Connecting Europe Facility (CEF)

CINEA Guide on economic appraisal for CEF-T transport projects

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IMPORTANT NOTICE

This document is designed to help **beneficiaries** determine the scope of the cost-benefit analysis when applying for CEF2 Transport calls for proposals.

HISTORY OF CHANGES		
Version	**Publication Date**	**Change**
1.0 DRAFT	04.10.2021	▪ Initial version (new MFF).
1.0	15.07.2022	▪ Revised version by DGT Editors. Update of HECT values.
2.0		
3.0		

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1. Obligation to include a cost-benefit analysis

Proposals for funding under CEF-T that include works must include a cost-benefit analysis (CBA).

A full analysis must contain:

- a standalone text **document of at least 20 pages**
- the filled-in full CBA cash flow template.

No CBA

You do NOT need to submit any analysis (not even a cost-effectiveness analysis) if your proposed project:

- relates to **smart and interoperable mobility** or the **reduction of rail freight noise** or
- is presented with the support of an **implementing partner** under the **Alternative Fuels Infrastructure Facility** (CEF-T AFIF) or
- relates to **civil-defence dual-use** activities.

Instead, in these cases you must enter all the details of the socio-economic impact in **Part B of the Application Form**.

Simplified cost-benefit analysis

You can provide a *simplified* cost-benefit analysis if:

- the eligible costs of your proposed project do **not exceed EUR 10 million**, or
- your proposed project is presented under the **Alternative Fuel Infrastructure Facility** (CEF-T AFIF) with the support of a **financial institution** (other than an implementing partner).

For a simplified analysis you do not need to provide a standalone text document. Instead of the cash flow template, you use the simplified CBA calculator. This requires fewer inputs to produce the output indicators, because it automatically calculates externalities and monetises time savings.

⚠ You always have the option to submit a full cost-benefit analysis instead.

Projects with multiple phases

If you are applying for a **new phase** of a project that had already begun and for which other construction phases were/are supported by the current or previous programme, you can re-submit the cost-benefit analysis that you originally submitted — if:

- this new project was already included in your original analysis
- no significant changes have occurred that may impair the validity of the original cost-benefit analysis (for details, *see section on Time frame for the analysis in annex 1*)

If you take this option, you must confirm (in Part B, section 4.2 of the Application Form) that these 2 conditions are met.

If no cash flow template was required at the time of your original submission, you must fill one in for the new application.

An overview of the various requirements for each priority is summarised in the table below.

Work programme objectives	Priorities	Requirement
Projects related to efficient, interconnected, interoperable and multimodal networks		
	Railways	Full CBA / Simplified if < EUR 10 million of eligible costs
	Inland waterways and inland ports	Full CBA / Simplified if < EUR 10 million of eligible costs
	Maritime ports	Full CBA / Simplified if < EUR 10 million of eligible costs
	Roads, rail-road terminals, connections to airports and multimodal logistics platforms	Full CBA / Simplified if < EUR 10 million of eligible costs
Projects relating to smart, interoperable, sustainable, multimodal, inclusive, accessible, safe and secure mobility		
Projects related to smart and interoperable mobility	ERTMS (European Rail Traffic Management System)	No CBA
	ITS (Intelligent Transport Systems)	No CBA
	RIS (River Information Systems)	No CBA
	SESAR common projects (Single European Sky Air Traffic Management Research)	No CBA
	SESAR other projects	No CBA
	Transport interoperability	No CBA
Projects related to sustainable and multimodal mobility	Alternative fuels infrastructure (AFIF)	Implementing partner: No CBA Others: Simplified CBA
	Motorways of the Seas	Full CBA / Simplified if < EUR 10 million of eligible costs
	Multimodal passenger hubs	Full CBA / Simplified if < EUR 10 million of eligible costs

	Reduction of rail freight noise	No CBA
Projects related to safe and secure mobility	Safe and secure parking infrastructure	Full CBA / Simplified if < EUR 10 million of eligible costs
	Road safety	Full CBA / Simplified if < EUR 10 million of eligible costs
	Projects improving transport infrastructure resilience	Full CBA / Simplified if < EUR 10 million of eligible costs
	External border checks	Full CBA / Simplified if < EUR 10 million of eligible costs
Military mobility		
	Military mobility	No CBA

2. Cost-benefit analysis

2.1 General rules

The analysis must comply with a methodology recognised by the Member State(s) in which the project will take place.

You can be sure of this if you follow the DG REGIO Guide to Cost-Benefit Analysis of Investment Projects and DG REGIO CBA Economic Appraisal Vademecum. These documents complement the CBA methodology and support in particular the early screening of investments. They are based on established good practices at EU and Member State level, and coordinated with economic appraisal approach of the European Investment Bank (EIB).

⚠ Regardless of which methodology you use, the rules in this guidance note are mandatory.

Your analysis must contain separate financial and economic analyses of the project, each supported by results from feasibility studies that include (i) demand and option analyses, (ii) sensitivity analysis and (ii) risk assessment.

⚠ Where possible your analysis and all the documents in it should be in English.

If the cost-benefit analysis has been carried out on a bigger scope than your specific project (for example, the global project), explain how the analysis is relevant to your specific project, drawing concrete conclusions for your project as much as possible.

For detailed guidance on how to define the appropriate scope of the cost-benefit analysis, *see annex 1*.

2.2 Economic analysis

This part of the cost-benefit analysis is designed to assess your project's **net impact on society** and confirm whether it is worth EU co-financing (because socio-economically viable).

It must reflect all the ***direct*** effects of the project, in the following categories:

- **investment costs** — including both the initial investment and the replacement costs during the entire period of analysis, and their corresponding residual values
- **benefits for transport users** (‘*consumer surplus*’) — related to the benefits of using the goods or services provided in all affected transport modes. Typically, these will include savings in travel times and costs for users
- **operating costs and revenues** (‘*producer surplus*’) — the net amount by which producers benefit from producing and selling a quantity of a product. Typically, this may include cost savings for commercial freight vehicles or cost optimisation by public transport suppliers (e.g. due to faster commercial times or reduced travel distances)
- **externalities** — spillover effects from the project towards third parties (neither consumers nor producers), for which no monetary compensation is provided. Examples are environmental effects (air and noise pollution, climate change, etc.) or positive externalities such as prevention of fatalities, injuries or accidents. For details, *see the Handbook on external costs of transport (HECT) (and its annexes)*.

For a more detailed description of these categories, *see chapter 3 of the DG REGIO Guide to Cost-Benefit Analysis of Investment Projects*.

As a **minimum** you must provide the following socio-economic information on your project:

- main economic benefits (fuel savings, CO2 emission savings, productivity gains, delay savings, time savings, vehicle operating cost savings, accident savings, reduction of greenhouse gases and non-greenhouse emissions, reduction of noise emissions, quality of service improvements)
- project's economic net present value (ENPV)
- project's economic rate of return (ERR)
- social discount rate used *(— explaining why you chose it*)
- time horizon (reference period — *explaining why you chose it*).

In line with the DG REGIO Guide to Cost-Benefit Analysis of Investment Projects, your analysis should **not include indirect or wider effects** such as**:**

- effects on markets other than transport (except in very rare cases when they are considered to be substantial or a major factor in the decision to implement the project)
- output change in imperfectly competitive markets
- agglomeration effects
- tax implications of a move to more productive jobs.

Methodology

Please also include a brief description of the methodology you have used and the steps taken in calculating the following:

- fiscal corrections
- conversion of market prices to accounting (shadow) prices
- monetisation of non-market impacts (corrections for externalities).

You should follow the incremental analysis method and the discounted cash flow methodology.

2.3 Financial analysis

The financial analysis addresses the project's financial profitability and sustainability.

It must measure:

- financial profitability, measured by the financial net present value (FNPV) of the planned investment and the financial rate of return (FRR)
- financial profitability assuming the EU support is provided, based again on the FNPV and FRR
- a calculation of the estimated cumulative net cash flow for the project over the chosen time horizon, demonstrating that this remains positive at all times (financial sustainability).

For details on how to define the appropriate scope for the financial analysis, *see annex 1*.

The financial analysis should be consistent with the assumptions underlying the socio-economic analysis *(see previous section)*.

Time horizon

You must use the same time horizon for as for the economic analysis: both must reflect the project's economic life, regardless of the duration of the commercial contract or regulatory framework (for example it could go beyond a concession period).

Your analysis must include FAQs relating to the project lifespan and other linked notions (e.g. residual or terminal value).

Financial discount rate (FDR)

You must state this rate and explain why you chose it.

You can use a rate that exceeds the value recommended in cost-benefit methodologies for public investment, such as in the DG REGIO Guide to Cost-Benefit Analysis of Investment Projects (i.e. 4%).

But if you do this, you must provide:

- evidence explaining why you selected this rate *(if possible, using market references, the internal rate of return for the sector and the sector's weighted average cost of capital (WACC), and how you calculated this, etc.)*
- an indicative calculation of the financial net present value (FNPV) based on the recommended discount rate
- if the financial discount rate used exceeds the WACC: an explanation of why the project is comparatively more risky than your average risk profile, and what are the other business segments (and their relative size) which are comparatively less risky than the one to which project belongs.

Revenues and costs

Determine these by applying the incremental method (comparing costs and revenues in the with-project scenario with costs and revenues in the without-project scenario).

For revenues, consider only cash in-flows directly paid by users *(such as charges borne directly by users of the infrastructure)*.

⚠ Cost savings that are not passed on to users through fare reductions or offset by an equal reduction in the operating subsidy can increase your project's potential to be financially profitable.

When calculating costs and revenues, only include cash flows. Do not use accounting items such as depreciations and reserves.

2.4 Frequently Asked Questions

When selecting key parameters for your socio-economic and financial analysis, you must check the FAQs published under the specific call and apply the recommendations provided — or state why you are not following these recommendations.

3. Using the simplified CBA calculator

If your project requires only a simplified cost-benefit analysis, download the simplified CBA calculator (Excel file) and enter information about your proposed project from your business plan.

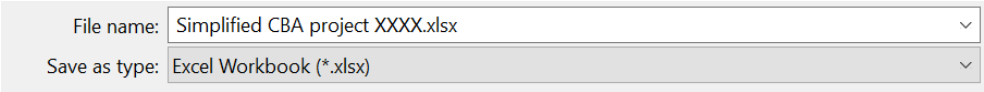
Macros in the calculator

The calculator contains several macros and is saved with the extension '.xlsm'.

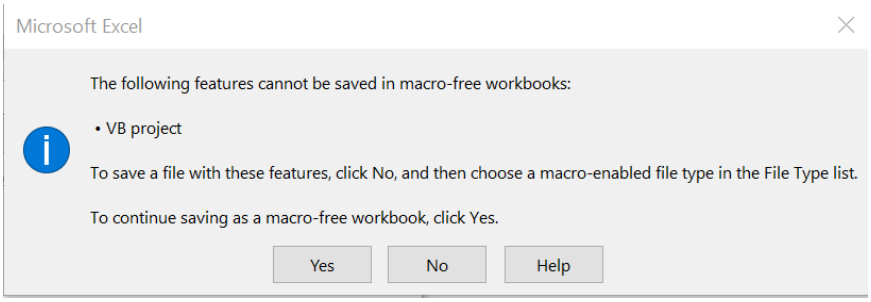
Some organisations automatically disable macros in '.xlsm' files. If this is the case for you, you might need to ask your IT administrators to temporarily revoke this restriction (or open the calculator on a personal device).

When you' finish filling in the simplified CBA calculator, save the file with a different extension (without macros):

Select *Save as* and change the file type from 'Excel Macro-Enabled Workbook (*.xlsm)' to 'Excel Workbook (*.xlsx)'.



Excel will issue the following message. Click 'Yes'.



Spreadsheet configuration

To configure the simplified CBA calculator correctly, choose the following 3 settings in the general assumption sheet ('***G.Asm***'):

Setting	Cell	Appearance
Select 'Transport sector'	F11	Sector *Transport*
Select 'Cost Benefit Analysis'	F13	Economic appraisal method *Cost-benefit analysis*
Activate 'Financial analysis'	F75	Do you want to calculate the financial performance indicators? Yes

⚠ If you don't use these settings, your application may be rejected.

Manual input of direct revenues

You will have to manually encode the direct revenues in each of the Option Sheets (O."x"), in rows 124 to 140.

If possible, follow the DG REGIO Guide to Cost-Benefit Analysis of Investment Projects to encode your estimate of the users willingness to pay (WTP) for project outputs (less changes in supply costs). If not possible *(i.e. absence of supporting information)*, you can copy into these rows the financial revenues in the form of user fees, charges or tariffs (as encoded in row 71 of the same tab).

⚠ Please be aware that no information on direct revenues will result in inaccurate calculation of key economic indicators *(e.g. ENPV, ERR)* and thus harm your proposal.

Automatic calculation of externalities

Externalities are calculated in a dedicated sheet called 'Transport'.

If the general assumption sheet ('G.Asm') is set to include several options, the *Transport* sheet will feature 2 tables for each option: one for **traffic data** (to estimate externalities) and one for **time** (to monetise time savings).

In each of these tables, you only need to select the 'transport mode', 'vehicle type' and unit (used to measure the expected change in traffic/travel time). The model then automatically calculates the correct values for each line of traffic.

All four main types of externality (accidents, air pollution, climate change and noise) are calculated automatically.

Option 1 Copy content to O.1

'Text'

Traffic volume data

Name	Mode	vehicle type	unit
	Road	[Road] bus	ptkm

Similarly, to have the file calculate the correct time value, select 'transport mode' and 'purpose'.

Travel time saving data

Name	Mode	Purpose

To transfer the estimated externalities to the relevant option sheet (e.g. for Option 1, to sheet 'O.1'), press the button next to the Option number.

This will copy the transport externalities and time savings for a given option.

Option 1

Copy content to O.1

'Text'

Traffic volume data

Name

Mode	vehicle type	unit
Road	[Road] bus	ptkm

Annex 1

Scope of the cost-benefit analysis for CEF-T projects

This annex will help you choose the proper scope for the economic and financial analyses, and accurately identify the relevant cash flows for them.

⚠ '**Cash flow**' refers to any flow expressed in monetary values which is included in the financial and economic analysis.

It is important to avoid a scope that is too wide (including irrelevant cash flows) or too narrow (excluding relevant cash flows).

Typical mistakes include:

- not including in the economic analysis costs that are relevant but not borne directly by your organisation
- not including in the financial analysis revenues generated by inter-related dependent components or services.

This can happen because there is no general rule applicable to all cases: defining the appropriate scope involves a certain degree of judgment, as projects have different objectives and different effects.

This annex provides **principles and parameters** that will help you identify the most appropriate scope for your cost-benefit analysis.

Economic analysis

To develop a cost-benefit analysis, you must first define the scope of the economic analysis: for each of the categories of effects listed in section 2.2, you must identify the specific costs and benefits relevant for evaluating the project.

For example, you must create a precise list of project-specific impacts and affected individuals or groups, the transport modes subject to price or demand changes and the impact area *(i.e. the geographic extent of the effects on the transport network)*.

The following guiding principles will help you to define a scope that fits your project.

Step 1 — Necessary components

> ***Guiding principle 1 (Necessary components)***
>
> *The scope of the cost-benefit analysis must include all components (infrastructure and/or equipment) that are 'necessary' for the project to deliver the intended service to the expected users — regardless of whether they are already in place or still to be built.*
>
> *This may require some 'necessary' components to be added to the project itself. But if a project includes components that are not mutually interdependent, then they should be grouped into distinct sub-projects, and a separate cost-benefit analysis should be carried out for them.*

The DG REGIO Guide to Cost-Benefit Analysis of Investment Projects defines the minimum scope of the cost-benefit analysis based on the concept of the **self-sufficient unit of analysis**: A project to be evaluated constitutes a self-sufficient unit of analysis if it delivers a functionally complete investment (infrastructure/equipment) that enables a requested service to be delivered to a clearly identified pool of users and generates the expected benefits without requiring other new or existing investment.

⚠ For simplicity, we will use the term '**global project**' to refer to the self-sufficient unit of analysis considered in the cost-benefit analysis.

Your project might not constitute an appropriate unit of analysis if:

- it excludes some components that are logically required to deliver the intended services ('**under-scaling**') or
- it includes multiple independent components delivering different services ('**over-scaling**').

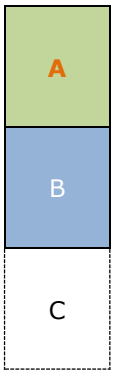
So it is sometimes necessary to expand the scope of the cost-benefit analysis beyond the project, or to split the assessment of the project into more than one cost-benefit analysis.

The extent to which the scope should be adjusted varies by case. Below are some guiding principles for deciding whether and how to adjust:

- If the components of the project are not self-sufficient, i.e. cannot function without other components, then **you must expand the scope** of the cost-benefit analysis to include all other necessary components – even if these are not eligible to be financed through EU funds or if you will only apply for CEF financing for them at a later stage
- If your project covers more than one self-sufficient unit of analysis, **you must split the assessment** into separate cost-benefit analyses. *Example:* A Motorways of the Sea project involving largely independent developments at ports in different countries.

For practical purposes, when a project-specific planning document (such as a feasibility study) features other components that are part of an overall global project, this is generally valid proof that all these components are necessary.

In applying the concept of 'self-sufficient unit of analysis', use the following **3 categories of necessary components**:



The **project** — i.e. the part of the infrastructure and equipment for which you are currently requesting CEF support and/or which are being prepared for implementation.

Any other **existing components** (infrastructure or equipment) needed to commercially operate the service (whether fee-paying or not) that the project will deliver to end users.

Any **planned but not yet existing components** (infrastructure or equipment) that are needed to commercially operate the services the project will deliver to end users.

⚠ Your cost-benefit analysis should consider only **incremental amounts** (i.e. changes compared to the reference or 'business as usual' scenario).

'Business as usual' means a situation when the planned components (categories A and C above) are not implemented.

So all costs and benefits generated by existing infrastructure or equipment that are 'necessary' but whose level does not change compared to the reference scenario will cancel out.

However, **if some components of the global project are already operational**, already occurred incremental costs (and benefits) related to existing necessary components (category B) must be included in the analysis.

The unit of analysis should include all 'necessary' components, even if some of them are **implemented by a third party**, rather than the applicant.

Necessary components — examples

Example 1

A proposed project for which CEF financial support is being requested plans to construct a last-mile rail connection to a container port terminal currently only served by a road link (from the port handover railway station to the container terminal). This is **lot 2** of a global project.

However, the *global project* involves several additional investments 'necessary' to move containers by rail, namely:

- purchasing new cranes and equipment to load and unload the containers to/from the rail wagons within the terminal (**lot 3**);
- adapting the loading gauge of an existing tunnel on the rail line connecting the port handover station to the national network, to allow maritime containers to pass (**lot 1**).

Which of the 3 categories described above do the necessary components fall into?

- Lot 2 is the project and so is in category A
- Lot 3 must be included in the cost-benefit analysis as it is in category C (planned but not yet existing equipment needed to commercially operate the rail access).
- Lot 1, the existing tunnel, together with the entire national rail line, must also be included in the analysis, as it is in category B (existing infrastructure needed to commercially operate the rail access). Indeed, the tunnel and the entire line appear in both the reference scenario and the 'with-project' scenario because they already exist.

However, the works to adapt the loading gauge fall only into the 'with-project' scenario, as they are designed to serve the rail access development. Ultimately, the cost for the initial construction of the tunnel and the national line and their maintenance will cancel out.

Therefore, incrementally, the difference between the 'with' and 'without-project' scenarios is the adaptation works. In practice, the whole infrastructure is considered, but only the pieces that change are captured in the incremental cash flow analysis.

Lot 1 – Tunnel adaptation	Lot 2 – Rail track	Lot 3 – New crane
Category B	Category A (project)	Category C

Example 2

Here the project is to modernise a specific subsection of a new EU-wide rail corridor that is under development. For purposes of strategically planning the corridor infrastructure, the whole corridor can be treated as a single unit of analysis. But the corridor as a whole should not be included in the cost/benefit analysis for the subsection for which CEF funding is being requested.

To properly analyse the chosen design and standards for the subsection, the scope should be limited to a smaller self-sufficient unit of analysis, including the component that comprises the proposed investment on the subsection (Category A, as defined above), together with any additional project component falling under categories B or C above.

These additional components may include other works on the same section or works on contiguous sections that are needed to generate benefits to the expected users of the rail section covered by the project. Modernisation work on other, distant sections (mainly serving different needs) is not a "necessary" component, so the investment cost for this should not be included in the cost-benefit analysis.

Example 3

In a Motorways of the Sea project there are separate investments to upgrade RoRo terminals in 2 ports and a third investment to modernise the RoRo vessels operating a regular short-sea-shipping (SSS) service between the two ports.

Although all investments are part of the same project, they are largely independent developments, as the RoRo terminals are not exclusively dedicated to the SSS link between them, but rather serve multiple markets and routes.

Also, during their operational lifecycle vessels may be used on different routes and not exclusively on the one included in the project.

In this case, 3 separate cost-benefit analyses should be submitted as part of the CEF application, so the economic merit of each individual investment, as well as their financial performance and sustainability, can be independently evaluated.

Step 2 —Inter-related components

Guiding principle 2 (Inter-related components)

Inter-related but relatively self-standing components, whose costs and benefits are largely independent, should be appraised separately.

However, inter-related components whose (incremental) costs and benefits are essentially dependent on (or inter-dependent with) the main intended service of the global project must be included in the scope of the analysis.

Inter-related components are those that deliver ancillary/complementary services, in addition to the main service provided by the global project.

Inter-related components are never 'necessary', as they concern services that are complementary but not strictly needed to deliver the main intended service.

These ancillary services may indeed be provided in markets other than transport *(such as energy, urban regeneration or even accommodation or food)*.

The DG REGIO Guide to Cost-Benefit Analysis of Investment Projects stipulates: '*inter-related but relatively self-standing components, whose costs and benefits are largely independent, should be appraised independently'*. This is to ensure that the merits of smaller independent components are adequately assessed, i.e. in terms of demand levels and consideration of feasible alternatives, through dedicated cost-benefit analyses with a smaller scope.

⚠ If the (incremental) costs and benefits of the inter-related components are **essentially dependent** on (or inter-dependent with) the main intended service of the global project, these components are NOT independent and you must include them in the scope of your analysis.

The maturity (readiness) of such dependent inter-related components is also a factor determining whether they should be included in the scope of the analysis.

Inter-related components — examples

Example 1

A port authority is applying to the CEF for an investment to improve maritime accessibility for its main port. The investment is limited to dredging works required to allow larger vessels to call at the port.

No expansion or upgrading of the port terminals or quays is planned, as these already have the required capacity to sustain the increase in traffic caused by the project. The port is currently connected to its hinterland by road only, and the road network has enough spare capacity to accommodate all the expected incremental traffic to and from the hinterland.

Independently from the main investment in maritime accessibility, the port authority is also developing a new last-mile rail connection to the port. This connection is intended to contribute to the national strategic objectives of shifting transport to less polluting modes, and has already been decided and financed, although is not yet under construction.

So the question is whether and how the cost-benefit analysis for the maritime accessibility improvement should also include the investment costs of the new rail access project.

In this simple example, both projects indeed constitute 2 interrelated but relatively self-standing components, as their costs and benefits are largely independent:

- The main intended benefit of the rail access is reducing emissions by shifting hinterland transport of goods from road to rail, and this benefit can also be achieved independently of improvements to maritime accessibility; indeed, in our example, this project has been already evaluated and approved at the time the investment on maritime accessibility needs to be submitted to the CEF.
- The main intended benefit of the maritime accessibility project is improving the efficiency of the logistics chain, to reduce maritime transport costs. Because in this example, the port terminal can handle all the incremental flows of goods via road, this main benefit can be attained independently of the construction of the new rail access.

On this basis, the recommended approach is that **the dredging works should be appraised independently of the rail access project**.

The investment costs for constructing the new rail access should not be considered in the cost-benefit analysis. The analysis is only needed to evaluate the economic performance of the investment on maritime accessibility and take a decision on this investment. The decision on the rail access is independent.(In fact, the presence of the (already decided) rail access is be taken into account for the CBA of the maritime accessibility project when looking at the effects of the project on the transport network (transport costs and emissions in the hinterland leg of the transport chain). But since the rail access will be included both in the reference and "with-the-project" scenarios, the investment costs cancel out. The issue of network effects is discussed in the next section of this document.)

Example 2

Consider a CEF application for funds to extend a metro line to a city airport. Within the same initiative, the city also plans specific complementary investments to renew the public areas and streets immediately surrounding the stations.

This urban renewal component doesn't include any real estate (housing or commercial) development and is related to non-transport objectives, such as improving the visual quality of the urban landscape and developing green areas for the public.

The project's transport and urban regeneration components are relatively self-standing and independent in terms of objectives and expected benefits, but are strongly interdependent in terms of implementation and investment, as the urban renewal initiative is designed to be a complementary initiative of the new metro line, and physically related to the same station sites.

In this case, although the project covered by the CEF application is limited to the transport sector, the scope of the cost-benefit analysis should be extended to include both project components (transport and urban renewal).

Example 3

Consider a project to develop an onshore power facility in a port (cold ironing). Together with this initiative, the port authority is also planning a complementary investment to produce the electricity needed to supply the ships from renewable, carbon-neutral sources.

The two components (power supply to ships and power production) are independent in terms of implementation and costs (as the onshore power facility is also connected to the national grid). Nevertheless, the benefits of both projects are interdependent, as the new clean power source will maximise the benefits of the cold ironing facility (reduced air and greenhouse gas emissions).

Unless concerns exist about the maturity of the development of the new power plant, the scope of the cost-benefit analysis submitted to the CEF can be reasonably extended to include both components (power supply to ships and power production).

A variant of this example is an integrated initiative to electrify an urban bus fleet, coupled with the construction of a new solar power plant to recharge buses and the deployment of new technologies for sustainable energy management.

Step 3 — Effects on the transport network

> ***Guiding principle 3 (Effects on transport)***
>
> *All non-negligible transport effects should be included in the cost-benefit analysis: both (i) direct effects on transport infrastructure that can be considered an alternative or which support the global project and (ii) network effects on sections that are relatively far away from the place of implementation.*

When defining the scope of the cost-benefit analysis, the intention is to correctly capture any changes in the costs and benefits linked to implementing the global project in a given impact area.

Whereas the previous principles deal with defining the global project, in this last step, the focus shifts to the effects that global project operations can have on the wider environment around the project, in particular the wider transport network.

Indeed, transport developments tend to have effects that exceed the (overall) project itself and affect other sections of the network infrastructure. These repercussions can be split into:

- **direct transport effects** — effects on transport infrastructure that can be considered an alternative or supporting route/mode
- **network effects** — effects on the wider network at different levels *(regional, national, international)*. This should be interpreted in a broader sense, i.e. including all transport modes and not only the transport mode(s) affected by the project.

Very large projects (especially for freight) can have a radical effect on the network they are part of and may therefore require extended analysis of the traffic at European level.

In any case, to ensure that the effort required to develop the cost-benefit analysis is proportionate to the size of the global project, the scope of the analysis for network effects must be geographically limited to the subnetwork where the global project impacts are not negligible and may therefore materially affect the outcome of the cost-benefit analysis.

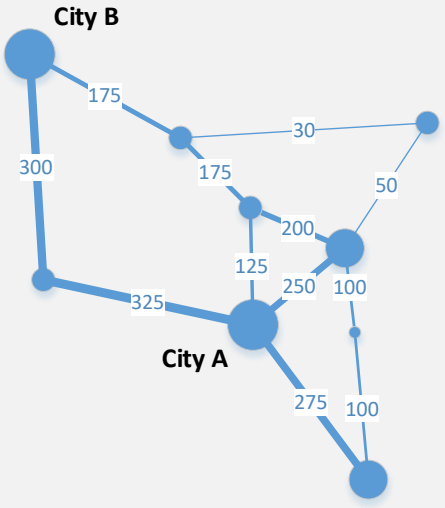
Effects on transport — examples

Example 1 Direct effects on a monomodal network

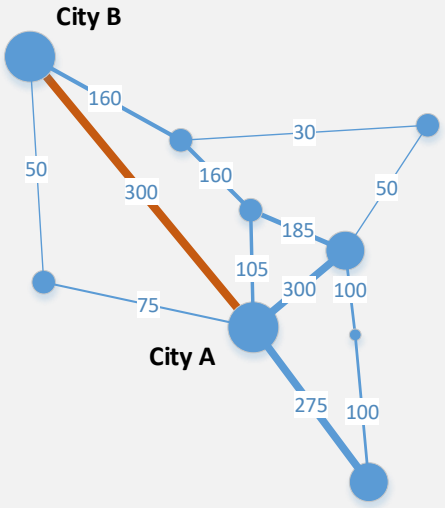
To illustrate these considerations, let's use a new example: the construction of a new high-speed railway connection between the 2 main cities in a country: city A, the country's capital, and city B, the country's main port. These cities are already linked by a railway, but the new line will be direct and a faster connection.

The following graphic shows the impact of building the new line (the red line) on surrounding railway connections ('direct transport effect').

Traffic on the rail network **without** the project

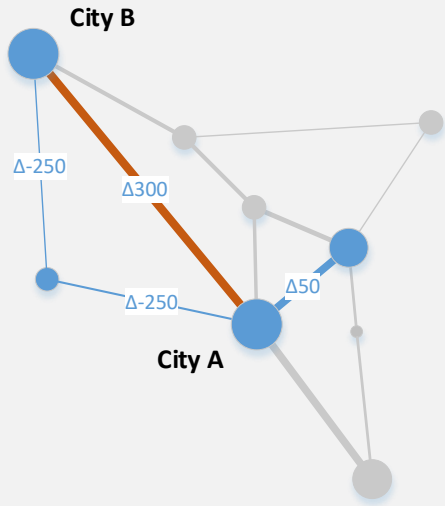


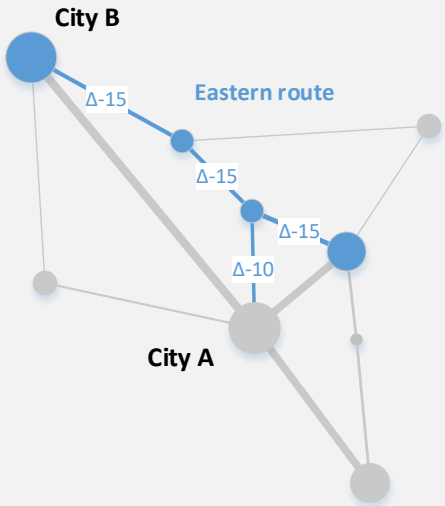
Traffic on the rail network **with** the project



The effect of the global project is represented by the change of traffic between the original network (left-hand graphic) and after the global project is implemented (i.e. the new line is built – right-hand graphic).

The effect on all surrounding connections should be added to the analysis. Both the 'western route' (which sees a major drop in usage: -250,000 passengers, -83%) and the 'eastern route' (only marginally affected by the global project: -50,000 passengers, -29%).



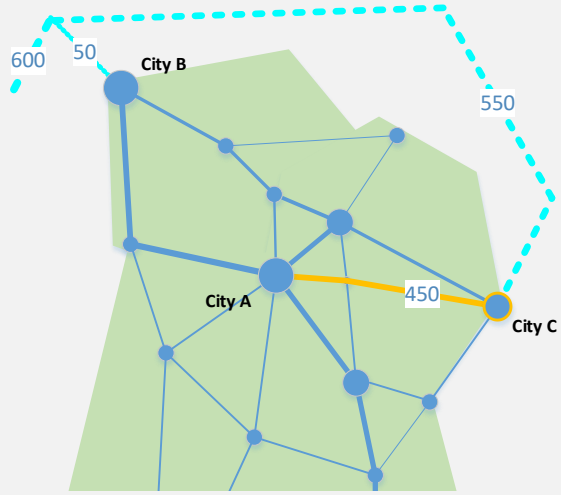


Example 2 Multimodal network effects

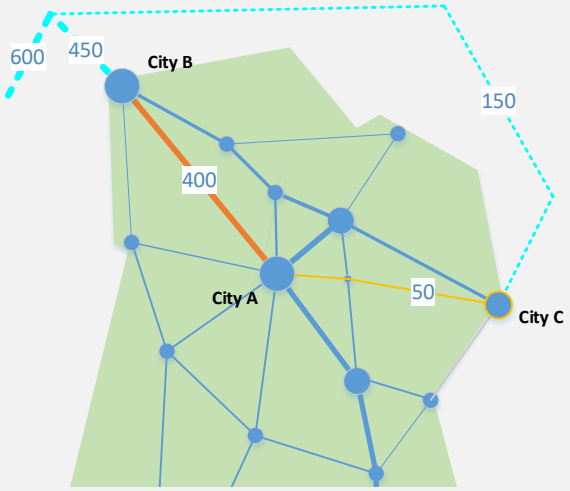
Let's now expand the previous example to study the network effects: the new high-speed, high-capacity line will make access to the inland capital city easier for freight vessels unloading at city B (the northern port), instead of shipping to the eastern port as happens in the without-project situation.

In this example, the northern port has sufficient spare capacity to handle the new traffic, so no investment is needed in this node.

Traffic on the multimodal network **without** the project

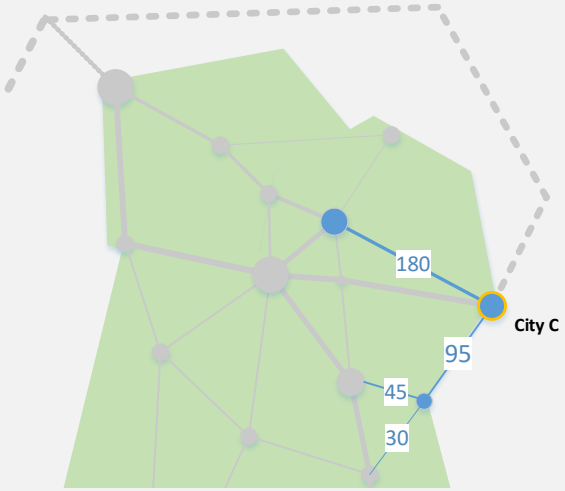


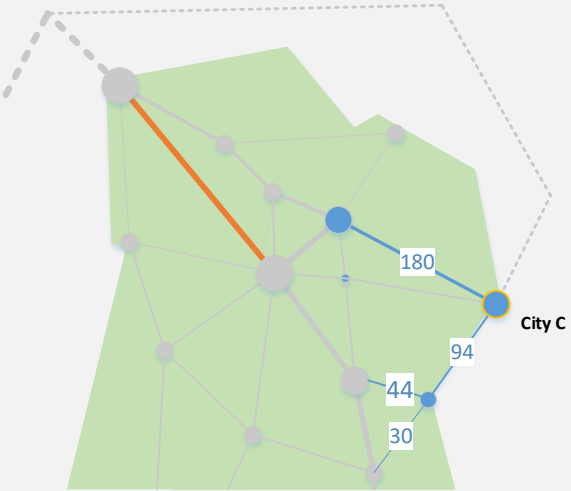
Traffic on the multimodal network **with** the project



The cost-benefit analysis must include network effects, i.e. changes in the routing of freight on sections of the network far away from the global project – not only railways (in orange) but also maritime routes (in light blue). Network effects go beyond the transport mode covered by the project – they also include changes in other transport modes.

If they concern a large project (as in this example) and are significant, the effects on the other rail sections linking the eastern port to the other cities or surrounding urban areas could also be included.





Time frame for the analysis

Your analysis must be based on information that is up to date on the day you submit your application, to give the most reliable view of the expected project costs and benefits.

However, for applications relating to a new phase of a project that is already under construction, and for which you have already received CEF support, you can **resubmit** the cost-benefit analysis you submitted for the previous phase — if both the following conditions are met:

i. the **new project was already included** in the scope of the original cost-benefit analysis. This would typically be the case if the ongoing project was a category C activity at the time the analysis was prepared. While less likely, another possibility is that the project was a dependent inter-related activity.

ii. **no significant changes** have occurred that may invalidate the original cost-benefit analysis. Significant changes can relate to the ongoing project itself if, for example, its nature, scale or scope (or its context/background). For example, if demand has changed. This could happen if a competing project has been implemented in the meantime or if there has been a structural economic change (technological breakthrough, normative constraint or changed social conditions/uses/customs).

However, the requirement for the cost-benefit analysis to be up to date doesn't necessarily mean that the analysis must be limited only to project components that have not been implemented at the time you submit your application *(i.e. new constructions/purchases or upgrades to existing infrastructure or equipment)*.

Indeed, the guiding principles described in the previous sections have precedence over pure time-based considerations: in particular, expenditure already incurred before the day you submit, *if related to necessary or dependent inter-related components*, must be included in the analysis.

Such historical expenditure should be capitalised (using an average inflation rate based on CPI) and included in the first year of the reference period.

Historical costs — examples

As an example of how to treat historical and planned cost, let's look again at the project to construct a last-mile rail connection to a container port terminal *(see section on 'Necessary' components)*.

As described in that section, the cost-benefit analysis must include lot 1 (Tunnel adaptation), lot 2 (Railtrack) and lot 3 (New crane). Let's assume, in all the cases described below, that these lots are always implemented in that order (lot 1, lot 2, then lot 3).

CEF financing application for lot 1

The cost-benefit analysis must include lots 2 and 3 because they are in category C (planned but not yet existing infrastructure/equipment necessary to deliver the planned services).

Application for lot 1

Lot 1 – Tunnel adaptation	**Lot 2 – Railtrack**	**Lot 3 – New crane**
Category A (project)	Category C	

CEF financing application for lot 2

The cost-benefit analysis must include lot 3 because it still falls under category C.

The components already completed under lot 1 will be included in the cost-benefit analysis , because they are now in category B (existing infrastructure needed to commercially operate the rail access). You can use the original cost benefit analysis prepared for lot 1 (updated, if needed,, but no change in the scope).

Application for lot 2 (Lot 1 already completed)

Lot 1 – Tunnel adaptation	Lot 2 – Railtrack	Lot 3 – New crane
Category B	Category A (project)	Category C

CEF financing application for lot 3

The initial 2 lots should be included in the cost-benefit analysis because they are both now in category B.

Application for lot 3 (Lots 1 and 2 already completed)

Lot 1 – Tunnel adaptation	Lot 2 – Rail track	Lot 3 – New crane
Category B		Category A (project)

Therefore, depending on when the cost-benefit analysis is carried out, the 3 investments mentioned above could fall under different categories of components.

However, the cumulative scope of the analysis should always be the same because only by considering all 3 components does the analysis cover a self-sufficient unit of analysis.

For the project components already implemented at the time of the application, costs must be based on actual disbursements. Already occurred investment costs (and benefits if some components of the global project are already operational) must be capitalised (using an average inflation rate based on CPI) and included in the first year of the reference period.

Financial analysis

Unlike the economic analysis, the financial analysis is limited to **cash inflows** (revenues) and **outflows** (costs). It does not consider non-cashflow items such as externalities or non-monetary impacts on users (such as the perceived value of personal travel time savings).

However, it does include any savings in **operational costs** borne by the applicant.

⚠ The financial analysis includes only cash flows for **components that are under your control**.

This means all components implemented:

- directly by you (beneficiaries or affiliated entities that participate in the project) or
- by subcontractors or
- by another party associated with implementing the project (in its broader sense).

This contrasts with the economic analysis, which must include all costs and benefits generated by the global project – whether or not you have control over them.

In cases where the operator and owner of the investment are different organisations (e.g. in a PPP or a concession, or rail infrastructure used by one or more rail operators), you should carry out a **consolidated analysis** to determine the overall profitability of the global project.

This consolidation will neutralise cash flows between owners and operators while still presenting all the in and outflows for this aggregated organisation. For more guidance on this, *see the DG REGIO Guide to Cost-Benefit Analysis of Investment Projects*.

The scope of the financial analysis must **not be limited to the global project** but needs to be extended to:

- any **ancillary activities** that contribute to the overall service offering by the planned activity
- any **other activities** (or other business lines) that benefit from or are adversely affected by the existence and operation of the planned investment.

⚠ This is specifically important for inter-related components which deliver to users of the main service an ancillary/complementary service which is not easily available elsewhere or from another provider ('captive markets'; *quite frequent in some of the transport sectors addressed by CEF, such as parking areas, refuelling and charging stations*).

In such circumstances, where the only choice for the potential consumers of the main project service is whether to purchase what is supplied by the ancillary project components or make no purchase at all, the ancillary services are considered dependent and must be included in the analysis.

However, when dependency between the main and ancillary service is less clear – because the ancillary market is not 'captive' – the incremental cash flows for the complementary services can be disregarded.

Dependency — examples

Let's consider a project for a parking area for trucks. This will be built next to an existing highway rest area, which already hosts some facilities providing complementary/ancillary services on top of parking, including a restaurant which is managed by the applicant for the parking area project.

As there are no other catering facilities easily reachable by foot from the new truck parking area, drivers are dependent on it for meals while parked. These catering services are a captive market.

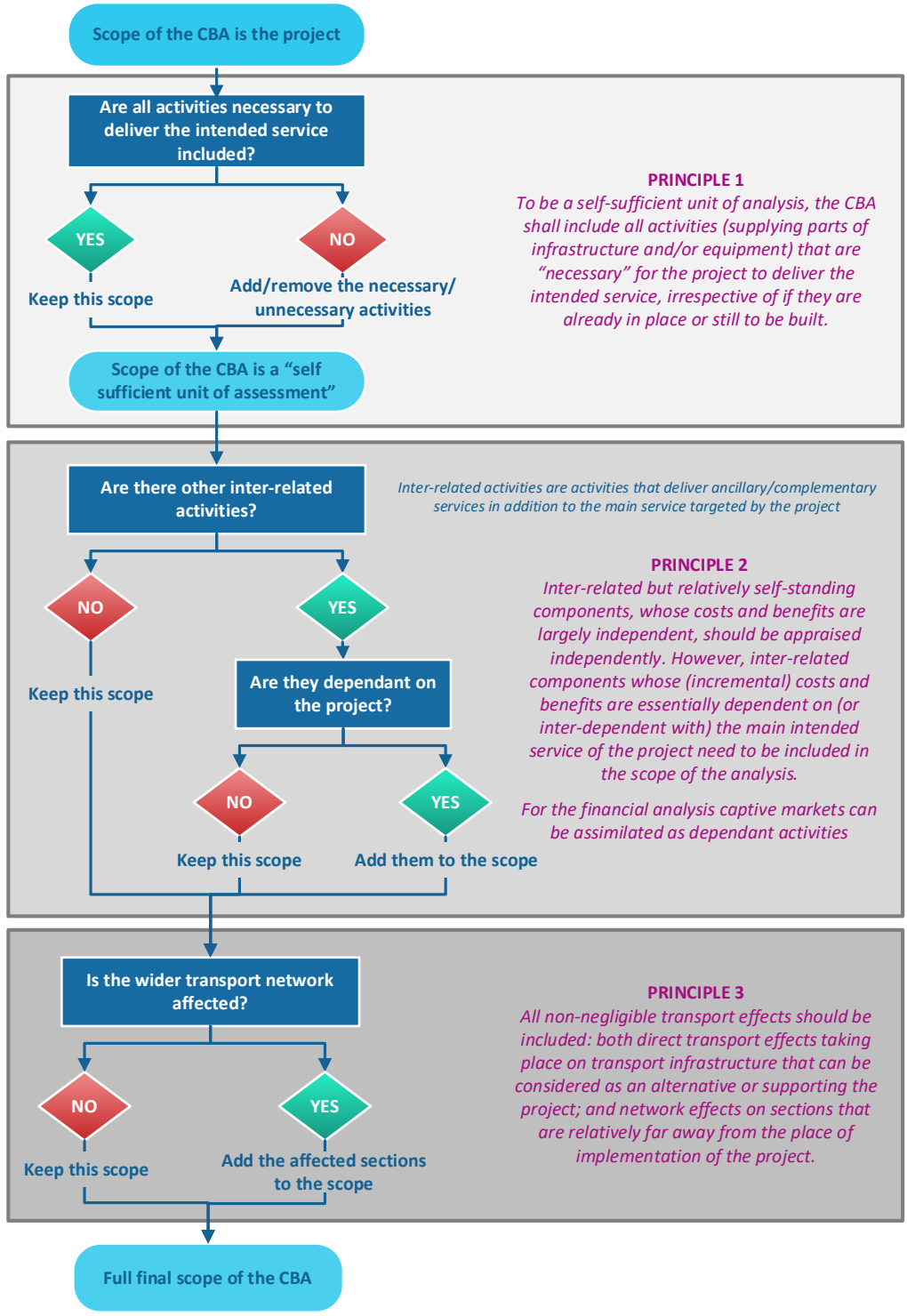
As the restaurant is under the control of one of the organisations involved in the project, its incremental cash flows should be included in the financial analysis.

Variant

The parking lot is in an area where several independent, easily reachable catering options are already available to customers.

In this case, dependency between the parking area and a particular restaurant/catering facility is less evident. The incremental cash flows of the catering services can be disregarded. This would apply even if one of them is owned by the company building the new parking area for trucks.

Decision tree



Annex 2

Source of the unit values for transport externalities and time

This section details the source of all unit values included in the simplified cost-benefit analysis calculator. The main source is the 2019 Handbook on the external costs of transport (HECT) (with annexes).

All HECT values were originally expressed in 2016 euros. These have been updated to 2021 euros using the Eurostat 'All-items' HICP deflator (PRC_HICP_AIND based on 2015=100, extracted on 11/03/2022).

The conversion factor is essentially the ratio between the 2021 HICP deflator and the 2016 HICP. To obtain a unit value in 2021 euros, we multiply the 2016 euro values by the conversion factor for the country in question, as in the table below.

	2016	2021	Conversion factor (2021/2016)
EU-27	100.18	108.82	1.0862
Austria	100.97	111.46	1.1039
Belgium	101.77	111.71	1.0977
Bulgaria	98.68	109.30	1.1076
Croatia	99.37	105.82	1.0649
Cyprus	98.78	101.92	1.0318
Czech Republic	100.70	115.10	1.1430
Denmark	100.00	104.90	1.0490
Estonia	100.80	114.72	1.1381
Finland	100.39	106.12	1.0571
France	100.31	107.68	1.0735
Germany	100.40	109.20	1.0876
Greece	100.02	101.75	1.0173
Hungary	100.45	119.04	1.1851
Ireland	99.80	103.60	1.0381
Italy	99.90	105.00	1.0511
Latvia	100.10	112.14	1.1203
Lithuania	100.68	115.75	1.1497
Luxembourg	100.04	109.61	1.0957
Malta	100.90	107.12	1.0616
Netherlands	100.11	109.98	1.0986
Poland	99.80	108.60	1.1453
Portugal	100.64	103.58	1.0389
Romania	98.93	110.67	1.1646
Slovakia	99.52	108.47	1.1207
Slovenia	99.85	104.82	1.0713
Spain	99.66	103.91	1.0741

Sweden	101.14	107.63	1.0924

In the HECT, the monetisation of climate change externalities is based on a cost factor of EUR 100 per tonne of CO_2 equivalent (central value for 2020-30).

However, because the shadow cost of carbon has increased, these values have been updated, as presented in the table below.

⚠ **The values below are expressed in 2016 euros. Update them to 2021 euros using the conversion factors above:**

Year	€/tCO₂e	Year	€/tCO₂e	Year	€/tCO₂e	Year	€/tCO₂e
2020	80	2030	250	2040	525	2050	800
2021	97	2031	278	2041	552		
2022	114	2032	306	2042	579		
2023	131	2033	334	2043	606		
2024	148	2034	362	2044	633		
2025	165	2035	390	2045	660		
2026	182	2036	417	2046	688		
2027	199	2037	444	2047	716		
2028	216	2038	471	2048	744		
2029	233	2039	498	2049	772		

Because the unit values for the simplified cost-benefit analysis are not specific to a given year, a way to aggregate the series above is needed.

However, to make an average of the above values, we need to define the length of the series (i.e. time reference for the project). As this is different for all projects, an approximation has been proposed – for the purpose of the simplified cost-benefit analysis calculator (only) a value of **300 €/tCO2e** is used.

Reading the tables below:

- ***** denotes conversion factors that have been updated to 2021 euros
- **n.a.** denotes missing unit values (*to be supplied in future versions of the Simplified CBA calculator*).

Road

Accidents

Average costs (EUR cent per passenger km or tonne-km)	
Average costs (EUR cent per vehicle-km)	
Passenger car - petrol	= 'Pass car – total'
Passenger car - diesel	= 'Pass car – total'
Passenger car - total	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Acc_output/Cells P5-P33 & AC5-AC33)* *
Bus	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Acc_output/Cells Q5-Q33 & AD5-AD33)* *

Bus - electric	= 'Bus'
Coach	= 'Bus'
Motorcycle (MC)	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Acc_output/Cells R5-R33 & AE5-AE33)* *
Light commercial vehicle (LCV) – petrol	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Acc_output/Cells S5-S33 & AF5-AF33)* *
Light commercial vehicle (LCV) - diesel	= 'LCV-petrol'
HGV - total	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Acc_output/Cells T5-T33 & AG5-AG33)* *
Passenger transport	Weighted average *('Pass car – total'; 'Bus2'; 'Coach'; 'MC')*
Goods transport	Weighted average *('LCV-petrol'; 'LCV-diesel'; 'HGV – total')*

** HECT data updated from 2016 euros to 2021 euros, using the conversion factors in the table above*

Air pollution

Average costs (EUR cent per passenger km or tonne-km)	
Average costs (EUR cent per vehicle-km)	
Passenger car - petrol	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cells P5-P33 & AC5-AC33)* *
Passenger car - diesel	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cells Q5-Q33 & AD5-AD33)* *
Passenger car - electric	zero
Passenger car - total	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cells R5-R33 & AE5-AE33)* *
Bus	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cells S5-S33 & AF5-AF33)* *
Bus - electric	zero
Coach	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cells T5-T33 & AG5-AG33)* *
Motorcycle (MC)	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cells U5-U33 & AH5-AH33)* *
Light commercial vehicle (LCV) - petrol	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cells V5-V33 & AI5-AI33)* *
Light commercial vehicle (LCV) - diesel	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cells W5-W33 & AJ5-AJ33)* *
HGV - total	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cells X5-X33 & AK5-AK33)* *
Passenger transport	Weighted average *('Pass car – total'; 'Bus2'; 'Coach'; 'MC')*
Goods transport	Weighted average *('LCV-petrol'; 'LCV-diesel'; 'HGV – total')*

** HECT data updated from 2016 euros to 2021 euros, using the conversion factors in the table above*

Climate change

Average costs (EUR cent per passenger km or tonne-km)	
Average costs (EUR cent per vehicle-km)	
Passenger car - petrol	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/CC_output/Cells P5-P33 & AC5-AC33)** New CO_2 price
Passenger car - diesel	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cells Q5-Q33 & AD5-AD33)** New CO_2 price

Passenger car - electric	Energy factor MJ/vkm *(Review GHG emission factors for transport for the EIB - Table 54)* x CF from MJ to kWh x Electricity LV grid Emission Factors in gCO2/kWh *(EIB Project Carbon Footprint Methodologies - Table A1.3)* x NEW CO_2 price
Passenger car - total	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cells R5-R33 & AE5-AE33)** New CO_2 price
Bus	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cells S5-S33 & AF5-AF33)** New CO_2 price
Bus - electric	Energy factor MJ/vkm *(Review GHG emission factors for transport for the EIB - Table 11)* x CF from MJ to kWh x Electricity LV grid Emission Factors in gCO2/kWh *(EIB Project Carbon Footprint Methodologies - Table A1.3)* x NEW CO_2 price
Coach	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cells T5-T33 & AG5-AG33)** New CO_2 price
Motorcycle (MC)	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cells U5-U33 & AH5-AH33)** New CO_2 price
Light commercial vehicle (LCV) -petrol	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cells V5-V33 & AI5-AI33)** New CO_2 price
Light commercial vehicle (LCV) -diesel	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cells W5-W33 & AJ5-AJ33)** New CO_2 price
HGV - total	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cells X5-X33 & AK5-AK33)** New CO_2 price
Passenger transport	Weighted average *('Pass car – total'; 'Bus2'; 'Coach'; 'MC')*
Goods transport	Weighted average *('LCV-petrol'; 'LCV-diesel'; 'HGV – total')*

** HECT data updated from 2016 euros to 2021 euros, using the conversion factors in the table above*
New CO_2 price is 3 times the original value of HECT

Noise

Average costs (EUR cent per passenger km or tonne-km)	
Average costs (EUR cent per vehicle-km)	
Passenger car - petrol	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Noise_output/Cells R5-R33 & AE5-AE33)* *
Passenger car - diesel	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Noise_output/Cells S5-S33 & AF5-AF33)* *
Passenger car - electric	= "Pass car – petrol"
Passenger car - total	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Noise_output/Cells T5-T33 & AG5-AG33)* *
Bus	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Noise_output/Cells U5-U33 & AH5-AH33)* *
Bus - electric	n.a.
Coach	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Noise_output/Cells V5-V33 & AI5-AI33)* *
Motorcycle (MC)	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Noise_output /Cells W5-W33 & AJ5-AJ33)* *
Light commercial vehicle (LCV) -petrol	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Noise_output /Cells X5-X33 & AK5-AK33)* *
Light commercial vehicle (LCV) -diesel	= 'LCV-petrol'
HGV - total	Weighted average *('HGV 3.5 - 7.5 t'; 'HGV 7.5 - 16 t'; 'HGV 16 - 32 t'; 'HGV > 32 t')* – HECT data *(Noise_output /Cells Y :AB5-Y :AB33 & AL :AO5-AL :AO33)* *

Passenger transport	Weighted average *('Pass car – total'; 'Bus'; 'Coach'; 'MC')*
Goods transport	Weighted average *('LCV-petrol'; 'LCV-diesel'; 'HGV – total')*

** HECT data updated from 2016 euros to 2021 euros, using the conversion factors in the table above*

Rail

Accidents

Average costs (EUR cent per passenger km or tonne-km)	
Average costs (EUR cent per vehicle-km)	
High-speed pax train	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Acc_output/Cells P50-P78 & AC50-AC78)* *
Elec pax train total	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Acc_output/Cells Q50-Q78 & AC50-AC78)* *
Diesel pax train	= 'Elec pax train total'
Elec freight train	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Acc_output/Cells R50-R78 & AC50-AC78)* *
Diesel freight train	= 'Elec freight train'

** HECT data updated from 2016 euros to 2021 euros, using the conversion factors in the table above*

Air pollution

Average costs (EUR cent per passenger km or tonne-km)	
Average costs (EUR cent per vehicle-km)	
High-speed pax train	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cells P50-P78 & AC50-AC78)* *
Elec pax train total	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cells Q50-Q78 & AD50-AD78)* *
Diesel pax train	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cells R50-R78 & AE50-AE78)* *
Elec freight train	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cells S50-S78 & AF50-AF78)* *
Diesel freight train	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cells T50-T78 & AG50-AG78)* *

** HECT data updated from 2016 euros to 2021 euros, using the conversion factors in the table above*

Climate change

Average costs (EUR cent per passenger km or tonne-km)	
Average costs (EUR cent per vehicle-km)	
High-speed pax train	Energy factor MJ/vkm *(Review GHG emission factors for transport for the EIB - Table 20)* x CF from MJ to kWh x Electricity HV grid Emission Factors in gCO2/kWh *(EIB Project Carbon Footprint Methodologies - Table A1.3)* x NEW CO_2 price
Elec pax train total	Energy factor MJ/vkm *(Review GHG emission factors for transport for the EIB - Table 20)* x CF from MJ to kWh x Electricity MV grid Emission Factors in gCO2/kWh *(EIB Project Carbon Footprint Methodologies - Table A1.3)* x NEW CO_2 price
Diesel pax train	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/CC_output/Cells P50-P78 & AC50-AC78)** New CO_2 price
Elec freight train	Energy factor MJ/vkm *(Review GHG emission factors for transport for the EIB - Table 22)* x CF from MJ to kWh x Electricity MV grid Emission Factors in gCO2/kWh *(EIB Project Carbon Footprint Methodologies - Table A1.3)* x NEW CO_2 price
Diesel freight train	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/CC_output/Cells Q50-Q78 & AD50-AD78)** New CO_2 price

** HECT data updated from 2016 euros to 2021 euros, using the conversion factors in the table above*
New CO_2 price is 3 times the original value of HECT

Noise

Average costs (EUR cent per passenger km or tonne-km)	
Average costs (EUR cent per vehicle-km)	
High-speed pax train	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Noise_output/Cells R50-R78 & AE50-AE78)* *
Elec pax train total	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Noise_output/Cells S50-S78 & AF50-AF78)* *
Diesel pax train	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Noise_output/Cells T50-T78 & AG50-AG78)* *
Elec freight train	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Noise_output/Cells U50-U78 & AH50-AH78)* *
Diesel freight train	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Noise_output/Cells V50-V78 & AI50-AI78)* *

** HECT data updated from 2016 euros to 2021 euros, using the conversion factors in the table above*

Inland navigation

Accidents

Average costs (EUR cent per passenger km or tonne-km)	
Average costs (EUR cent per vehicle-km)	
Inland vessel	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Acc_output/Cells P95-P123 & AC95-AC123)* *

** HECT data updated from 2016 euros to 2021 euros, using the conversion factors in the table above*

Air pollution

Average costs (EUR cent per passenger km or tonne-km)	
Average costs (EUR cent per vehicle-km)	
Inland vessel	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cells P95-P123 & AC95-AC123)* *

** HECT data updated from 2016 euros to 2021 euros, using the conversion factors in the table above*

Climate change

Average costs (EUR cent per passenger km or tonne-km)	
Average costs (EUR cent per vehicle-km)	
Inland vessel	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/CC_output/Cells P95-P123 & AC95-AC123)** New CO_2 price

** HECT data updated from 2016 euros to 2021 euros, using the conversion factors in the table above*
New CO_2 price is 3 times the original value of HECT

Noise

Average costs (EUR cent per passenger km or tonne-km)	
Average costs (EUR cent per vehicle-km)	
Inland vessel	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Noise_output/Cells P95-P123 & AC95-AC123)* *

** HECT data updated from 2016 euros to 2021 euros, using the conversion factors in the table above*

Maritime

Accidents

Average costs (EUR cent per passenger km or tonne-km)	
Average costs (EUR cent per vehicle-km)	
Average	n.a.
Small container	n.a.
Large container	n.a.
Small bulk	n.a.
Large bulk	n.a.

Air pollution (EU27 only)

Average costs (EUR cent per passenger km or tonne-km)	
Average	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cell Q190)* *
Small container	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cell R190)* *
Large container	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cell S190)* *
Small bulk	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cell T190)* *
Large bulk	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cell U190)* *

** HECT data updated from 2016 euros to 2021 euros, using the conversion factors in the table above*

Average costs (EUR cent per vehicle-km)	
Average	Estimated based on average tkm per vessel using HECT raw data
Small container	Estimated based on average tkm per vessel using HECT raw data
Large container	Estimated based on average tkm per vessel using HECT raw data
Small bulk	Estimated based on average tkm per vessel using HECT raw data
Large bulk	Estimated based on average tkm per vessel using HECT raw data

Climate change (EU27 only)

Average costs (EUR cent per passenger km or tonne-km)	
Average	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/CC_output/Cell Q190)** New CO_2 price
Small container	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/CC_output/Cell R190)** New CO_2 price
Large container	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/CC_output/Cell S190)** New CO_2 price
Small bulk	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/CC_output/Cell T190)** New CO_2 price
Large bulk	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/CC_output/Cell U190)** New CO_2 price

** HECT data updated from 2016 euros to 2021 euros, using the conversion factors in the table above*
New CO_2 price is 3 times the original value of HECT

Average costs (EUR cent per vehicle-km)	
Average	Estimated based on average tkm per vessel using HECT raw data / New CO2 price

Small container	Estimated based on average tkm per vessel using HECT raw data / New CO2 price
Large container	Estimated based on average tkm per vessel using HECT raw data / New CO2 price
Small bulk	Estimated based on average tkm per vessel using HECT raw data / New CO2 price
Large bulk	Estimated based on average tkm per vessel using HECT raw data / New CO2 price

New CO_2 price is 3 times the original value of HECT

Noise

Average costs (EUR cent per passenger km or tonne-km)	
Average costs (EUR cent per vehicle-km)	
Average	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Noise_output/Cell Q190)* * - (zero)
Small container	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Noise_output/Cell R190)* * - (zero)
Large container	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Noise_output/Cell S190)* * - (zero)
Small bulk	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Noise_output/Cell T190)* * - (zero)
Large bulk	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Noise_output/Cell U190)* * - (zero)

Aviation

Accidents (EU27 only)

Average costs (EUR cent per passenger km or tonne-km)	
Short	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Acc_output/Cell P141)**
Medium	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Acc_output/Cell Q141)**
Long	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Acc_output/Cell R141)**
Average	Weighted average *('Short'; 'Medium'; 'Long')*

** HECT data updated from 2016 euros to 2021 euros, using the conversion factors in the table above*

Average costs (EUR cent per vehicle-km)	
Short	Estimated based on average passenger-km per flight using HECT raw data
Medium	Estimated based on average passenger-km per flight using HECT raw data
Long	Estimated based on average passenger-km per flight using HECT raw data
Average	Weighted average *('Short'; 'Medium'; 'Long')*

Air pollution (EU27 only)

Average costs (EUR cent per passenger km or tonne-km)	
Short	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cell P141)* *
Medium	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cell Q141)* *
Long	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/AP_output/Cell R141)* *
Average	Weighted average *('Short'; 'Medium'; 'Long')*

** HECT data updated from 2016 euros to 2021 euros, using the conversion factors in the table above*

Average costs (EUR cent per vehicle-km)	
Short	Estimated based on average passenger-km per flight using HECT raw data
Medium	Estimated based on average passenger-km per flight using HECT raw data
Long	Estimated based on average passenger-km per flight using HECT raw data
Average	Weighted average *('Short'; 'Medium'; 'Long')*

Climate change (EU27 only)

Average costs (EUR cent per passenger km or tonne-km)	
Short	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/CC_output/Cell P141)** New CO_2 price
Medium	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/CC_output/Cell Q141)** New CO_2 price
Long	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/CC_output/Cell R141)** New CO_2 price
Average	Weighted average *('Short'; 'Medium'; 'Long')*

** HECT data updated from 2016 euros to 2021 euros, using the conversion factors in the table above*
New CO_2 price is 3 times the original value of HECT

Average costs (EUR cent per vehicle-km)	
Short	Estimated based on average tkm per vessel using HECT raw data / New CO2 price
Medium	Estimated based on average tkm per vessel using HECT raw data / New CO2 price
Long	Estimated based on average tkm per vessel using HECT raw data / New CO2 price
Average	Weighted average *('Short'; 'Medium'; 'Long')*

New CO_2 price is 3 times the original value of HECT

Noise

Average costs (EUR cent per passenger km or tonne-km)	
Short	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Noise_output/Cell R140)* *
Medium	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Noise_output/Cell S140)* *
Long	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Noise_output/Cell T140)* *
Average	Weighted average *('Short'; 'Medium'; 'Long')*

** HECT data updated from 2016 euros to 2021 euros, using the conversion factors in the table above*

Average costs (EUR cent per vehicle-km)	
Short	Estimated based on average passenger-km per flight using HECT raw data
Medium	Estimated based on average passenger-km per flight using HECT raw data
Long	Estimated based on average passenger-km per flight using HECT raw data
Average	Weighted average *('Short'; 'Medium'; 'Long')*

Time values

Passenger (EUR per hour)	
Road	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Cong_input/Cells E6-F32)* *
Rail	=‘Road’
Navigation	=‘Road’
Air	Estimated using the ‘Road’ to ‘Air’ proportion estimated in HEATCO

** HECT data updated from 2016 euros to 2021 euros, using the conversion factors in the table above*

Freight (EUR per hour)	
Road	HECT *(FINAL_Complete overview of country data_v1.1.xlsx/Cong_input/Cells G6-32)* *
Rail	Estimated using the ‘Road’ to ‘Rail’ proportion estimated in HEATCO
Navigation	=‘Rail’
Air	n.a.

** HECT data updated from 2016 euros to 2021 euros, using the conversion factors in the table above*

Annex 3

Checklist for your cost-benefit analysis

This checklist lists some of the key points that are assessed during the evaluation process and the main things you need to include in your cost-benefit analysis.

It is not exhaustive – rather it seeks to give some general guidance (you don't have to fill it in).

Have you….

1. Made sure your cost-benefit analysis has the **correct scope**, as described in annex 1?	**Y** ☐ **N** ☐
2. Made sure you have listed and detailed all the ways the project **deviates from the scope** of the cost-benefit analysis?	**Y** ☐ **N** ☐
3. Clearly distinguished cash flows related to the **factual** scenario from those related to the **counterfactual** scenario?	**Y** ☐ **N** ☐
4. Justified the **reference period** you used – if it is different from the recommended number of years?	**Y** ☐ **N** ☐
5. Justified the **discount rate** you used – if it is higher than the recommended ones (4% for the financial analysis and 3% for the economic analysis)?	**Y** ☐ **N** ☐
6. Made sure that the financial analysis uses a **consolidated** approach, as described in annex 1?	**Y** ☐ **N** ☐
7. Included detailed information about the **demand analysis**?	**Y** ☐ **N** ☐
8. Properly estimated the **residual value**, and justified it – if it is not the net present value of cash flows in the remaining life years of the operation?	**Y** ☐ **N** ☐
9. Defined **conversion factors** and **willingness to pay**, to transition the financial values in the economic analysis?	**Y** ☐ **N** ☐
10. Defined **externalities** to be included in the economic analysis, if relevant (taking into account the Handbook on the external costs of transport)?	**Y** ☐ **N** ☐
11. Used the required **Excel cash flow template** and uploaded it as an additional supporting document for your application?	**Y** ☐ **N** ☐
12. Viewed the **FAQs** and checked the parameters against them?	**Y** ☐ **N** ☐