



Asociación Mexicana  
del Asfalto, A. C.

PAVIMENTANDO  
EL CAMINO  
HACIA UN  
FUTURO  
SOSTENIBLE



**SEMINARIO INTERNACIONAL DEL  
ASFALTO**

9 al 11 de Octubre, 2024, Monterrey, N.L.

# **Sustainable Pavements: Tactical and Strategic Needs and Opportunities**





Asociación Mexicana  
del Asfalto, A.C.



SEMINARIO INTERNACIONAL DEL ASFALTO

**Chait Bhat, Ph.D., LCACP**  
**Sustainability Engineer**  
**Asphalt Institute**  
**Lexington, KY**



**Email: [cbhat@asphaltinstitute.org](mailto:cbhat@asphaltinstitute.org)**





Asociación Mexicana  
del Asfalto, A.C.

# Overview of the Seminar



- Asphalt Institute
- Holistic Sustainability
- Tactical Policies and Industry Initiatives
- Strategic Needs and Industry Initiatives
- Considerations for Path Forward





Asociación Mexicana  
del Asfalto, A. C.

# About Asphalt Institute



- The Asphalt Institute is an international association of 131 petroleum asphalt producers, manufacturers and affiliated businesses.
- Founded in 1919, the Institute's members represent over 90% of the liquid asphalt produced in North America.





Asociación Mexicana del Asfalto, A.C.

# Technical Leadership



Industry Representation



Government and Academic-based Research



Technical Support to User Agencies



Key Alliances





Asociación Mexicana del Asfalto, A.C.

# Asphalt Pavement Supply-Chain



## SUPPLY CHAIN

### UPSTREAM

### ASPHALT BINDER

### DOWNSTREAM



American Petroleum Institute



AFPM



NATIONAL ASPHALT PAVEMENT ASSOCIATION



ASPHALT ROOFING MANUFACTURERS ASSOCIATION



ASPHALT EMULSION MANUFACTURERS ASSOCIATION



Pavement Preservation & Recycling Alliance



Asphalt Recycling & Reclaiming Association



STATE AGENCIES





# Holistic Sustainability



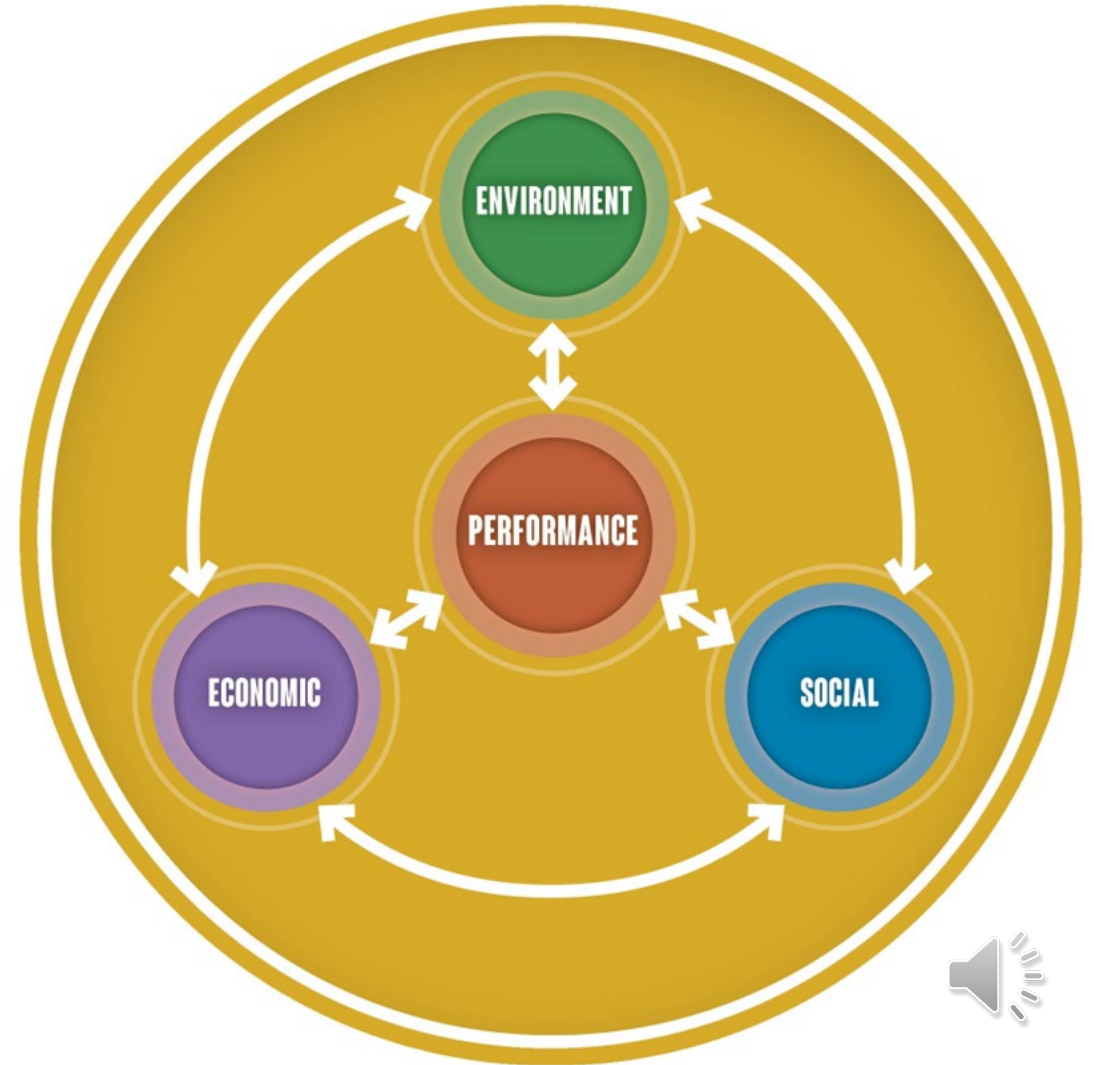


**Performance:** Achieve the engineering goals for which it was constructed

**Environment:** Preserve and (ideally) restore surrounding ecosystems

**Economy:** Use financial, human, and environmental resources economically

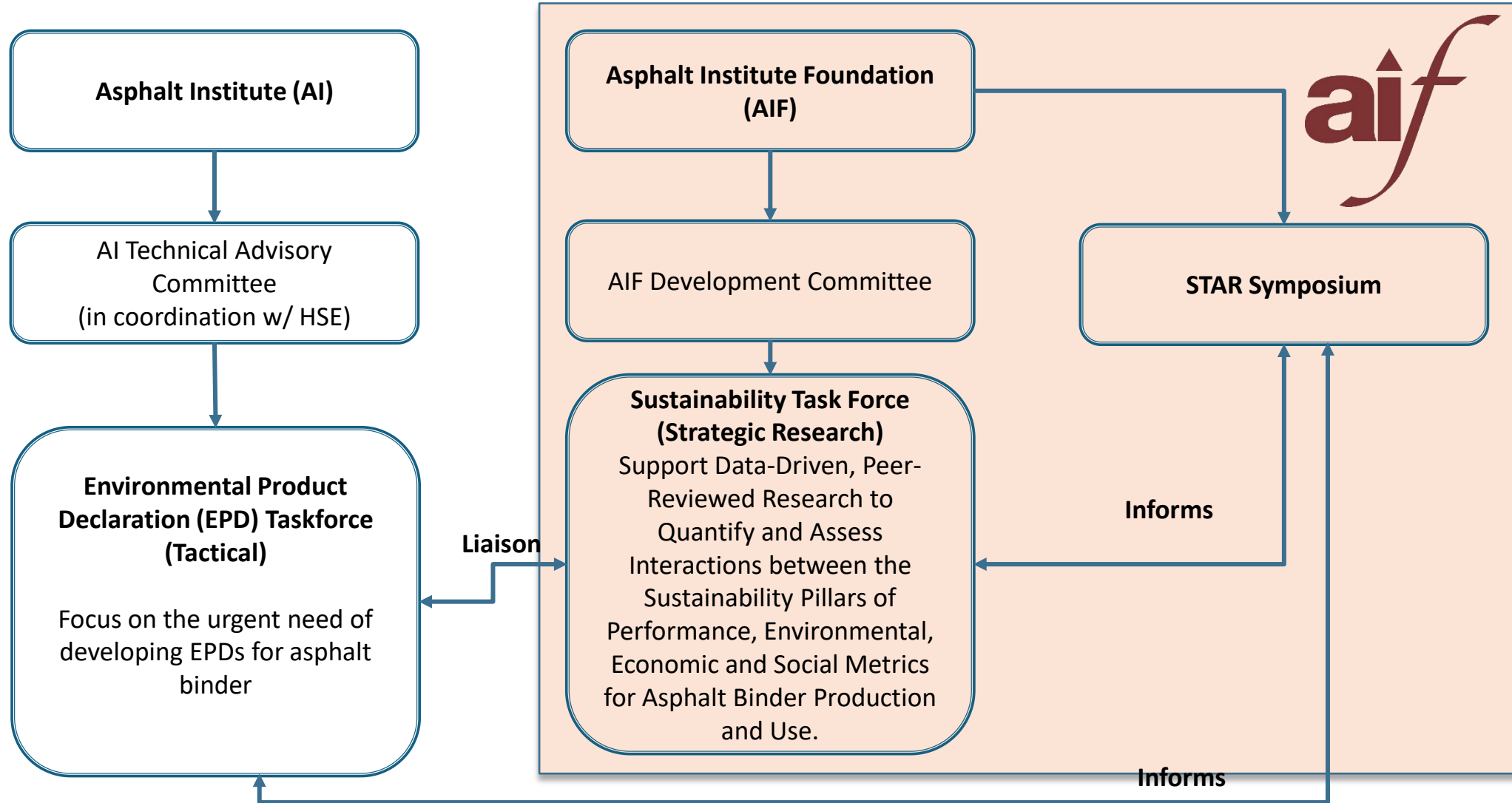
**Social:** Meet basic human needs such as health, safety, equity, employment, comfort, and happiness.







# Sustainability Vision





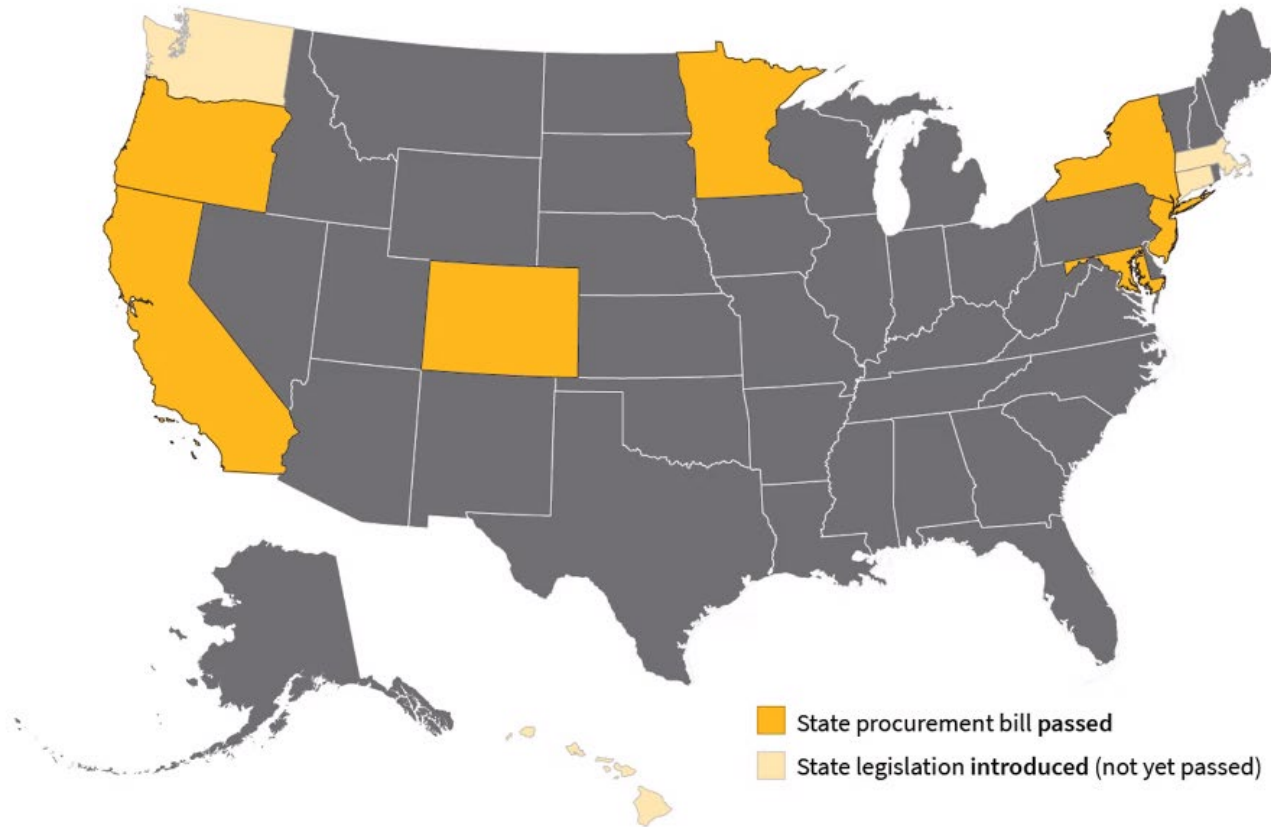
# Tactical Policies: Green Public Procurement





Asociación Mexicana del Asfalto, A.C.

# Buy Clean Policies at the State Level



Source: CLF

Information collected from state legislative websites.





# IRA Sections for low carbon construction materials



IRA Section	Agency	Funding	Purpose	Funds obligation deadline
60503	GSA Federal Buildings Fund	\$2.15B	To acquire and install materials/products for use in the construction or alteration of buildings that have substantially lower levels of embodied GHG emissions ( <i>as determined by EPA</i> )	9/30/26
60506	DOT FHWA	\$2B	To reimburse or provide incentives (up to 2% of incremental costs) to eligible recipients for the use of construction materials/products that have substantially lower levels of embodied GHG emissions ( <i>as determined by EPA</i> )	9/30/26
60116	EPA	\$100M	For administrative costs to develop ( <i>with GSA and DOT-FHWA</i> ) a program to identify and label construction materials/products that have substantially lower levels of embodied GHG emissions, based on EPDs and determinations by State agencies, as verified by EPA.	9/30/26
60112	EPA	\$250M	Grants and technical assistance to businesses, states, tribes and nonprofit organizations to support the development, enhanced standardization and transparency, and reporting criteria for EPDs for construction materials/products that include measurements of the embodied GHG emissions across all life cycle stages	9/30/31
50161	DOE	\$5.812B	For financial assistance for advanced technology retrofits for US industrial or manufacturing facilities that produce iron, steel, steel mill products, aluminum, cement, concrete, glass, and other energy intensive industrial processes	
	DOE	\$10B	For the 48C tax credit to expand clean technology manufacturing	
30002	HUD	\$837.5M	For direct loans and grants to improve climate resilience of affordable housing, including low-emission building materials/processes	
70006	FEMA		May provide financial assistance for costs associated with low-carbon materials	



Source: EPA

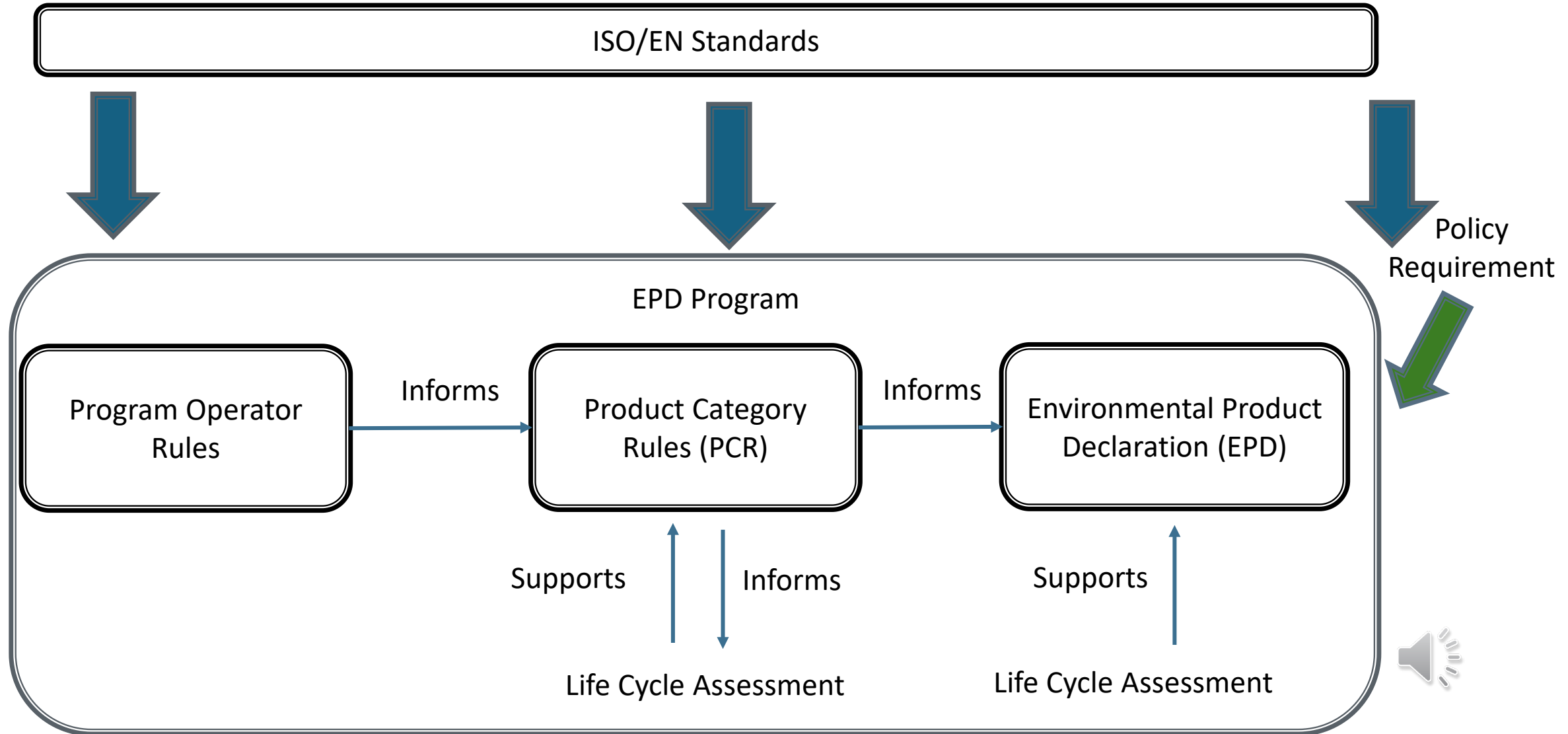


# Tactical Industry Initiatives





# EPD Program: An Overview

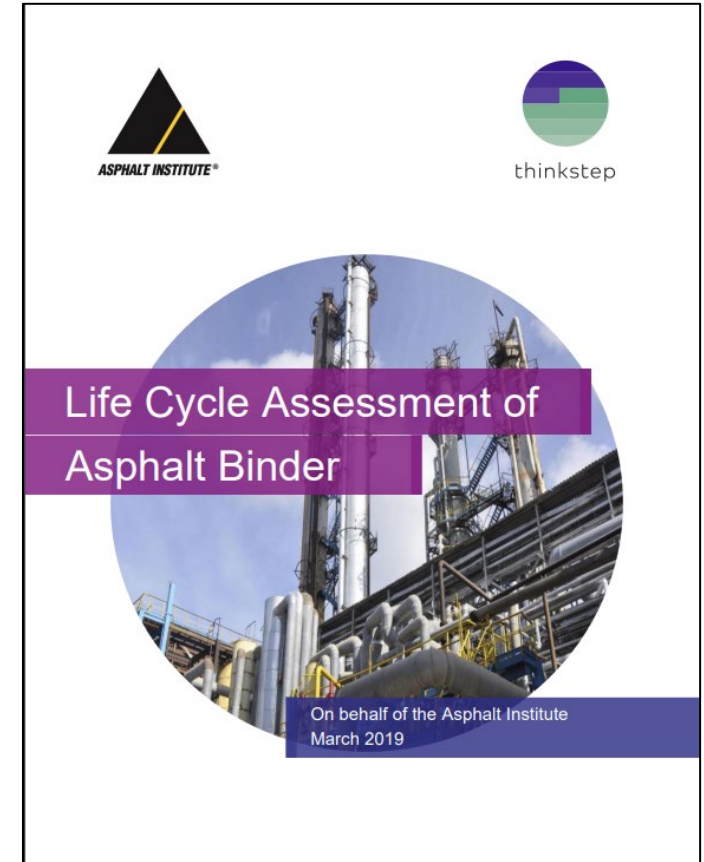




## • Existing Cradle to Gate Industry Average LCA for Asphalt Binder

- Published in 2019
- Started in 2016
- Contracted with Thinkstep, now Sphera
- Collected “Foreground” (process) data from 12 refineries and 10 terminals
- Used Sphera’s “Gabi” for background data
- Declared Unit: 1 kg of Asphalt Binder
  - Without additives
  - SBS Modified
  - GTR Modified
  - PPA Modified

## • Feeds into NAPA’s Mixture EPD Tool

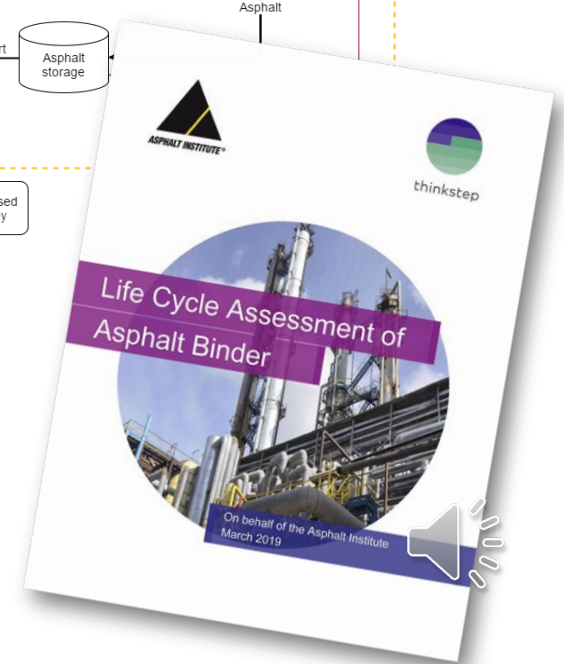
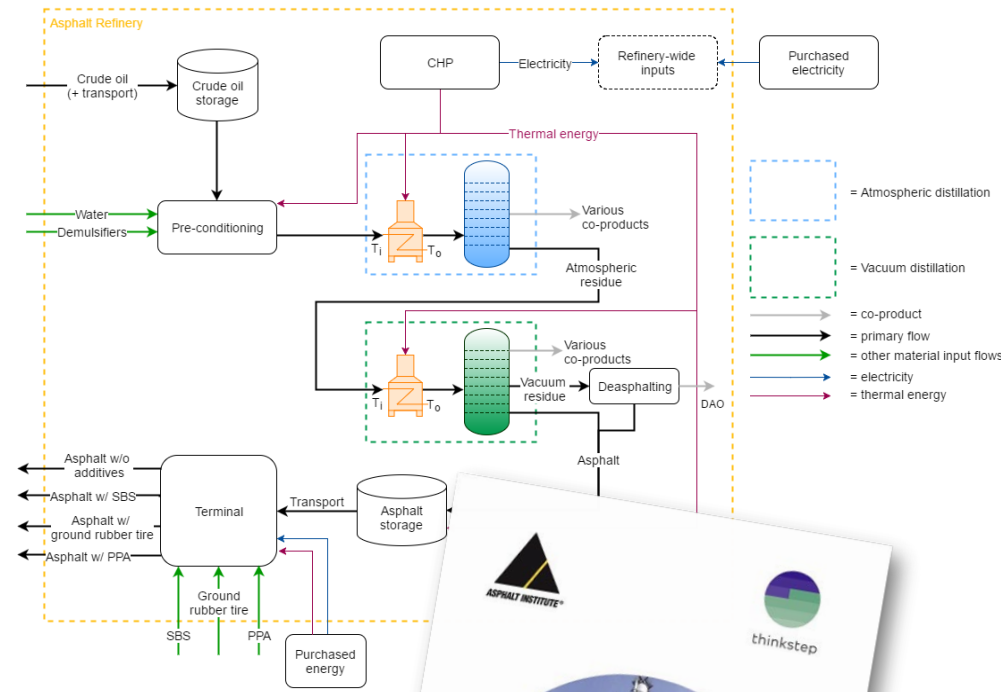


<https://www.asphaltinstitute.org/engineering/sustainability/life-cycle-assessment-of-asphalt-binder/>



## First of its kind EPD Taskforce provided path forward for:

- **Developing Product Category Rules (PCR) for asphalt binder using third-party Program Operator, SmartEPD**
- **Hired an LCA consultant Sphera to update AI's current Life Cycle Assessment (LCA) on asphalt binders in North America that was published in 2019**
- **Developing Environmental Product Declaration (EPD) web-based tool for product or facility specific EPDs**







# Strategic Needs





Climate Change:

***“A change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods”***

## Mitigation: Paris Climate Agreement

- Curb global emissions enough to cap global mean temperature increase to 1.5<sup>0</sup>-2<sup>0</sup>C relative to the pre-industrial era
- 120 countries, 733 cities, and over 3,200 businesses have committed to becoming net zero by 2050, making up 25% of global CO2 emissions and over 50% of world GDP (September 2021)





## Intergovernmental Panel on Climate Change:

*“Net zero emissions are achieved when anthropogenic emissions of greenhouse gases to the atmosphere are balanced by anthropogenic removals over a specified period”*

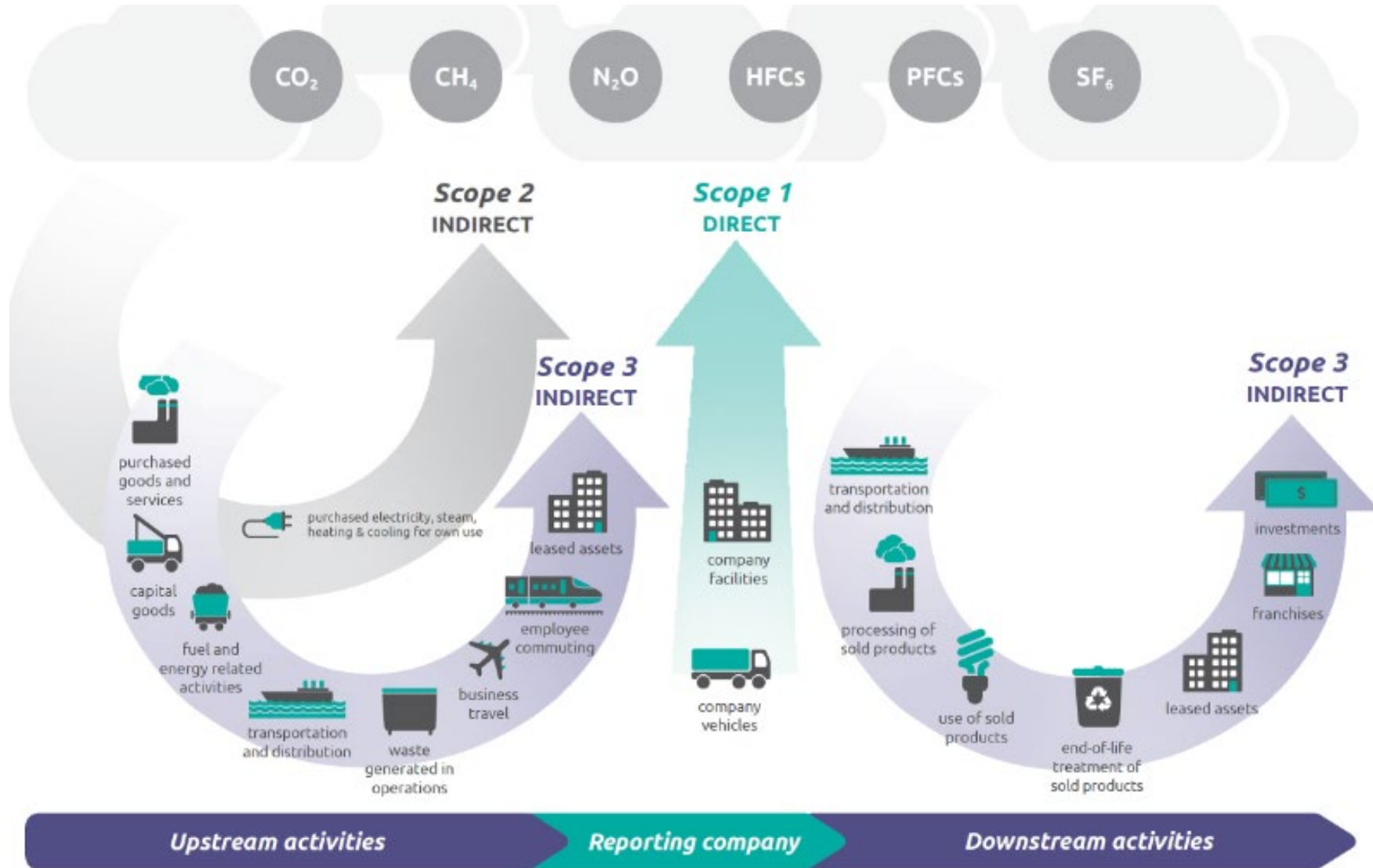
## Simpler Version:

*“The balance between the amount of greenhouse gas (GHG) that's produced and the amount that's removed from the atmosphere”*





# Scope 1, 2 and 3 emissions



Source: Source: WRI/WBCSD Corporate Value Chain (Scope 3) Accounting and Reporting Standard



# Strategic Industry Initiatives





- Title: “Analyzing the Petroleum Asphalt Binder Supply-Chain in a Net Zero World”
- AIF Sustainability Task Force: mid 2022 – mid 2023
- AIF Sustainability Oversight Panel (SOP): formed Sep 2023 – Prepared and Vetted RFP
- Consultant: Wood Mackenzie





Asociación Mexicana  
del Asfalto, A.C.

# AI Foundation Sustainability Research Project



SEMINARIO INTERNACIONAL DEL ASFALTO

# Associated Asphalt<sup>®</sup>



# Marathon Petroleum Company LP





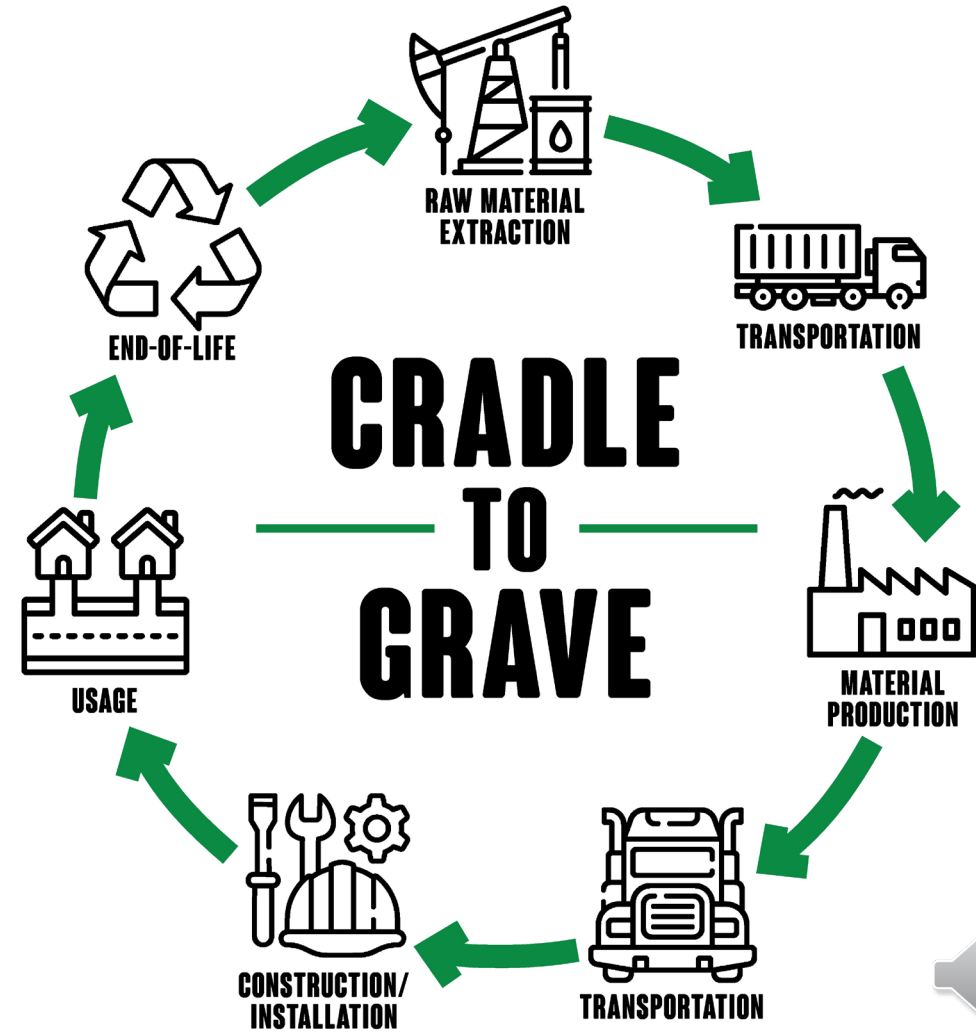
# Considerations for Path Forward





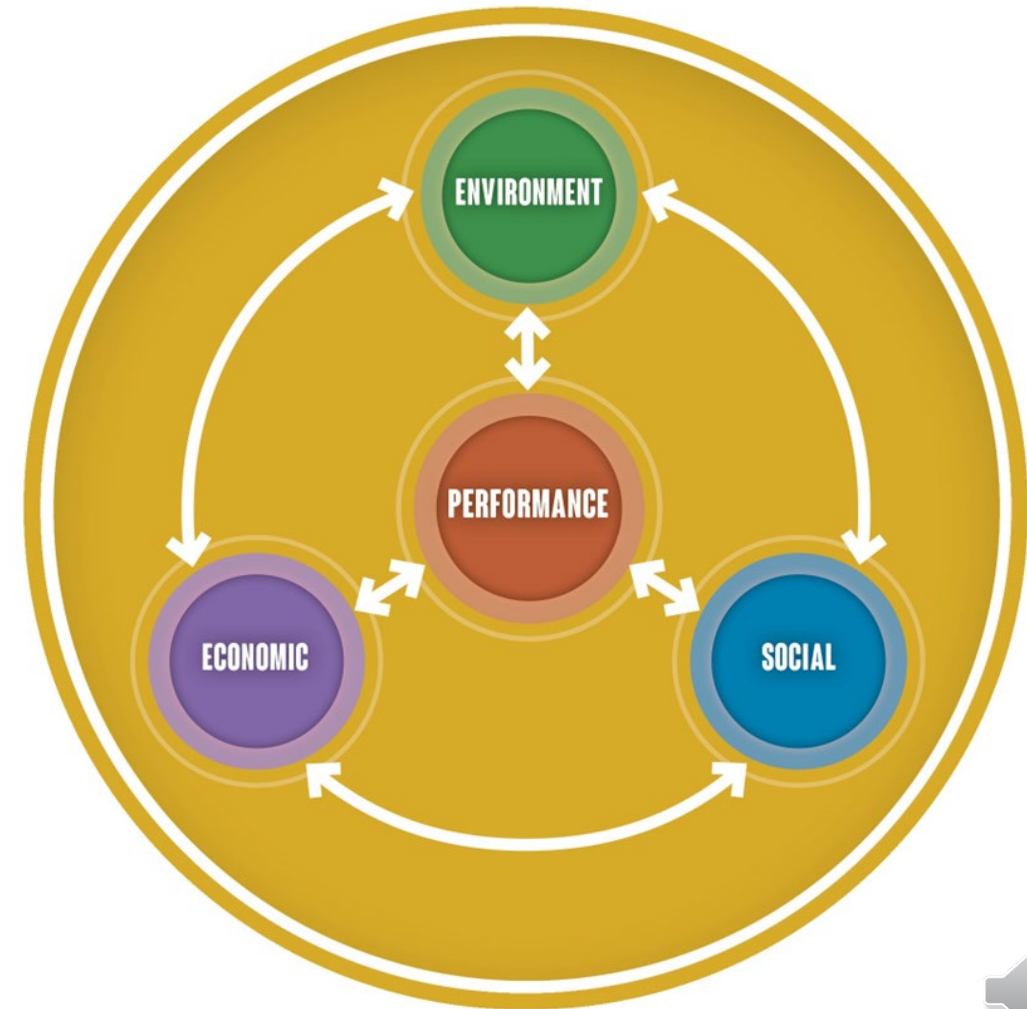


- What's Needed: A systematic analysis of the potential sustainability impacts (Four pillars) of products during their entire life cycle.
- Holistic Sustainability: Not just "Cradle to Gate" but Entire "Life-Cycle"





- Needed when evaluating projects/ processes between the correlated pillars
- Priorities and “Trade-Offs”
- Priorities need to be established as part of the ultimate goal of a project
  - “You cannot do everything, you must pick priorities”
- Context dependent





¡Muchas gracias!

**Chait Bhat, Ph.D., LCACP**  
**Sustainability Engineer**  
**Asphalt Institute**  
**Lexington, KY**



**Email: [cbhat@asphaltinstitute.org](mailto:cbhat@asphaltinstitute.org)**

