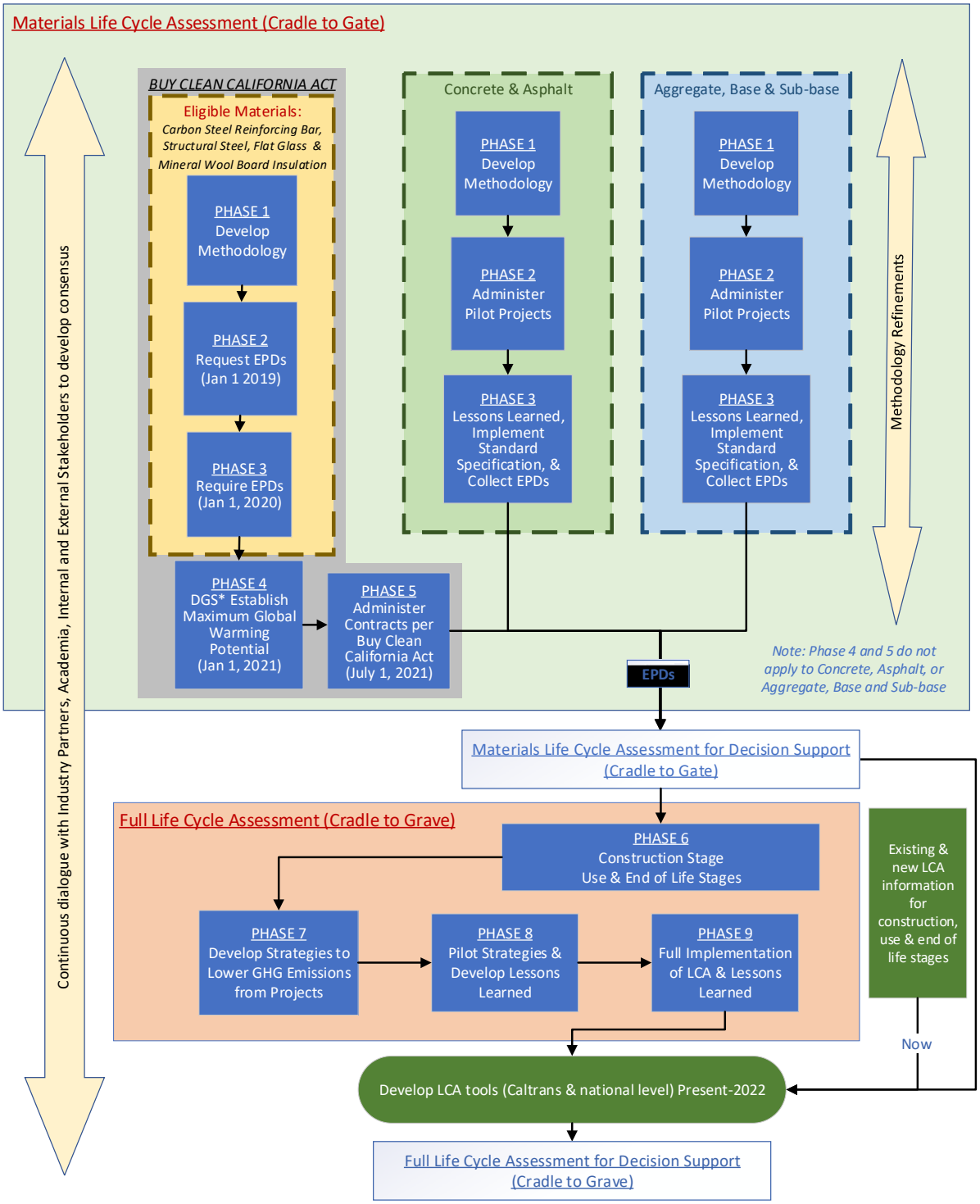
Environmental Product Declaration Implementation Project

VISION: *Use environmental product declarations (EPD)s to collect high-quality, regionally-applicable, standardized data for environmental impacts to support better decision-making using life cycle assessment (LCA), create market incentives for improvements, and reduce greenhouse gas (GHG) emissions and other environmental impacts from projects.*

Environmental Product Declarations for Transportation Materials



**CA Department of General Services*

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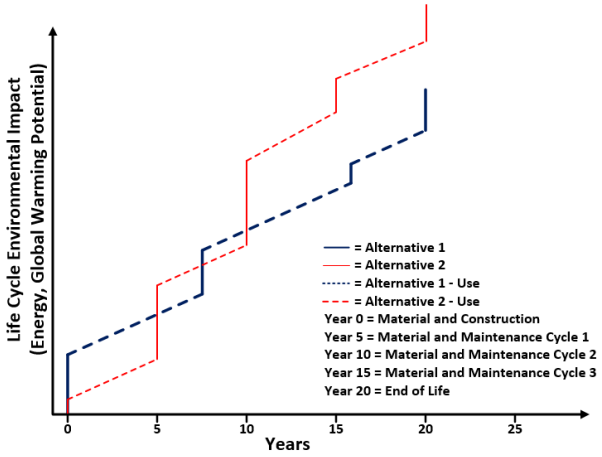
What is Life Cycle Assessment (LCA)?
A method for characterizing and quantifying environmental sustainability covering the complete life cycle of the system being analyzed and considering system-wide impacts for a product, policy, or system. When the full life cycle is considered the LCA is called a "cradle-to-grave" LCA. The International Standards Organization (ISO) provides guidance for LCA of all products (ISO 14040 and 14044) and the Federal Highway Administration has produced a framework for applying LCA to pavements.

What is an Environmental Product Declaration (EPD)?
A document that provides quantifiable environmental data based on an LCA that only covers the production stage of a material, referred to as a "cradle to gate" LCA, and not the whole life cycle. Example results for a given amount of material, called a functional unit, are shown in the figure at the left. EPDs are published by materials producers following Product Category Rules (PCR) that are prepared by their industry organization and reviewed by third-party critical reviewers to check that they meet international standards. ISO has existing standards for producing EPDs (ISO 14025) and a number of industries and ISO are currently working towards making PCRs more uniform between industries with respect to how they calculate and report information in EPDs following a new standard (ISO 21930). Different manufacturers of the same product will potentially have differences in the environmental impact of production because of differences in their manufacturing processes, their recipes for blending materials, their sourcing of raw materials, and how far they are transported.

Environmental Facts
Functional unit: 1 ton of asphalt concrete

Primary Energy Demand [MJ]	4.0×10^3
Non-renewable [MJ]	3.9×10^3
Renewable [MJ]	3.5×10^2
Global Warming Potential [kg CO_2-eq]	79
Acidification Potential [kg SO_2-eq]	0.23
Eutrophication Potential [kg N-eq]	0.012
Ozone Depletion Potential [kg CFC-11-eq]	7.3×10^{-9}
Smog Potential [kg O_3-eq]	4.4

Boundaries: Cradle-to-Gate
Company: XYZ Asphalt
RAP: 10%



Uses for Environmental Product Declarations (EPDs):

EPDs provide otherwise difficult to obtain information regarding Stages A1 through A3 (product stage) of the life cycle as shown in the figure to the right. That information is needed to do LCA on the complete life cycle of a Caltrans transportation structure that uses the material along with other materials, such as a bridge or pavement.

Product Stage			Construction Stage		Use Stage					End-Of-Life Stage				Benefits and Loads
A1	A2	A3	EXCLUDED FROM THIS STUDY											
Raw Materials Supply	Transport	Manufacturing	Transport	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	De-construction	Transport	Waste Processing	Disposal	Reuse, Recovery, Recycling Potential

Why is Caltrans interested in EPDs and LCA?

- Response to policy and legislation related to climate change (specifically AB 262[1]), sustainability, GHG reduction, and reduction of other pollutants.
- Data collection for materials production (product stage) intended for environmental impact benchmarking and life cycle assessment to support better decision-making in design, evaluation of standards and specifications and asset management.

[1]For more information on the Buy Clean California Act (Assembly Bill 262): Visit CA Department of General Services https://www.dgs.ca.gov/pd/Programs/Engineering/AB262.aspx