



# Economic Viability

*This guideline expands on what is expected by the criteria statements in the Hydropower Sustainability Tools (HST) for the economic viability topic, relating to assessment, stakeholder engagement and outcomes. The good practice criteria are expressed for the preparation stage.*

*In the Hydropower Sustainability Assessment Protocol (HSAP), this topic is addressed in P-11.*

This guideline addresses the net economic viability of the project. The intent is that there is a net societal benefit from the project once all economic, social and environmental costs and benefits are factored in.

Hydropower projects can provide both economic benefits and costs in the regions where they are developed. These can be through either direct activities of the project (e.g. construction of dams, relocation of villages, provision of electricity) or actions indirectly related to the project (e.g. the creation of new industries).

The term 'economically viable' is used to describe a project that provides an overall positive net

economic contribution to society after all costs and benefits have been accounted for. This includes social, environmental and financial costs and benefits to society. Economic viability is distinct from financial viability, which typically focuses on the ability of a project to generate sufficient cash flow to deliver an appropriate risk-adjusted return on the capital invested.

Economic viability is informed by the financial analysis but takes a broader approach to costs and benefits than just financial considerations. Compared to a financial analysis, the economic analysis typically encompasses a larger geographic scale, examining the national or regional implications of the project and social and environmental externalities. Social and environmental externalities are factors that are not reflected well in market prices but can affect societal wellbeing; pollution is an example of a negative externality (e.g. it can impose public health and clean-up or remediation costs), and education is an example of a positive externality (e.g. educated people can go on to educate other people). These externalities are the social and environmental costs and benefits in an economic assessment.

## Assessment

*Assessment criterion - Preparation Stage: An assessment of economic viability has been undertaken with no significant gaps; the assessment has involved identification of costs and benefits of the project and either valuation in monetary terms or documentation in qualitative or quantitative dimensions.*

Economic viability assessments may be completed to confirm a rationale for public investment (including investment from public sector development banks), to fulfil regulatory requirements, or to demonstrate to project stakeholders that the project will provide an overall economic benefit to a region.

The main method for assessment of economic viability of a project is a **Cost-Benefit Analysis (CBA)**. Costs and benefits are expressed as far as possible in monetary terms so that they can be compared on an equal level. A project is assessed as economically viable if the project benefits exceed the project costs.

The main steps in an economic evaluation are:

- (i) identify the project benefits and costs;
- (ii) quantify and value the benefits and costs (where possible);
- (iii) adjust the costs and benefits to reflect their economic values (where necessary);
- (iv) establish benefit and cost streams over time and discount them at an appropriate rate; and
- (v) compare the present value of gross economic benefits with the present value of gross economic costs.

The economic analysis always starts with the project financial analysis, and then extends and modifies it. The analysis should include all costs and benefits that can be associated with the particular project. Costs and benefits should be quantified (where possible) and estimated for the entire life of the project. Valuation methods for each separate cost and benefit must be carefully considered and justification provided for the method adopted. It is important to justify the discount rate used to reach the conclusion.

All assumptions should be clearly stated in the analysis.

Considerations in relation to costs in the economic model include:

- all construction costs in the project financial model should be included as a starting point;
- costs should include residual (not fully avoided, mitigated or compensated), environmental and social impacts of the project;
- land acquisition costs may need to reflect the future income potential of a piece of land if that potential is not reflected in market prices and/or compensation rates;
- the analysis may need to differentiate between traded (imported) and non-traded goods (domestic resources);
- the analysis may need to differentiate between scarce (often skilled) labour and surplus (often unskilled) labour;
- the economic model should not include costs relating to taxes or financing costs;
- considerable care needs to be taken in terms of how best to factor in the effects of inflation and future changes in prices over time from a wider economic perspective; and
- sunk costs, and costs that would be incurred even if the project did not go ahead, should be documented, although they typically do not influence a decision to proceed with a project.

Benefits in the economic model should include:

- energy production benefits from the full energy production;
- additional energy production of downstream plants achieved because of the project;
- any induced (secondary) benefits from energy availability, in the case that the country is energy-constrained and there is no alternative generation option; and
- any net environmental and social benefits for society, such as net benefits for biodiversity through offsets and the net social benefit through improved livelihoods of the local population.

The magnitude of anticipated benefits should be analysed against appropriate baseline indicators, and the longevity of the benefits should be factored into the analysis.

Although monetary evaluation of the environmental and social costs and benefits of a project can be difficult, wherever possible the values should be estimated as this allows a comparison with financial assessments. If it is not possible to estimate a value for a particular benefit or cost, at least quantitative estimates can be provided for expected changes in the environment and for society and/or an ordinal ranking could be assigned on the basis of its materiality (i.e. societal importance or significance). Where costs and benefits are not quantified, justification should be provided along with an assessment of the materiality of the unquantified factors.

Sources of information for the analysis may include, for example: an analysis of the economic context or region; an analysis of the climate change benefits of the project; analysis, quantification and valuation of project costs and benefits; loan appraisal reports; and economic analyses of natural resources and riparian linked livelihoods. A consideration of alternatives to the project development can be important for determination of project costs and benefits, including doing nothing, alternative forms of power generation, and alternative uses of the site.

There are a number of analytical techniques that may be incorporated into the economic viability assessment. Examples include:

- **Incidence analysis** – This analysis disaggregates the overall impact of the project according to the impact on individual community groups (e.g. minority groups, regions, age segments). This can assist in identifying groups that are most impacted and in defining compensation and benefit sharing options.
- **Input-output analysis** – This is an economic model which uses a range of intersectoral relationships to estimate the regional flow-on (also called induced or secondary) effects of a project.

To meet good practice, some practical steps can be taken to keep the economic analysis feasible; for example, a partial analysis may be undertaken of the most important economic effects. Components of the analysis may be distributed over a range of documents rather than being consolidated in a single report. For some aspects, simply multiplying a quantitative change by a

certain value number from elsewhere may be sufficient (e.g. tonnes of CO<sub>2</sub> avoided x cost of climate change per ton as estimated by some authoritative sources).

If assessments are undertaken by parties with vested interests they may focus on the benefits of project and place less weight on negative impacts, which can create significant bias in the analysis. All economic analysis models are prone to data manipulation, which can include issues such as double-counting of benefits and poor quality of data. As such, findings should be scrutinised. The most defensible economic viability assessment will:

- use appropriate expertise;
- be objective;
- be comprehensive in fully considering costs and benefits;
- ensure quality and defensibility of the inputs, assumptions and methods; and
- take a balanced approach to considering costs and the broader implications of the development for the community and the environment.

## Stakeholder Engagement

*Stakeholder Engagement criterion - Preparation Stage: The results of the economic viability analysis are publicly disclosed.*

Public disclosure is demonstrated if members of the public can access information on the results of the economic viability analysis if they would like to do so. This requires some means by which the public knows that the analysis has been completed. Public disclosure may take place by enabling access to the actual document that presents the analysis or a summary of the analysis, either posted on a website, distributed, or made available on request to interested parties. If not consolidated into a single report, public disclosure could be demonstrated through public accessibility of the various sources that led to the conclusions on the results.

Good practice relates to disclosure of the results of the analysis and not the full details of the analysis. The public could be notified via a media

release or website about the main outcomes of the analysis. If only a one-off notification of the results has been made available, information may later be hard to access. In this case, some effort should be made by the developer to ensure awareness of and ease of accessibility of these results by stakeholders over time.

## Outcomes

*Outcomes criterion - Preparation Stage: From an economic perspective, a net benefit can be demonstrated.*

Demonstration of net benefits should be provided through quantitative indicators. Examples of quantitative indicators include net benefit, benefit-cost ratio, and economic rate of return. From an economic perspective, rate of return is an indicator for the developmental impact of a project proposal, allowing comparisons with other energy sector investment options. Unlike the financial rate of return, which is mainly of interest to organisations with commercial stakes in a proposal, the economic rate of return is of interest to society at large. Depending on the perspective of the evaluation, alternative indicators such as the net present value of the project, or the economic costs per unit of capacity installed or power generated, may be used.

The economic model should not be biased towards positive economic benefits (particularly financial benefits) or misrepresent the costs of negative material impacts. Sensitivity analyses would ideally be conducted to demonstrate the robustness of the conclusions. These analyses usually involve testing different values for key parameters to see by how much the underlying quantity or its value can change before the rate of return of the project becomes negative. Scenario analyses can also provide more rigour to the conclusions, e.g. by looking at several adverse circumstances that could potentially arise simultaneously and how they would affect the conclusions. If probability distributions for various parameters can be estimated, this can be done, for example, through Monte Carlo simulations. Cost and time overruns should be amongst the adverse circumstances considered.

It is common for economic viability reports to include a summary table that outlines all the costs and benefits associated with the project, their assigned values, and the subsequent calculation of the project's overall net economic impact. This summary should be high-level and presented in a simple, easy to understand manner. For the conclusion that a project has a net positive impact, benefits must exceed costs in the most probable scenario.