



EU Environmental Technology Verification pre-programme

From Environmental Performance to Environmental Impact and Sustainability Assessment

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ETV: objective

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Promote *innovative environmental technologies* by providing technology developers, manufacturers and investors access to third-party validation of the performance

Environmental technology: technologies (product, processes and services) less environmentally harmful than relevant alternatives

Innovative: presenting a novelty in terms of design, raw materials involved, production process, use, recyclability or final disposal



Verification procedure: Objectives

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1. To help technology manufacturers, especially SMEs, to market their eco-technologies by providing independent and credible evidence about the performance of the technologies
2. To assist technology purchasers to select the best-performing eco-technologies, by providing a credible – widely recognized, scientifically valid – base for their purchasing decisions
3. To facilitate the implementation of public policies and regulations by providing a solid information on the level of performance achievable by new environmental technologies ready to break into the market



Verification procedure: Parameters

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ETV Objective 1

1. Performance claim(s) verification: assess the technical parameters related to the technology/process performance in terms of

- **area** (e.g. energy, waste, water...)
- **purpose** (e.g., emission reduction, reduction of energy use, increased depuration for water...)
- **operational parameters** (e.g. temperature, production capacity...)

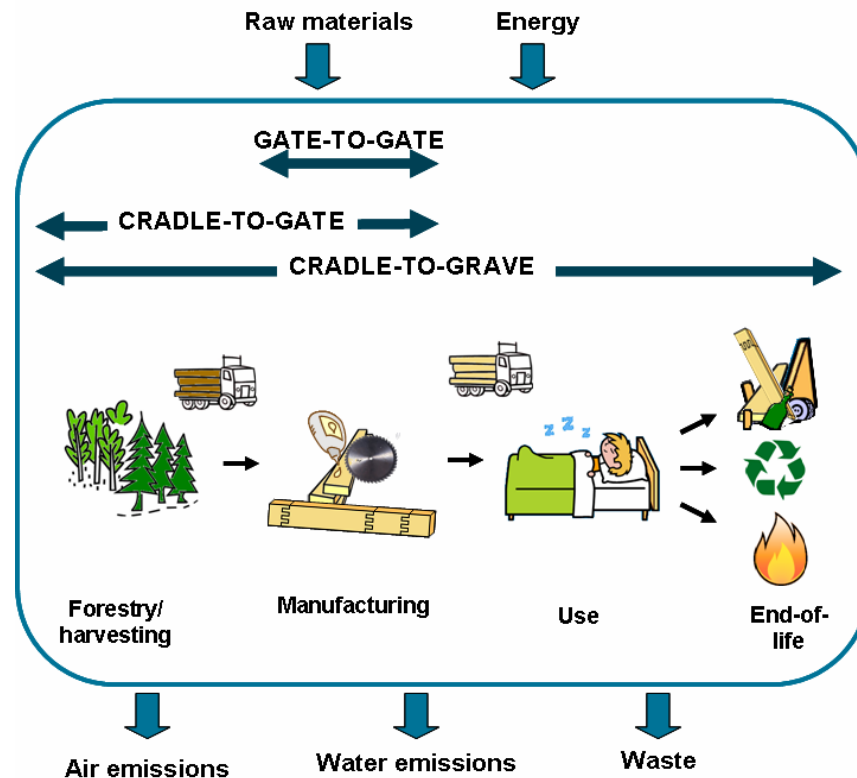
ETV Objectives 2,3

2. Providing solid information on environmental performance(s) in terms of

- **impacts on the environment along the whole life cycle** (e.g raw materials, production, use, recycling, end-of-life disposal)
- **environmental health and safety**
- **additional parameters** (e.g. costs)

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An LCA can help decision-makers select the product or process that results in the least impact to the environment





LCA common purposes and applications*

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Purpose	LCA applications
<i>Product improvement</i>	Detailed Ecodesign / Design for recycling
	Identification of Key Environmental Performance Indicators (KEPI) for Ecodesign/simplified LCA
	Development of life cycle based [...] environmental declaration (e.g. EPD)
	Green Public or Private Procurement (GPP)
<i>Communication</i>	Ecolabel criteria
	Development of the 'Carbon footprint', 'Primary energy consumption' or similar indicators for a specific product
	Calculation of indirect effects in Environmental Management System (EMS)
	Greening the supply chain
	<u>Providing quantitative life cycle data as annex to an Environmental Technology Verification (ETV) for comparative use</u>

* Extracted from: ILCD handbook, General guide for Life Cycle assessment – Provisions and action steps, 2010



Environmental Product Declaration (EPD)

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An EPD is defined as '*providing quantified environmental data using predetermined parameters and, where relevant, additional environmental information*' (ISO 14025)

EPD:

- **uses simplified data collection** through the best use of existing data (especially those gathered from the manufacturing plant and supplier industry) and other selected generic data from commonly available data sources
- **does not have to go through an extensive and complete LCA study**, but to **follow the requirement of specific guidance documents** (the Product Category Rules, **PCR**), where all the necessary background assumptions (including *cut-off* criteria) are made and justified
- **is an attributional LCA**: focuses on describing the environmentally relevant physical flows to and from a product or process

[consequential LCA: environmental consequences of a decision or a proposed change in a system under study]



Key Environmental Performance Indicators (KEPI)

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KEPI is a simplified LCA tool – limited ‘key’ dataset for input and one or only a few environmental indicators as output; prices are more accessible, also for SMEs, typically € 1000*.

How to use KEPIs:

Assess:

- **direct KEPIs:** from manufacturing operations (emissions to air or water, waste generated or recycled, resource use)
- **indirect KEPIs:** from supply chain (purchased electricity, purchased water...) or downstream impacts, if necessary (distribution, use, end-of life)

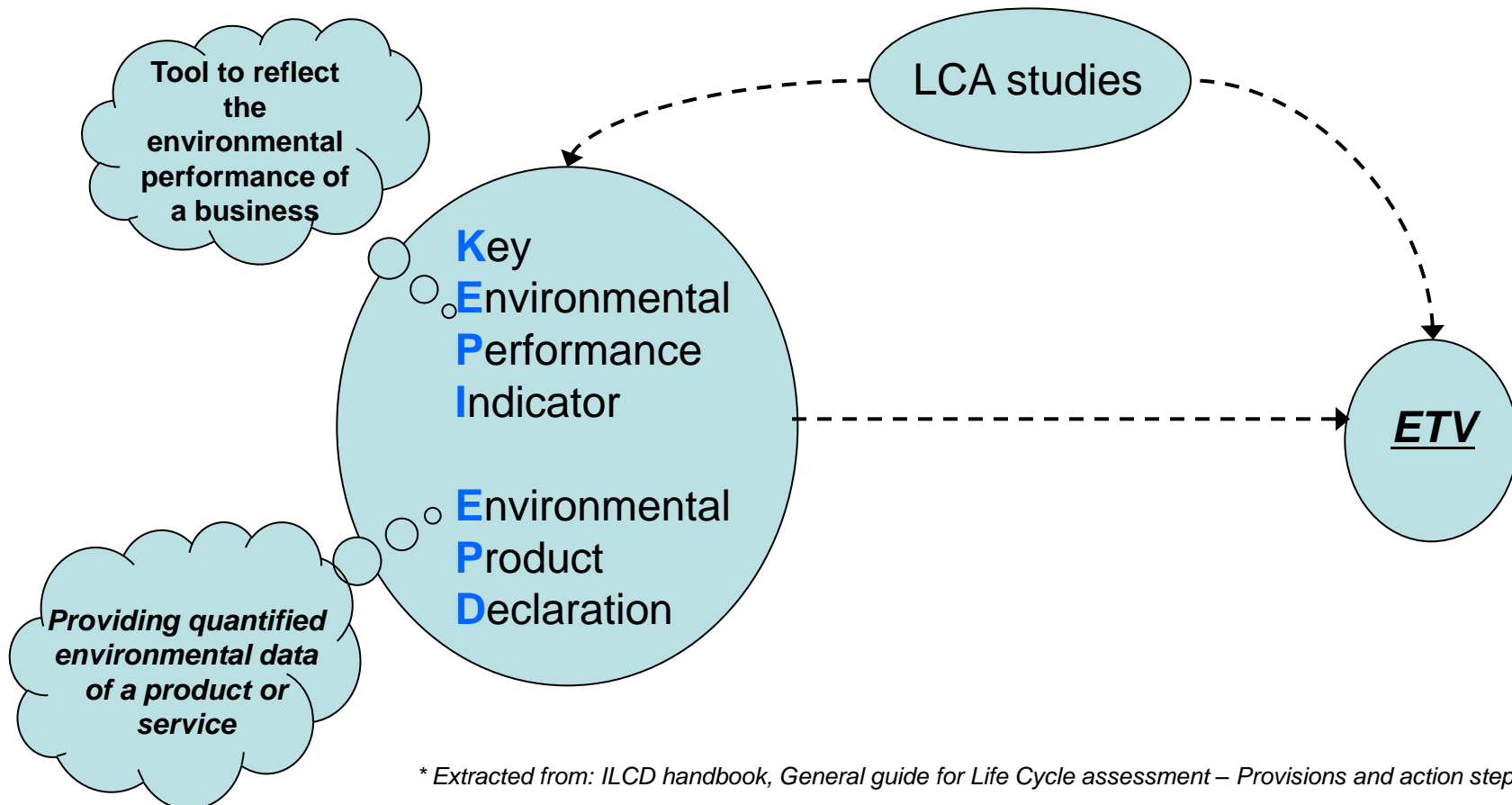
Measure KEPIs: direct KEPIs and most of indirect KEPI can be easily obtained from the producer

* Metodology study for Ecodesign of Energy-using products, Final report, 2005



Proposed LCA Applications as Inputs for ETV*:

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* Extracted from: ILCD handbook, General guide for Life Cycle assessment – Provisions and action steps, 2010



Indicators and ETV

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INDICATORS

- Key tools for easily quantifying information and enabling comparison between technologies
- Choice of indicators so as to help in the evaluation of the environmental performances of the technologies have to be done
- They should take into account:
 - A. Emissions/waste
 - B. Consumption
 - C. Other specific characteristics



Parameters to be considered within ETV*

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A Emissions / Waste	B Consumption	C Other characteristics
Air emissions	Water	Longevity
Water emissions	Electricity	Robustness
Waste generated	Raw materials	Reuseability, recyclability
	Use of hazardous materials	Resources used during equipment production
	Consumables	End of life decommissioning
		Man-power needed (operation, maintenance)

* Extracted from: EU Environmental Technology Verification pre-programme – Draft General Verification Protocol



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Verification parameters should take into account not only the technical performance but also the environmental impacts throughout a life cycle and sustainability assessment study.

but:

The problem of cost- and time-efficient verification impose the use of simplified tools for taking into account an LCA approach in a verification procedure; ETV procedure shall focus on technical parameters driving the impact, not to the environmental impact itself.

EPD and KEPI's tools are proposed as option for facing these aspects, carrying out a verification process that include not only claim verification, but including LCA considerations, by means of straightforward, time- and cost-efficient studies.



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Thank you for your attention



Life Cycle Impact Assessment (LCIA)

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Evaluation of potential human health and environmental impacts of the environmental resources and releases identified during the Life Cycle Inventory (LCI)

Methodology (mandatory steps): *bottom-up approach*

- *Selection and Definition of Impact Categories* (e.g. global warming, acidification, terrestrial toxicity);
- *Classification*: assignment of the inventory data to different impact categories (e.g. classifying carbon dioxide emissions to global warming);
- *Characterisation*: quantification of category indicator results for each impact category by using characterization factors.



Life Cycle Impact Assessment

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Evaluation of potential human health and environmental impacts of the environmental resources and releases identified during the LCI.

Methodology: *bottom-up approach*

1. *Selection and Definition of Impact Categories** (e.g., global warming, acidification, terrestrial toxicity)
- 2. *Classification**: assignment of the inventory data to different impact categories (e.g., classifying carbon dioxide emissions to global warming)
- 3. *Characterization**: quantification of category indicator results for each impact category by using characterization factors
- 4. *Normalization*: relates the magnitude of the impacts in the different categories to reference values (such as emissions in a nation)
- 5. *Grouping*: assigns impact categories to groups of similar impacts or ranking categories in a given hierarchy
- 6. *Weighting: converts indicator results* - emphasizing the most important potential impacts



Phases of a LCA study

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- **Goal and scope definition:** purpose and extent of the study, intended audience, options to be compared;
- **Inventory analysis (LCI):** collection of all the material and energy inputs and outputs (environmental burdens)
- **Impact assessment (LCIA):** evaluating the magnitude of potential environmental impacts
- **Interpretation:** recommendations and conclusions for decision