysis		
a. ***Project Implementation Costs***		

<table>
<tr><th>Information Requirement</th><th>Response</th><th>Source of Evidence/Additional Comments</th></tr>
<tr><td>15. Provide an indicative estimate of the total estimated capital cost of the project and relevant alternatives, including technical variants, in current prices. Capital costs to include all implementation costs, up to project completion, required to deliver anticipated benefits to end-users. If possible, include any environmental mitigation measures that are planned.
Extend table as necessary for alternatives. For the completion of this table, where alternative project options involve capital expenditure, please use the excel sheet provided in Annex 3 and submit it to DG EPCD. The excel sheet should be provided for each alternatives.
For alternative project options that do not involve capital expenditure fill in column “Basis for Estimations” in the table.
For these project options report unit costs or any supporting documents for the estimation of costs.
Provide unit cost of a similar completed project.</td><td><table><tr><th></th><th>Total</th><th>Basis for Estimations [131]</th></tr><tr><td>Reference project</td><td></td><td></td></tr><tr><td>Alternative 1</td><td></td><td></td></tr><tr><td>Alternative 2</td><td></td><td></td></tr><tr><td>Alternative 4</td><td></td><td></td></tr><tr><td>Etc.</td><td></td><td></td></tr></table>Project Unit Cost:

Unit Cost of a Similar Completed Project:</td><td></td></tr>
<tr><td>16. Provide an estimate of the cost of further design work or any statutory impact assessments.</td><td></td><td></td></tr>
<tr><td colspan="3">b. Project Benefits</td></tr>
<tr><td>17. Identify the main benefits to the users of the assets that will be created by the project.</td><td></td><td></td></tr>
<tr><td>18. Identify any significant externalities, i.e., benefits or costs to non-users.</td><td></td><td></td></tr>
<tr><td>19. Explain any significant differences in benefits between project alternatives. Mention the findings of multi-criteria scoring and weighting, if applied.</td><td></td><td></td></tr>
<tr><td colspan="3">c. Economic Viability</td></tr>
<tr><td>20. Provide an estimate of the capital cost per user or capital cost per unit of demand for the final</td><td></td><td></td></tr>
</table>

[131] Should be completed only for alternative project options that do not involve capital expenditure.

Information Requirement	Response	Source of Evidence/Additional Comments
service. (both if possible)		
21. Indicate how these costs compare with the costs of project alternatives and with other similar, recently completed projects. (capital cost per user or capital cost per unit of demand)		
22. Explain why the reference project is expected to represent a worthwhile use of public resources compared to alternatives (including doing nothing), on the basis of available information on costs and benefits. This section should be a summary of the analysis undertaken in the PCN so far. A statement verifying that: the project addresses a clearly identified need, is in line with Government policy and the Ministry's priorities, will deliver significant benefits to citizens that are greater than those of alternative project options and the capital cost looks reasonable compared to other similar projects		
23. Describe the main risks and assumptions that could potentially affect the economic viability of the project. Identify any mitigation measures that are planned or explain how key risk will be managed should they occur.		

E. Affordability

Show the projected budgetary impact of the project both during the period of preparation, design, implementation and the period of its operation. Extend or contract the tabular format as necessary to capture the full construction period and two years post-construction. Approximate estimates only are expected, based on best available information. For the completion of this table please use the excel sheet provided in Annex 3 and submit it to BD MoF

24.

[1] Budget Expenditure Savings: Report any savings that might incur from the implementation of the project e.g. saving rents from the construction of a new building or saving maintenance/fixing expenditure of an old costly equipment as a result of the purchase of new equipment.

	Year 1	**Year 2**	**Year 3**	**Year 4+**	**Completion year +1**	**Completion year + 2**	**Outer year (average)**
	Construction period				Operation period		
TORs and Designs							

[2] Budget Provision: Report the budget amount that is required to implement the project. In some cases budget expenditure is allocated in more than one Ministry/Department e.g. expropriations, in these cases the entire amount must be included, including expropriations, with a footnote explanation on the cost of expropriations.	Purchase of Land							
	Capital outlays							
	Recurrent outlays (O & M)							
	Total Project Costs							
	Budget Expenditure Savings 1 Head --							
	Budget Provision 2 Head --							
	Revenues							

25. If matching funding from local government or self-financing public agencies is expected to be required, provide some evidence that adequate budgetary provision can and will be made.		
F. Implementation		
a. ***Procurement***		
26. Identify any issues that will need to be taken into account when planning for procurement.		
b. ***Implementation Arrangements and Potential Constraints***		
27. Summarise the proposed arrangements for overseeing and/or managing project implementation.		
28. Indicate the proposed implementation timetable, including dates for milestones. [Implementation		

plan to be appended.]		
29. Provide evidence that the organisation responsible for overseeing and/or managing implementation has adequate capabilities for implementing a project of the proposed scale and nature.		
30. Identify any potentially critical constraints that will need to be overcome, e.g., environmental restrictions or land acquisition, or additional measures, including legislative changes, that will need to be put in place before the project can be successfully implemented. Indicate the planned steps for doing this.		
G. Sustainability Issues		
31. Specify the organisation which will own and operate the asset created by the project.		
32. Provide evidence that the organisation responsibility for operating and maintaining the capital asset will have adequate technical, managerial and financial capacity to do so. If this is not the case, specify what measures are planned to create the necessary capabilities.		
33. Explain how operating, maintenance and depreciation expenses will be covered once the project is completed, including any changes to user charges or user charging policy that may be necessary.		
34. Describe any significant environmental impacts and proposed mitigation measures, where foreseen.		
35. Describe any significant social impacts, particularly those relating to the allocation of costs and benefits between the various project stakeholders, and proposed mitigation measures, where foreseen.		
H. Approach to Further Studies		
36. Describe the next steps in project design and preparation for procurement.		
37. Describe any statutory impact studies that must be		

completed prior to commencement of implementation.		
38. Identify whether there is a legal requirement for an environmental impact assessment or/and an adequate evaluation to be performed.. Information to be provided: -parcel (s) size -planning zone of the parcel(s) -proximity of nearest activities -proximity with Natura 2000 area(s) -brief description of project including the major technical aspects (technology) to be used -significant negative environmental impacts -significant positive environmental impacts -main environmental aspects to be considered: land use (change) biodiversity (flora and fauna) soil air (ambient air, point-source) water (underground, inland, coastal) minerals waste production noise climate change (mitigation / adaptation) social aspects (social acceptance or not)		

Part B: Qualitative Comparison of Project Alternatives

Criteria	Reference Project*	Alternative 1*	Alternative 2*	…Alternative n*
Viability Criteria				
1. Meeting needs: Extent to which the alternative represents a comprehensive response to the identified needs.				
2. Economic viability: Extent to which the alternative optimises benefits and delivers a return on the required spending – investment and life-cycle costs – from the perspective of the operating entity and society as a whole.				
3. Reliable implementation arrangements: Extent to which the alternative is commensurate with the capabilities of the implementing organisation				
4. Risk management Extent to which any significant risks associated with the alternative can be mitigated and/or managed				
Sustainability Criteria				
5. Operational sustainability: Extent to which the alternative is commensurate with the capabilities of the operating entity.				
6. Long-run budgetary impact: Extent to which future operations and maintenance expenditures are in line with realistic budgetary expectations or finances of the operating entity.				
7. Environmental and social sustainability Extent to which any significantly negative environmental and social impacts can be mitigated and/or managed.				

*Criteria to be rated ‘marginal’, ‘moderate’ or ‘substantial for each alternative.

Part C: Assessment of the Quality of the Preferred Alternative

Dimensions/Judgement Criteria	**Yes**	**No**
A. General		
1. The information provided in the PCN-Appraisal Version is adequate to give an appraisal opinion.		
2. It is clear which organisation is implementing the project and who will ultimately be responsible for delivering the project on time and to budget.		
B. Project Rationale and Assessment of Need		
3. The problem or opportunity to be addressed is clearly demonstrated and the way in which the project will help solve the problem or respond to the opportunity is explained and makes sense.		
4. The description of the scope of the project is sufficiently detailed for appraisal stage and there are no obvious omissions of major components that could potentially jeopardize the achievement of the project purpose.		
5. There is an urgent need, i.e., within the next 3 years, for the services of the project as demonstrated by evidence of one or more of the following: • existing demand for a facility close to the end of its economic life or technologically obsolescent; • a severe capacity constraint in existing facilities resulting in suppressed demand; • strongly growing demand, likely to outstrip the capacity of existing facilities in the near future; or • demand for new services not previously provided.		
C. Strategic Case for the Project		
6. The project will make an important contribution to the achievement of relevant strategic goals and objectives as set out in approved national or ministry strategic plans or other such documents.		
D. Preliminary Economic Case and Analysis of Alternatives		
7. The proposed technical solution is appropriate to the problem identified, i.e., the envisaged technology is neither too advanced nor over-specified.		
8. The qualitative assessment of project benefits is convincing and the target beneficiaries represent a clear priority for government.		
9. Benefits to users are likely to be achievable at an acceptable cost, for example, capital costs per user or per unit of output are in line with comparable projects and/or international experience.		
10. On balance, there is good reason to believe that the proposed project costs are likely to be exceeded by the potential benefits.		

11. Alternative solutions have been considered and a strong case has been made for the preferred project		
E. Fiscal and Financial Sustainability		
12. The medium- to long-term budgetary impact of the project is not inconsistent with budgetary projections and trends, taking into account the existing commitments of the economic entity proposing the project.		
13. If the project is to be implemented and operated by a self-financing economic entity, its financial overall position - cash flow and solvency - is sound and likely to remain so.		
F. Implementation Arrangements		
14. The responsible implementing agency has the necessary capacity to deliver the project or is very likely to be able to make good any non-critical weaknesses before implementation begins.		
G. Sustainability Issues		
15. The sustainability of the project is unlikely to be compromised: • By a shortage of funding for operations and/or maintenance; or • By critical weaknesses in the capacities of the operating entity which are unlikely to be resolved in time for project completion.		
16. There are no unacceptable environmental and social impacts for which satisfactory mitigation measures have not been planned.		
H. Approach to Further Studies		
17. Requirements for design studies and any statutory assessments, e.g., environmental impact assessment, are clearly identified.		