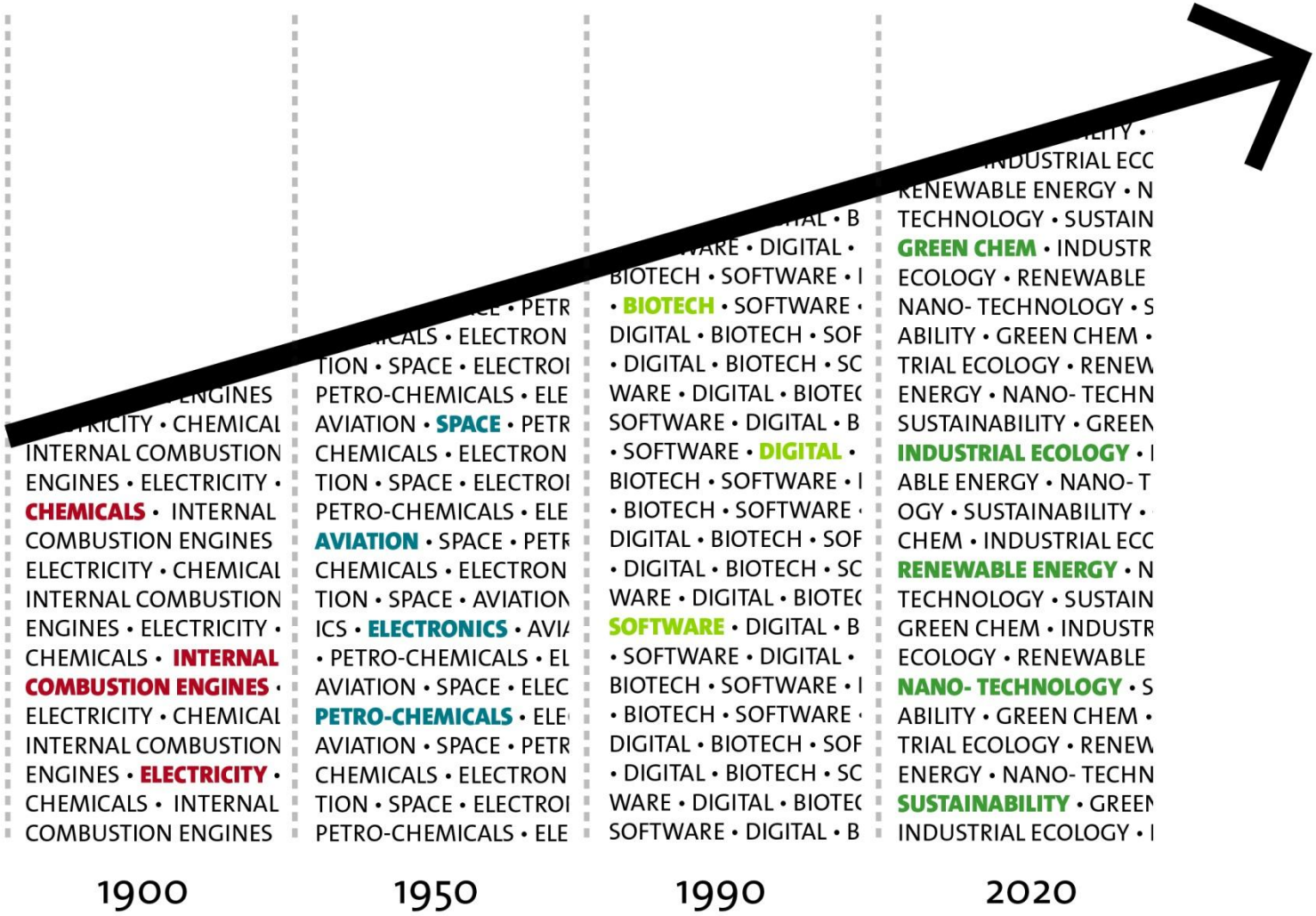
UL Environment Insights: Sustainability and Hi-Tech

We are universally committed to our mission:

Working for a safer world since 1894

UL founder William Henry Merrill following 1893 Chicago World's Fair

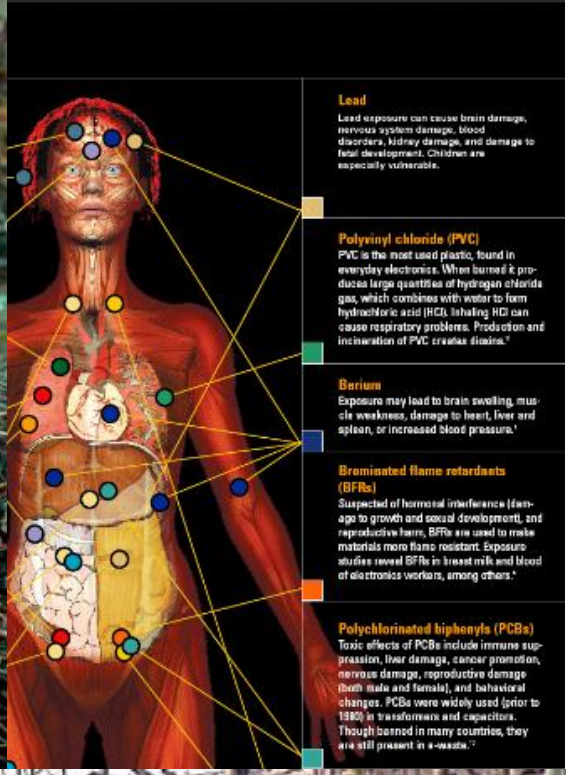
A HISTORY OF INNOVATION



Market Trend – Global Market Access

Setting the stage

Awareness is up…



Government and other procurement professionals are demanding green electronics.

The Federal government spends over $350 billion each year on a wide variety of products and service, under executive order 13423, these dollars are to be spent on Environmentally Preferable Products (EPP).

Government and Universities

STATE AND MUNICIPAL GOVERNMENTS



California Michigan Colorado Wisconsin

New York

….dozens of others (Illinois, Massachusetts, Minnesota, New Hampshire, New Jersey, Ohio, Pennsylvania, Rhode Island, Vermont, Washington DC.

…Municipal Government examples…Los Angeles County, Keene NH, Phoenix, AZ, Seattle, WA, and Leeds, UK

UNIVERSITIES

Of 300+ universities and colleges surveyed, 222 used EPEAT in their electronics purchasing decisions; of those, <u>70 purchased exclusively EPEAT-registered products (2010)</u>

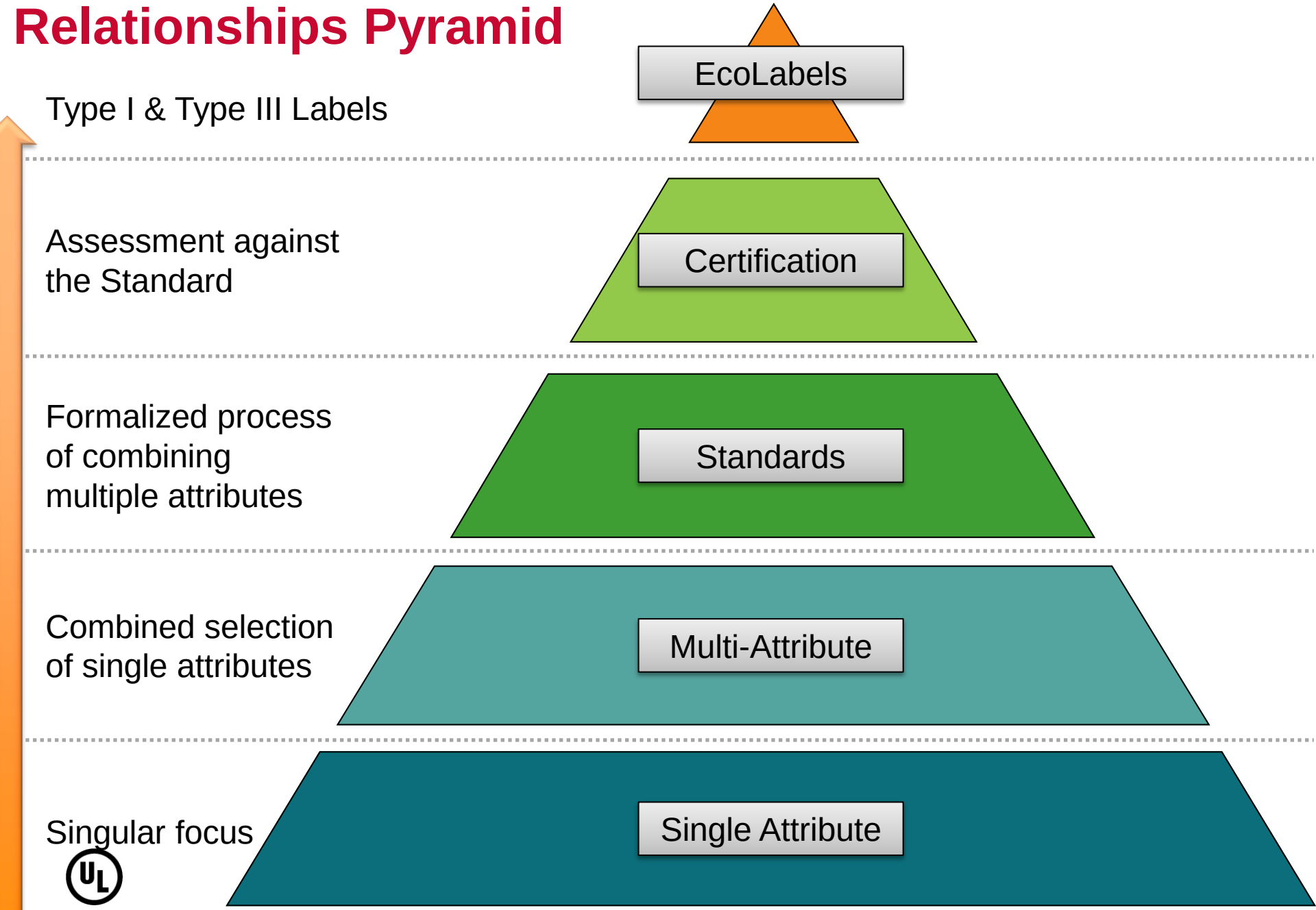
Some basics of Labeling

Types of Labels

The ISO 14020 series (14020, 14021, 14024, and 14025) is designed to assist businesses with measuring and communicating their efforts to minimize their environmental impacts.

Type I	Multi-attribute label developed by a third party
Type II	Self declared label developed by the producer
Type III	Life cycle assessment based communication tool for environmental performance data

Relationships Pyramid



The Trends

Performance Labels were the first step…

…Transparency is now the evolution

Presentation of product environmental impacts
Data calculated for product utilisation of 20 years.

Environmental indicators	Unit	For a EasyPac® E2C250N 3P			
		S + M + D + U	M	D	U
Raw Material Depletion	Y-1	$3.33\ 10^{-11}$	$3.07\ 10^{-11}$	$1.27\ 10^{-12}$	$2.57\ 10^{-14}$
Energy Depletion	MJ	$2.88\ 10^{5}$	$1.18\ 10^{5}$	10.4	$2.87\ 10^{5}$
Water Depletion	dm^3	$3.81\ 10^{2}$	73.8	$1.85\ 10^{-1}$	$3.74\ 10^{2}$
Global Warming Potential	g-CO_2	$1.81\ 10^{6}$	$6.37\ 10^{5}$	$7.80\ 10^{5}$	$1.60\ 10^{6}$
Ozone Depletion	g-CFC-11	$2.25\ 10^{-1}$	$1.43\ 10^{-1}$	$6.18\ 10^{-4}$	$2.23\ 10^{-1}$
Photochemical Ozone Creation	g-C_2H_4	$4.38\ 10^{2}$	1.96	$7.04\ 10^{-1}$	$4.36\ 10^{2}$
Air Acidification	g-H^+	$3.09\ 10^{3}$	3.89	$1.48\ 10^{-1}$	$3.05\ 10^{3}$
Hazardous Waste Production	kg	25.5	$4.09\ 10^{-1}$	$5.26\ 10^{-4}$	25.5

Increased TRANSPARENCY

- It used to be about downstream recycling
- Now, it is about Life Cycle Assessments (LCAs) through Environmental Product Declarations (EPDs)

What is an EPD?

EPD

Environmental Product Declaration

A comprehensive, internationally-harmonized report that documents the ways in which a product, throughout its lifecycle, affects the environment. Considered an ISO Type III ecolabel, EPDs do not act as product ratings rather they help purchasers better understand a product's sustainable qualities and environmental impacts.

Environmental Product Declarations

EPDs deliver **transparency** into a product's environmental impacts, **from cradle-to-grave.**

An EPD is a summary of the Life Cycle Assessment in a form that is able to be communicated with consistency and credibility.

Typically, an EPD will include information about a product's impact on:

ATMOSPHERE

Global Warming Potential refers to long-term changes in global weather patterns – including temperature and precipitation – that are caused by increased concentrations of greenhouse gases in the atmosphere.

Ozone Depletion Potential is the destruction of the stratospheric ozone layer, which shields the earth from ultraviolet radiation that's harmful to life, caused by human-made air pollution.

Photochemical Ozone Creation Potential happens when sunlight reacts with hydrocarbons, nitrogen oxides, and volatile organic compounds, to produce a type of air pollution known as smog.

WATER

Acidification Potential is the result of human-made emissions and refers to the decrease in pH and increase in acidity of oceans, lakes, rivers, and streams – a phenomenon that pollutes groundwater and harms aquatic life.

Eutrophication Potential occurs when excessive nutrients cause increased algae growth in lakes, blocking the underwater penetration of sunlight needed to produce oxygen and resulting in the loss of aquatic life.

EARTH

Depletion of Abiotic Resources (Elements) refers to the reduction of available non-renewable resources, such as metals and gases, that are found on the periodic table of elements, due to human activity.

Depletion of Abiotic Resources (Fossil Fuels) refers to the decreasing availability of non-renewable carbon-based compounds, such as oil and coal, due to human activity.

The Characteristics of an EPD

Objective, based on internationally-accepted and valid methods for life cycle assessment (LCA) to identify and focus on the most significant environmental aspects leading towards continuous improvement.

Credible, critically reviewed, approved and maintained by an independent verifier.

Neutral, absent of claims of environmental preference, valuations and predetermined environmental performance levels.

Comparable, 'Product-Specific Requirements' (PCRs) for selected product groups and services, describe harmonized LCA-rules for data collection, methodology, calculations and presentation of the results.

Open to all products and services, through its neutral character and non-selectivity, it has the widest range of applicability to all products and services.

Open to all interested parties, through easy access on the Internet.

Environmental impact-oriented, through the possibility to include assessments of potential environmental impacts.

Instructive, explain terms, definitions and concepts, as well as general information on relevant environment issues to help in the interpretation of the information.

The Utility of EPDs

Management tool for manufacturers, purchasers, the procurement and purchases functions of an organization, for product designers and for marketing strategy - by monitoring the product data and applying the outcomes to improve environmental performance.

Communication tool among manufacturers, suppliers, distributors, purchasers, contractors, and users by functioning as a source of environment information, while enhancing environmental awareness and interacting with internal environmental concerns.

Evaluation/Assessment tool for professionals, procurement, contractors and buyers - by using the EPD for making decision and for bench-marking environmental information.

Procurement tool for government, commercial and institutional purchasers.

Action tool for consumers and consumer groups by disseminating environmental information and product criteria, making comments, and asking for disclosure of consumer concerns.

Two Primary Components of EPDs

LIFE CYCLE ASSESSMENT

Life Cycle Assessment (LCA) is the technique used to assess environmental impacts associated with all the stages of a product's life from-cradle-to-grave (i.e., from raw material extraction through materials processing, manufacture, distribution, use, repair and maintenance, and disposal or recycling). LCAs can help avoid a narrow outlook on environmental concerns by:

- Compiling an inventory of **relevant energy and material inputs** and environmental releases;
- Evaluating the **potential impacts** associated with identified inputs and releases;
- Interpreting the results to help make **a more informed decision**.

Two Primary Components of EPDs

PRODUCT CATEGORY RULES

Product Category Rules (PCRs) are a set of rules, requirements and guidelines for developing Environmental Product Declarations (EPDs) for one or more product categories.

- ✓A Product Category is a **group of products** that can fulfill equivalent functions - for example, 'floor finishes,' 'concrete blocks' or 'insulation'
- ✓PCRs are particularly useful when the environmental impacts of products within a category group are to be compared - perhaps as part of a product specification process. **Rules provide a level playing field** for comparison of products.


WITHOUT environmental product declarations comparing life cycle assessments you would be comparing…
…because there are no instructions and guidelines on how to complete the assessment.

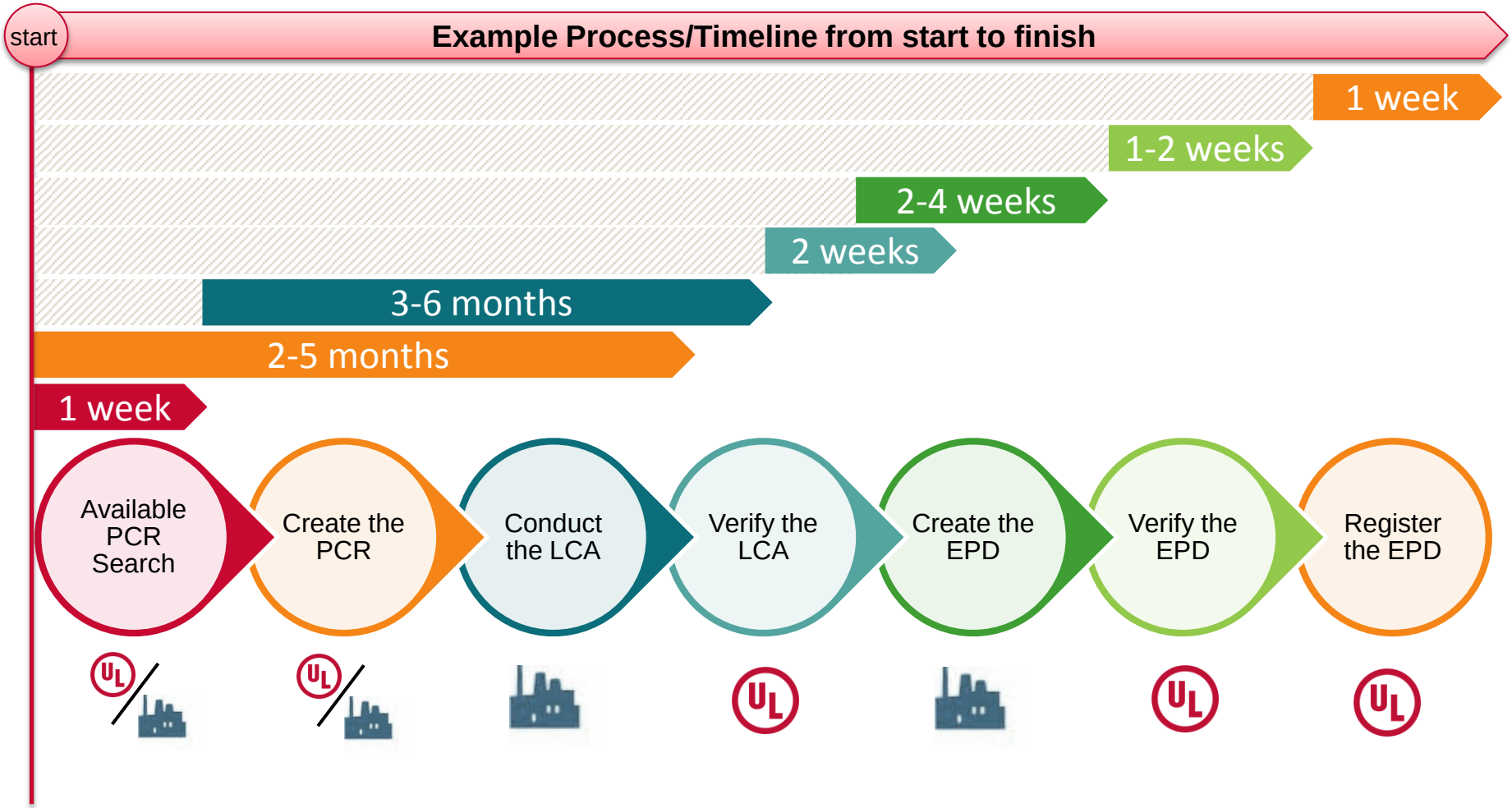

…but **WITH** environmental product declarations,
comparing life cycle assessments is like comparing…
…because the **instructions & guidelines** allow for comparable assessments of products in the same category

Importance of Product Category Rules

Environmental Product Declaration	Final Assessment & Declaration based on the PCR and the Standards
Life Cycle Assessment	
Product Category Rules	Product Specific Rules for LCA & EPD
ISO 14025	General Methods for EPD
ISO 14040/44	General Methods for LCA

UL Environment

Basic EPD Process & Timeline



= UL Responsibility

= Client Responsibility

= Joint/Mixed Responsibility

The Program Operator …

UL Environment is designated as a Program Operator, administering the program, facilitating the appropriate processes and ensuring credibility.

Meet the EPD

Meet the EPD

Materials and Descriptions

UN55D8000YF
SAMSUNG SMART LED TV

According to ISO 14025

List of Parts and Banned Substances

The following table outlines the main components of the product (includes all parts and substances that have a weight ratio (part weight/product weight) ≥ 0.5%).

Parts name	Substances
CHASSIS-BOTTOM	Aluminum
LGP-LED	Polymethyl methacrylate
TFT-LCD panel	TFT-LCD
COVER-REAR	Carbon Steel
BRACKET-STAND,NECK	Aluminum
BRACKET-STAND,FRONT	HGI
COVER-STAND,BASE	Polystyrene
COVER-MIDDLE	Polycarbonate
PCB Power board	Printed circuit board
GUIDE STAND	Polycarbonate
PCB MAIN board	Printed circuit board
BOX-01,SET OUT	Corrugated cardboard
CUSHION-SET	Exploded polystyrene

Functional Unit

The functional unit is defined as one unit of TFT-LCD television for the domestic Korean market.

System Boundaries

The Life Cycle Assessment includes all relevant cadle-to-grave environmental information for a television. The system boundaries include raw material production and processing, maincomponent manufacturing, assembly of a TV, packaging, trasportation, energy usage, as well as the end-of-life options (recycling, incineration for landfill disposal). The system boundaries of the product system are presented as follows:

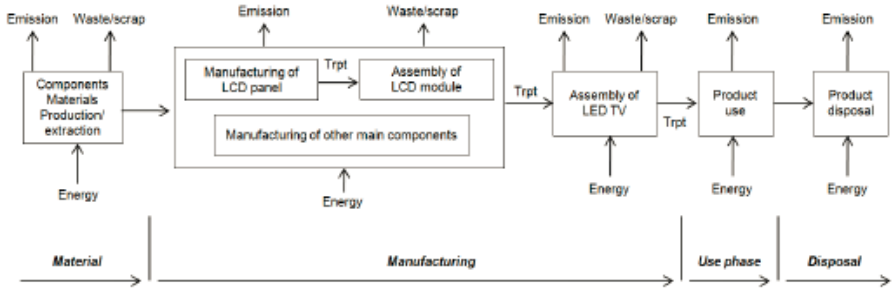


Figure 1: System boundary of the product system.

Meet the EPD

ENVIRONMENTAL IMPACTS

LG Electronics

LG 55LA6900
LG Cinema 3D Smart TV

According to ISO 14025

Life Cycle Impact Assessment

The target system was assessed by using the eco-indicators developed by the Ministry of Knowledge Economy (Ministry of Knowledge Economy, Korea), as shown in tables and figure below.

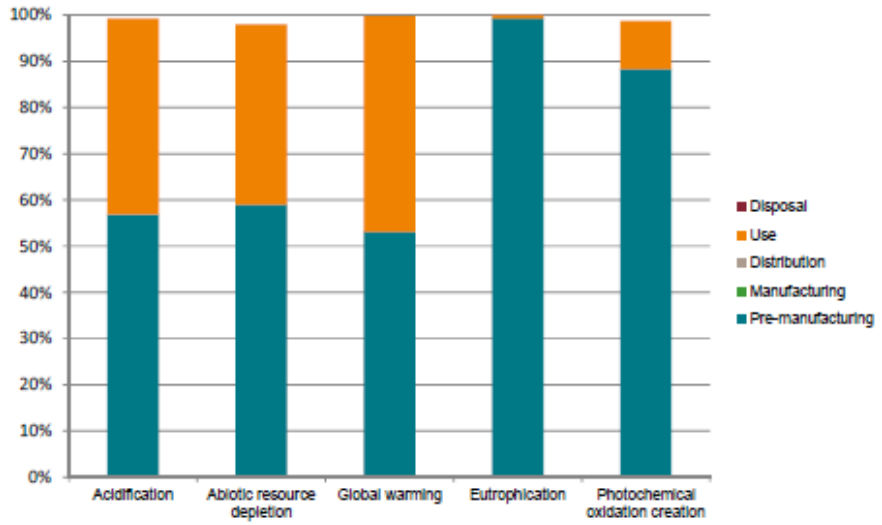
The potential impacts per life cycle stage

Impact category	Unit	Total	Pre-manufacturing	Manufacturing	Distribution	Use	Disposal
Acidification	kg SO2	4.56.E+00	2.63.E+00	5.26.E-04	5.98.E-03	1.96.E+00	-3.61.E-02
Abiotic resource depletion	1/yr	9.99.E+00	6.15.E+00	1.09.E-03	4.28.E-03	4.05.E+00	-2.19.E-01
Global warming	kg CO2	2.48.E+03	1.33.E+03	3.12.E-01	5.11.E-01	1.16.E+03	-6.35.E+00
Eutrophication	kg PO43-	5.15.E+01	5.11.E+01	9.81.E-05	1.06.E-03	3.65.E-01	-5.85.E-03
Photochemical oxidation creation	kg Ethylene	8.18.E-01	7.43.E-01	2.32.E-05	2.81.E-04	8.65.E-02	-1.13.E-02

Percentage of the environmental impact of the stage to the impact category

Impact category	Pre-manufacturing	Manufacturing	Distribution	Use	Disposal
Acidification	57.64%	0.01%	0.13%	43.01%	-0.79%
Abiotic resource depletion	61.55%	0.01%	0.04%	40.59%	-2.20%
Global warming	53.44%	0.01%	0.02%	46.78%	-0.26%
Eutrophication	99.30%	0.00%	0.00%	0.71%	-0.01%
Photochemical oxidation creation	90.78%	0.00%	0.03%	10.57%	-1.39%

Percentage of the environmental impacts of the stages to the impact category




Transparency
is The New
Green.

Thank You!

Contact Information

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