Corporate Ecosystem Valuation (CEV) Guidance

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It is intended that this support document should be used at the earliest possible stage of the corporate decision making process set out on the NEAT tree. It is also designed so that it is relevant across all the stages and iterations:

Ideas ---- Survey ----- Assess ----- Plan ----- Act ----- Evaluate

What is Corporate Ecosystem Valuation?

Corporate Ecosystem Valuation (CEV) is a new decision-support tool which has been introduced by the World Business Council for Sustainable Development (WBCSD 2011).

In a CEV, the benefits and values of the ecosystem services a company (or product/process) depends and impacts upon are assessed to guide the company's decision-making. CEV serves corporate decision-making by identifying and valuing ecosystem impacts by businesses; but also risks and opportunities businesses face from changing ecosystem services. 'Ecosystem services' describe the benefits that the natural world provides to people and enterprises.

Because many ecosystem services don't have a market price, they are usually not integrated e.g. in management accounting. However, the crucial importance of incorporating business risks, dependencies and opportunities related to ecosystem services is for example highlighted by the Ecosystem Markets Task Force (EMTF 2012). CEV aims to identify and value such risks and opportunities. The tool can be applied to a business as a whole, but also products, services, projects, assets, or an incident.

There are clear indications that the tool will be increasingly important for corporate decision-making and reporting in the future (TEEB 2010; HM Government 2011; WBCSD 2011; Hanson et al. 2012; EMTF 2012). This applies for the UK; but also worldwide.

Purpose and Structure of this Guidance

The purpose of this guidance is to provide an easily accessible introduction to CEV as well as technical advice and relevant information for those who are undertaking a CEV in the UK. Therefore the guidance is divided in a practical and a technical part.

The practical part (page 1-4) is aimed for business representatives and provides a short introduction to CEV including a one-page summary. This should help you identify whether undertaking a CEV is helpful or necessary. It can also be used to champion the tool and the application of CEV internally. The technical part (page 5-8) is aimed for specialists undertaking a CEV. It offers relevant resources as well as best practice recommendations of how to apply a CEV in the UK.

Introduction to Corporate Ecosystem Valuation (CEV)

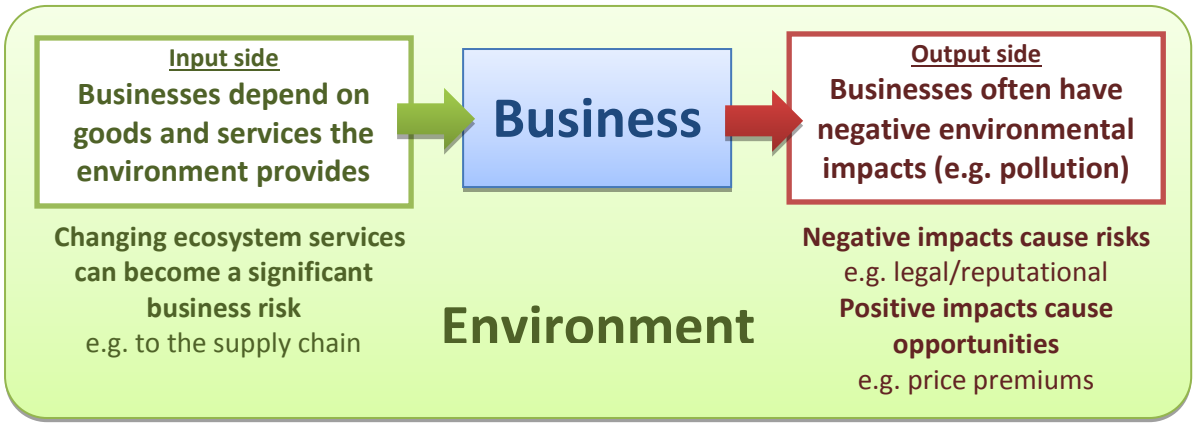

Figure 1: Interactions & interdependencies between businesses and the environment

Key questions along the decision-making process		Practice example
• Why should I be concerned about ecosystem services? • What are potential implications for my business?	Ideas	• One important product depends upon ecosystem services. • Changing ecosystem services can be a risk to my business success.
• Which Ecosystem services does my business depend on? • How does my business impact upon ecosystem services?	Survey	• My product depends upon clean water supply. • Intense agriculture in the river catchment worsens water quality.
• How are important ecosystem services changing in the future? • Which risks/opportunities do such changes imply?	Assess	• Without action water quality will further decline in the future. • This would increase the costs of my product by £…
• How can I realise win-win solutions (private & social)? • How can I benefit from designing environmental friendly products?	Plan	• I can pay farmers for changing agricultural management. • This is likely to be cheaper than engineering water treatment.
• How do I (re)design a product or services so that it benefits my business as well as the environment/society?	Act	• I'm negotiating with farmers and the Environment Agency. • My business and the EA share the costs for paying farmers.
• Has the (re)design of a product/ service the intended impact? • Could I reduce/manage my business risks as intended?	Evaluate	• The water quality has improved. • This 'green solution' saves my business £… annually (compared to the engineering solution).

Figure 2: Corporate ecosystem valuation along the decision-making process

The example stated above is not unrealistic. A commonly cited example where the management of ecosystem services is a cost-effective solution is New York City. Instead of constructing a new water filtration plant, the city authority decided to pay land owners in the Catskill Mountains to improve farm management techniques in order to prevent run-off of waste water and nutrients. This payment scheme ensured good water quality in the watercourses coming from the Catskill Mountains to New York and saved the water treatment company between US$ 4.5 billion and US$ 7 billion of capital costs plus additional annual treatment costs of between US$ 300 million and US$ 500 million (Perrot-Maître & Patsy 2001; Elliman & Berry 2007).

This is a good example for a win-win solution where the company as well as the environment/society benefits. The company benefits because of reduced treatment costs and the environment/society because of better water quality in the river catchment. This case study also shows how economic instruments like Payments for Ecosystem Services (PES) can provide cost-effective solutions by optimising the supply chain for multiple purposes rather than using engineering measurements at 'the end of the pipe'.

When and why should I use CEV?

Simplified, businesses interact with the natural environment in two ways:

- Input side: Basically all businesses depend on goods and services the natural environment provides. Changes to the provision of such ecosystem services have a direct impact on business success.

- Output side: Businesses have an impact on the natural environment (e.g. pollution or land-use changes due to development) which in turn affects human well-being. Such impacts can have an indirect effect on business success (e.g. financial, reputation).

Businesses always depend on the products and services the natural environment provides; at least to a certain extent. In the past, such ecosystem services and its sustainable provision over time were usually taken for granted. But drivers such as environmental pollution, climate change, population growth (including related land-use changes) are putting substantial pressure on our ecosystems and the goods and services they provide. In the UK, about one-third of ecosystem services are declining or in degraded state (UK NEA 2011).

If a company finds out that an important supplier is in trouble, it would usually try to find out how bad it is and what consequences this will have for the supply chain and the business success. If the supplier is the only possible supplier for a specific product or service at a reasonable price, it is even likely that the business would try to protect the supplier. The natural environment can be seen as such a supplier and the ecosystem services it provides are often impossible to substitute for and essential to business success. This is why businesses should conduct a CEV assessing their dependencies on ecosystem services including projected changes of such services. This can for example reveal operational risks; but also new business opportunities.

Businesses should not only be concerned about dependencies; but also their own impacts on the natural environment and ecosystem services. A poor environmental performance can cause

significant indirect risks such as reputational, regulatory and legal risks, market and product risks, and financial risks (Hanson et al. 2012). Customers, shareholders, investors and other relevant stakeholders are increasingly concerned about social and environmental impacts of products, services, and businesses as a whole.

Whilst negative impacts on the environment can cause substantial business risks; sustainable products and services often offer opportunities e.g. by reducing costs, by allowing a price premium or by tapping new markets.

CEV can be used to make the value of impacts and dependencies on the environment explicit which in turn allows a better management and communication of such interrelations. This follows the slogan "what gets measured gets managed". Therefore, businesses should at least conduct a screening process of a CEV, identifying and analysing the magnitude of interdependencies with the natural environment. This will help to judge if a 'full' CEV is necessary. These are some of the initial questions when considering a CEV:

1. What are likely to be the main ecosystem service dependencies, impacts, and other environmental externalities[1]?
2. What is the business case for doing a CEV?
3. What is the business "aspect" to be assessed?
4. What is the overall objective of the CEV?
5. What geographic and temporal boundaries should be used?
6. What standards or processes should the CEV conform to?
7. What relevant information is available?
8. Who are the key stakeholders and how should they be engaged?
9. What ecosystem valuation techniques are likely to be necessary?
10. What might the key study implementation constraints be?

(Adopted from WBCSD 2011, pp.35–36)

For more detailed information about CEV see for example the WBCSD guide to Corporate Ecosystem Valuation or the CEV tool review which has been produced as part of the NEAFO. The Ecosystems Markets Task Force Final Report also explores related opportunities for businesses in the UK.

However, it should be acknowledged that undertaking a CEV is a challenging task and demands specialised expertise. Such expertise, usually provided by ecological economists, is often not available in-house. Therefore, businesses intending to apply a CEV should seek advice from specialised consultants. The collaboration with universities might also be an option. Initial support for businesses thinking about applying CEV in the UK may also be provided by the Business Council for Sustainable Development UK (BCSD UK).

[1] An external effect or externality describes a 'spillover' which is incurred by a party that is not directly involved in the market transaction. A party might for example benefit from water quality improvements upstream without paying for such improvements. In such cases the market price does not reflect the full benefits (costs) of a transaction.

Technical Part of this Guidance:

This part of the guidance is aimed for specialists undertaking a CEV. It is structured along some of the ten questions as stated above. It should be read in line with the Guide to Corporate Ecosystem Valuation published by the WBCSD. This guidance doesn't replace the WBCSD guidance, but adds additional information and makes practical recommendations, especially when undertaking a CEV in the UK. Within this guidance, emphasis has been given to the practical application of the tool rather than the wider decision-making context which is outlined in the NEAFO NEAT Tree.

What ecosystem valuation techniques are likely to be necessary?

CEV is very flexible and allows a wide range of possible applications. One may, for example, evaluate and value the environmental impact or footprint of a (new) product or the value of ecosystem services provided by the corporation's land holdings. Both CEVs have very different objectives and methodologies. Because of its wide scope, a CEV is usually informed by other valuation tools or methods. It is also not always necessary to value impacts/dependencies on ecosystem services in monetary terms. Depending on scope and purpose of a CEV, a qualitative or semi-quantitative assessment might be as appropriate as a monetary one. This may especially be an option for small and medium enterprises (SMEs), acknowledging budget constraints.

Within this guidance the emphasis is on the valuation tools which have been identified within scope of the National Ecosystem Assessment Follow-On, rather than repeating the steps identified by the WBCSD guidance in detail.

For situations where the environmental/social impact of products, services, processes or projects needs to be evaluated, a combination of Cost-Benefit Analysis (CBA) and Multi Criteria Decision Analysis (MCDA) may be chosen as 'sub-tool' to inform a CEV. There are usually different options to design a product, each with different impacts and dependencies on ecosystem services. CBA and MCDA can be used to compare such design options and the effect on business performance (including potential cost-savings, price premiums, etc.) as well as wider social and environmental impacts along the supply chain. Within scope of the NEAFO, 'ecosystem-proofed' tool reviews for CBA and MCDA as well as a CBA/MCDA tool guidance have been produced.

If the aim of the CEV is to identify and value dependences of a business, product, service, or a process on ecosystem services or the state and value of land holdings, an Ecosystem Assessment for the own landholdings or the ecosystems that are most important to the business may be conducted. An Ecosystem Assessment also allows to predict future changes of the provision of ecosystem services. This can be very useful if a product/service depends on a specific ecosystem service under threat. The NEAFO Ecosystem Assessment tool review and Ecosystem Assessment guidance will provide further information and assistance.

If the CEV concerns the impacts of land-use changes caused by the business activities, the ecosystem services framework may be applied within scope of an Environmental Impact Assessment (EIA). A tool review and a tool guidance document are available on how to implement the ecosystem services framework within scope of an EIA.

This list of potentially applicable tools is not exhaustive. The literature reviews for valuation tools and ecosystem services tools may reveal other tools that can be applied for altering CEV purposes and objectives.

What standards or processes should the CEV conform to?

Regardless which specific valuation methodology is applicable, some aspects should always be acknowledged. Applying the ecosystem services framework is key when conducting a CEV, even if the relevance of different ecosystem services will alter, e.g. depending on the business sector and the purpose of the CEV. When carrying out a CEV in the UK, it is recommended to apply the ecosystem services framework of the National Ecosystem Assessment (UK NEA). It is also recommended to acknowledge the principles of the Ecosystem Approach when conducting CEV. These principles offer best practice advice for the assessment and management of ecosystem services.

For monetary valuation of future costs and benefits, it is common to apply a discount rate. Because environmental impacts often affect a long time horizon and future generations, the commonly applied discount rate applied for private Cost-Benefit Analysis to judge corporate investments (often the interest rate of a low-risk alternative investment) may not be the best choice when conducting a CEV. When valuing impacts of/on ecosystem services, we recommend to apply a social discount rate and a longer time horizon than for private investments.

HM Treasury recommends applying a discount rate of 3.5% for periods of up to 30 years. Afterwards the discount rate declines stepwise to 2.5% (HM Treasury 2003). However, this *standard discount rate* in the UK reduces benefits and costs fifty years into the future to less than two per cent of the undiscounted value. As will be becoming obvious, the results of CEV are very sensitive to the discount rate, which is concerning because it is the hardest input to justify objectively (Weitzman 2001). There we recommend developing values based on both the *standard discount rate* recommended by HM Treasury and a *sustainability discount rate* of zero. This should alert you to any significant sustainable development issues. A technical justification for the *sustainability discount rate* is contained in the technical appendix because our recommendation differs from central government guidance.

It might be useful implementing the sensitivity to the discount rate within the sensitivity analysis of a CEV. In that case the discount rate recommended by HM Treasury (3.5%-2.5%) might be applied for the lower threshold of the sensitivity analysis whilst the discount rate of zero might be applied for the upper threshold. As a compromise, a discount rate of 1.5% might be applied for the 'best guess' estimate of the sensitivity analysis (this rate is also recommended by the German Federal Environment Agency 2008). In any case it is very important to explicitly state which discount rates have been applied when undertaking a CEV.

We acknowledge that businesses often prefer clear and one-dimensional outcomes to inform corporate decisions. However, when communicating the findings of a CEV study, it is very important to always acknowledge caveats and limitations of the methodologies applied. It is also important that whenever findings of a CEV are communicated, internally or externally, it must be clearly stated

weather the calculated values are private or social to avoid misinterpretation. As a general rule for all CEV publications we recommend that methods, assumptions and caveats should always be transparent and well written up, matching scientific standards.

What relevant information is available?

Corporate Ecosystem Valuation is a comparatively new tool which limits the knowledge base and experience when applying the tool. This makes it difficult to provide best practice examples and 'lessons learned'. However, the WBCSD has collected case study summaries of CEV projects carried out around the world. The Ecosystems Markets Task Force Final Report also explores related opportunities for businesses in the UK. The following links provide further valuable information and advice when undertaking a CEV:

- TEEB for Business Coalition
- World Business Council for Sustainable Development: Ecosystems
- Business Council for Sustainable Development UK
- World Resource Institute: Corporate Ecosystem Services Review
- National Ecosystem Assessment (UK NEA)

Technical appendix: Justification for a *sustainable development discount* rate of zero

Discount rates and time horizons for their implementation are necessarily political. They relate to how much we care about the future and those who will inhabit it. Given that the trajectory of market evolution has generally almost wholly externalised the natural environment, and particularly its finite carrying capacity and the potential for 'tipping points' beyond which system stability and the production of ecosystem services might change radically and potentially irreversibly, it is necessary to pay particular attention to discount rates when undertaking a CEV.

There is provision within the Green Book for producing a sensitivity discount rate. That is to ask 'how would these results look different with a different discount rate?' The guidance calls for a sensitivity discount rate to be used in projects which 'involve very substantial and, for practical purposes, irreversible wealth transfers between generations' (Lowe 2008). This seems unduly restrictive, as a wide variety of projects, when the cumulative impact is considered, may have significant impacts on future generations. Therefore a sensitivity discount rate should be calculated for all projects to show the sensitivity of the conclusions to our assumptions about the future.

The official guidance recommends removing the pure time preference (impatience) element of the standard discount rate, which lowers it to 3 per cent (Lowe 2008). This approach however retains two assumptions which we might wish to question. It assumes that the long-term growth rate of the economy over 30 years will be 2 per cent per year. It also assumes that all forms of capital are substitutable with each other – that is to say that increased material consumption will compensate for reduced environmental quality or health. These assumptions seem insecure enough to test the sensitivity of our recommendations to them. Therefore a sensitivity analysis should be conducted

which uses a sensitivity discount rate of zero. For results calculated under this sensitivity discount rate it is the orders of magnitude of the values that are significant. Clearly, there may also be costs and benefits which are significant and unquantifiable, and these should be clearly reported.

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