

NE0104: INTRODUCTION

Background and basic principles of economic valuation

The policy need for these guidelines

The purpose of this document is to provide practical guidelines for valuing environmental impacts via value transfer.

Assessment of the impacts of policies should be consistent and transparent. Cross-Whitehall guidance in *The Green Book* (HM Treasury, 2003) requires that all new policies, programmes and projects be subject to a comprehensive but proportionate appraisal to ensure that interventions enacted by public sector bodies are in the best interest of society overall. In order to provide a full account as possible of potential outcomes, a key component of appraisal is the comparison of the total benefits of a proposal to the full costs incurred by Government and society. Here *The Green Book* requires that all relevant costs and benefits be valued in monetary terms and the net benefit or cost of the proposal be calculated.

Costs and benefits related to market goods and services are estimated using market prices. For wider social and environmental costs and benefits for which no market price is available, monetary evidence from non-market valuation (or 'economic valuation') methods are used.

Continued development and application of economic valuation techniques gives rise to a substantial body of evidence on the value of environmental costs and benefits. Value transfer – which is also known as 'benefits transfer' – is a process by which readily available economic valuation evidence is applied in a new context. It is a quicker and lower cost approach to generating economic valuation evidence, compared to commissioning a specifically designed primary valuation study. This advantage of value transfer makes it a practical tool for analysis given the time and resources constraints decision-making regularly faces.

However, 'quick' and 'lower cost' do not mean that value transfer is easy and judgements are required as to when value transfer can be used and the level of effort that is appropriate in a given appraisal case. Overall, the more accurate the results need to be, the more effort is required. These guidelines emphasise transparency and appropriate use of sensitivity analysis to address concerns of accuracy. The role for value transfer is to make the best use of available economic value and other evidence recognising both time and resource constraints and the potential limitations of the analysis.

The primary audience for the guidelines are economists in Central Government and Executive Agencies who are tasked with estimating the value of environmental costs and benefits for the purposes of decision-making.

The guidelines are intended to establish 'best practice' for value transfer to assist analysts in:

- Deciding if value transfer is appropriate for a given appraisal;
- Selecting the most appropriate approach to value transfer and applying an appropriate level of effort;
- Selecting the most suitable economic value evidence from the literature;
- Implementing the steps of value transfer; and
- Presenting the results of value transfer to inform decision-making.

The guidelines apply equally to ex-ante and ex-post policy and project appraisal, and all other decision-making contexts for which economic valuation evidence is needed.

Basic principles of economic valuation

Analysts tasked with undertaking value transfer require a sound understanding of the concepts of economic analysis – as promoted by *The Green Book* - and should be familiar with the basic principles of economic valuation (see **Box 1**).

Economic valuation evidence is needed to allow environmental outcomes of a project or policy ('costs' or 'benefits') to be directly compared to other outcomes that are expressed in monetary terms. Typically the outcomes of interest are changes in the quality or quantity of the environmental good or service. The good or service may or may not be provided traded in a market (hence the terminology 'market' or 'non-market' good or service).

Box 1: Economic valuation

- Economic analysis – as outlined in *The Green Book* - is concerned with measuring the welfare of individuals and society in aggregate.
- Economic valuation does not measure the absolute value of environmental goods and services. It is concerned with the value of a change in the quality and/or quantity of the provision of these goods and services.
- The 'change' in the context of economic valuation is ordinarily a marginal change. The marginal value of a change is determined by the relative scarcity of the good or service, not only in terms of quantity, but also quality, location and timing of the change.
- The total economic value (TEV) comprises:

Use value relating to current or future uses of a good or service:

- Direct use values may be 'consumptive' (e.g. timber) or 'non-consumptive' (e.g. recreational activities).

- Indirect use values include key ecosystem services (e.g. climate regulation, flood protection, etc.).
- Option value is associated with retaining the option to use a resource in the future.

Non-use value derived from the knowledge that environmental resources continue to exist (existence value), or are available for others to use now (altruistic value) or in the future (bequest value).

- Economic value is measured by the amount of money individuals are willing to trade-off against changes in the provision of an environmental good or service:
 - The value of an improvement is estimated by either (i) individuals' willingness to pay (WTP) to secure it; or (ii) their willingness to accept compensation (WTA) to forego it.
 - The value of a degradation is estimated by either (i) WTP to avoid it; or WTA to tolerate it.
- Using money as the unit of measure for economic values enables a common comparison of outcomes – in particular of environmental and financial outcomes.
- Economic valuation methods estimate WTP or WTA using different types of data depending on whether the good or service is traded in actual markets or not:
 - Market prices where goods and services are traded in a market (for example timber);
 - Revealed preference data where the environmental good or service itself is not traded but its quality or quantity influence a marketed good (e.g. the influence of environmental amenity on house prices, the influence of the quality of a recreational experience on visitors' spending); and
 - Stated preference data where there are no actual or surrogate markets but the individuals are asked to trade off money against the change to be valued in a hypothetical market created through a questionnaire.

Basic principles of value transfer

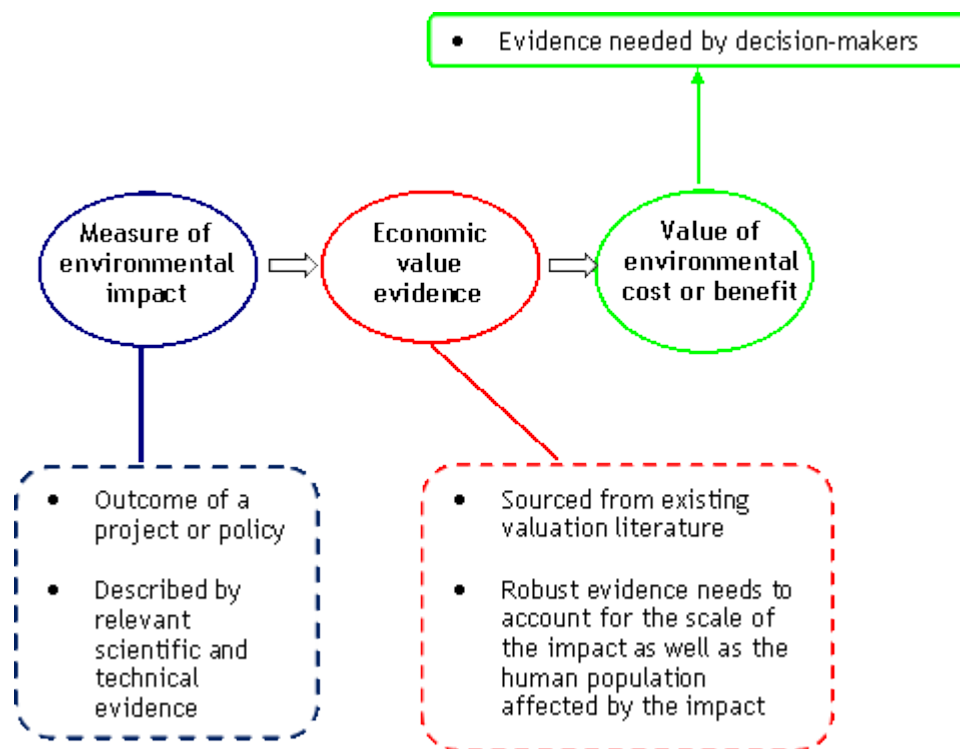
In order to estimate the economic value of a change in the provision of environmental goods and services, the analyst needs:

- *A reliable estimate of the economic value* – ordinarily in terms of 'willingness to pay';
- *A description of the change in the provision of the good under consideration* – this may be presented in qualitative and/or quantitative terms;
- *Knowledge of how the economic value (i) changes due to the change in provision of the good (ii)* – what is the relationship between the level of provision of the good and willingness to pay for marginal changes in the good?; and

- *Knowledge of which factors influence the economic value* - particularly in terms of the population affected by the change, their use of the environmental resource, their socio-economic characteristics (e.g. income, age, gender, education and so on) and substitute goods and services.

These Guidelines are designed so that analysts can gather the necessary information for (i) to (iv) above and do so in a transparent and consistent manner. This process requires not only economic analysis expertise, but also input from policy analysts and technical experts (both positive and social sciences). A simplified picture of the value transfer process and the types of information involved is shown in **Figure 1** below.

Figure 1: Information needs and output of value transfer



An example illustrates the process presented in Figure 1:

- Policy-makers may wish to assess the costs and benefits of proposed regulations for reducing effluent discharges from waste water treatment works.
- Investments by treatment works operators mean that water quality at beaches will improve from 'moderate' to 'good' status – this is based on scientific modelling of water quality.
- Existing valuation evidence reports that a visit to a beach with 'moderate' water quality is worth £x per person per visit, but £y per person per visit to a beach with 'good' water

quality (where y is greater than x). Thus, the unit economic value of the change in water quality from 'moderate' to 'good' status is $\pounds(y-x)$ per person per visit.

- The total value of this change is estimated by multiplying the value $\pounds(y-x)$ per person per visit by the number of visits to beaches, and summing this over the time period over which the change in water quality will be sustained. This particular example assumes that the improvement provides benefits to the existing visitors and does not attract new visits or visitors.

Inevitably this example over-simplifies a process that can involve detailed scientific and economic analysis and expert and stakeholder consultation. However it conveys the 'high level' story that needs to be understood by all involved in the appraisal of project and policy proposals.

Using the guidelines

These guidelines present a large amount of material intended to support the practical use of value transfer by economists and analysts. It is not recommended that that this is accessed and read in one visit.

Detailed information on the practical steps for value transfer and case studies can be referred to as and when required. Summaries of the main tasks for each steps are provided as an 'prompt' for experienced value transfer practitioners, along with the [Value Transfer Checklist](#).

As a guide:

- If you are a policy analyst, scientist or other technical (non-economist) expert the non-technical summary explains the basis and key principles for these guidelines, along with the collaboration required with economists to generate robust evidence for decision-making.
- If you are an economist tasked with undertaking value transfer:
 - Your starting point should be the [introduction](#) and the [summaries of the practical steps](#)
 - As a rule you should be familiar with the detailed material in Steps 1-3. Understanding the principles set out in these steps is essential to good value transfer practice.
 - Steps 4-7 and Annexes 2 and 3 focus on the actual value transfer analysis. Detailed material presented here is intended to assist in developing robust value transfer estimates for inputting to decision-making.
 - Step 8 is concerned with transparent and comprehensive reporting of results and key sensitivities in the analysis.

- Case studies are referred to as relevant throughout the guidelines where key principles are demonstrated by them.
- It is recommended that you also read the **technical report** which provides a comprehensive account of economic valuation and the state of the art of value transfer.
- If you are a practitioner undertaking a primary value study:
 - The [Protocol for Primary Valuation Studies](#) is intended to provide guidance for reporting of studies to enable easier and more effective value transfer applications in future.