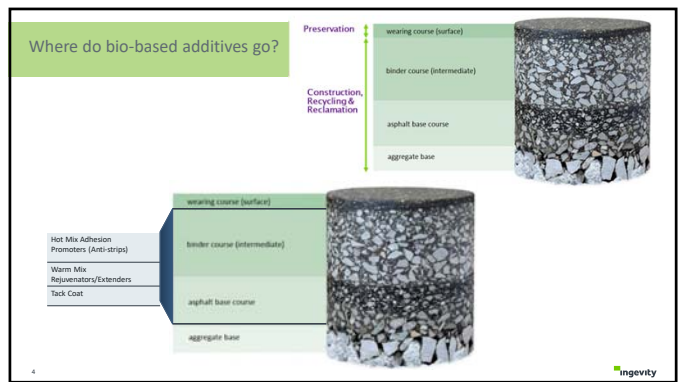
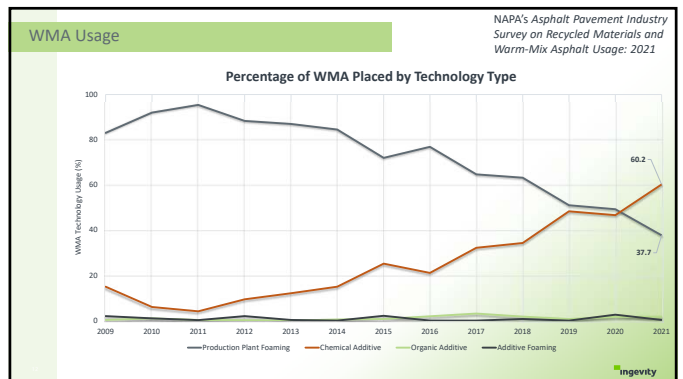
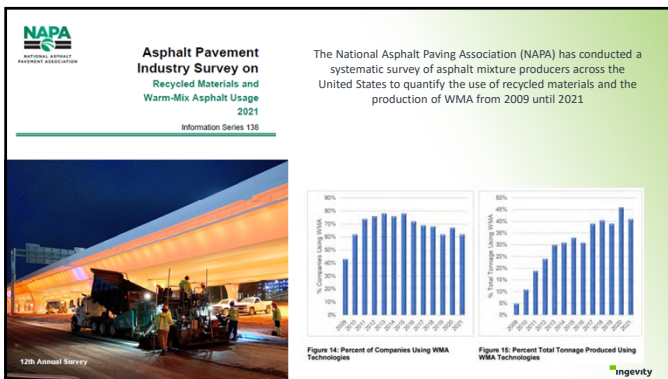
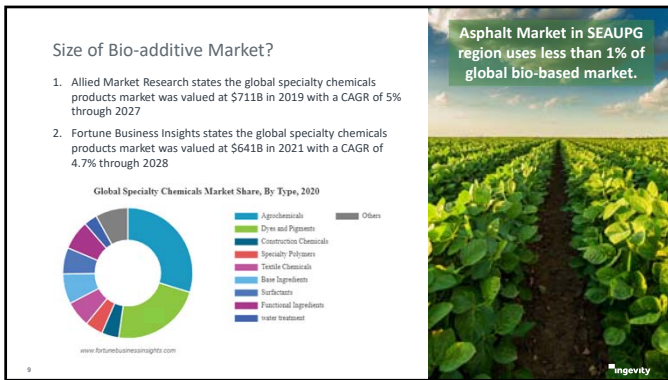
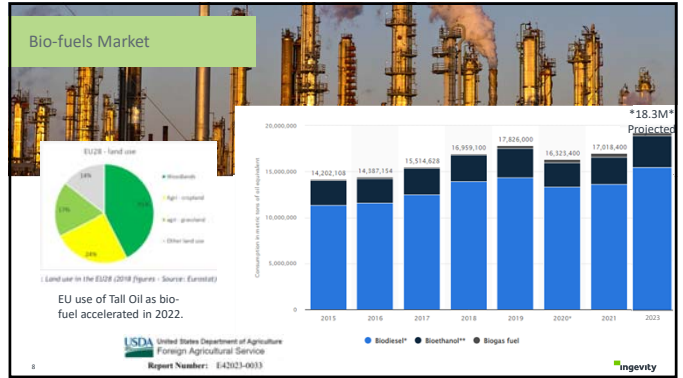
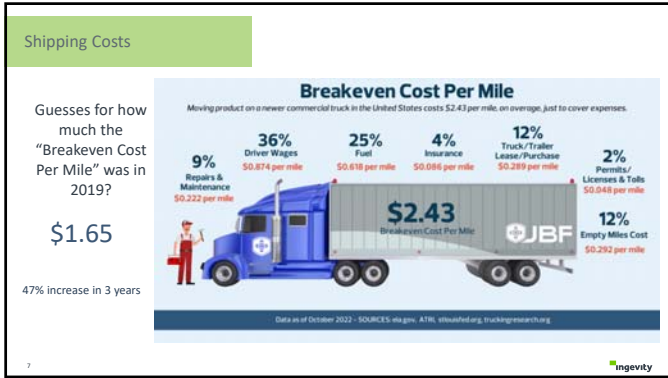


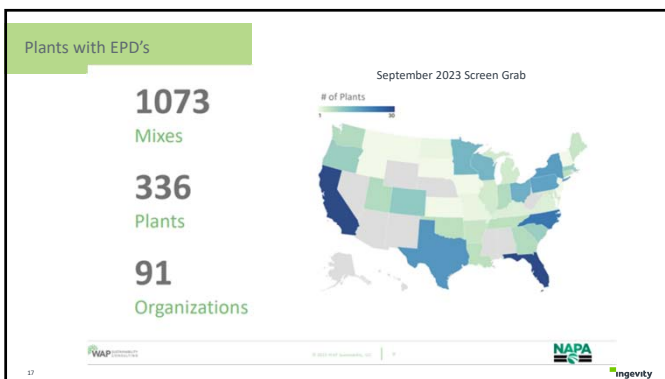
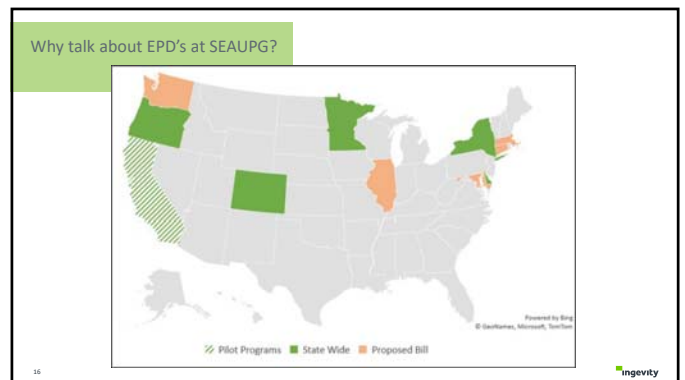
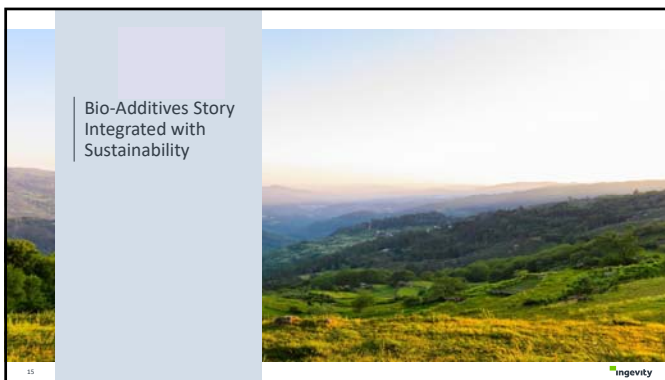
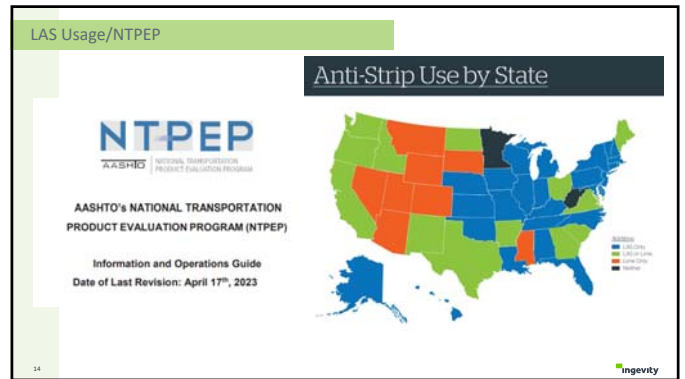
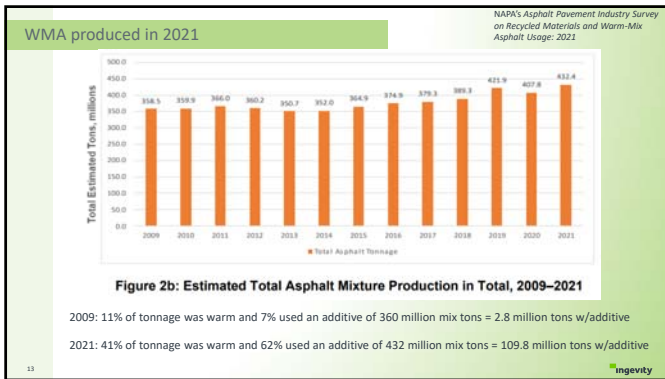


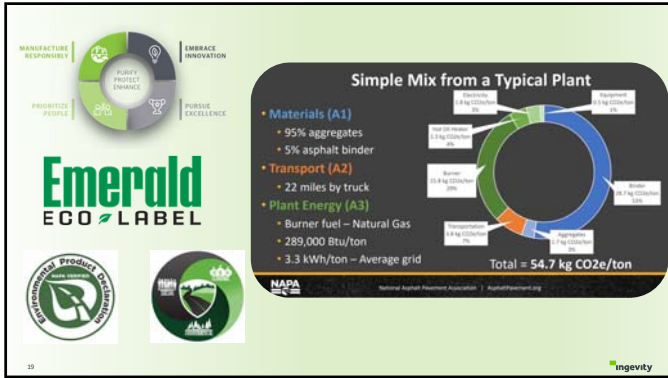
Outline

- ❑ Additive Market (Bio-based Additives)
- ❑ Where do Bio-Additives go?
- ❑ Increased Cost of Materials
- ❑ Increased Bio-Additive Usage
- ❑ Bio-based Story
- ❑ EPD's
- ❑ Questions









Environmental Product Declaration

Ingevity
 10000 N. Highway 42, Little Rock, AR 72205
 501-933-9804
 trey.wurst@ingevity.com

Product
 Evoflex P25

This party verified core EPD based on the EN15804:2012 A2

Company
 Evoflex Corporation
 10000 N. Highway 42, Little Rock, AR 72205
 trey.wurst@ingevity.com

Lead Reviewer
 Brad McAllister, WAP Sustainability & Co-Lead Reviewer
 Amlan Mukherjee, PhD, PE, Michigan Technological University

Most recent update was August 2023
 EN 15804:2012+A2:2019/AC:2021 serves as core PCR

How is this stuff calculated?

Tall-Oil Pitch (TOP) Example

Simply stated, 1 kg of TOP removed 3.04 kg of carbon dioxide from the atmosphere.

3.04 kg CO₂

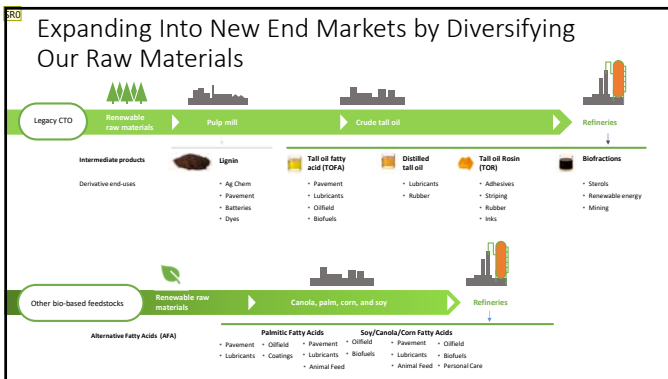
$0.83 \text{ g C} \times (1 \text{ mole C} / 12.01 \text{ g C}) \times (1 \text{ mole CO}_2 / \text{mole C}) \times (44.01 \text{ g CO}_2 / \text{mole CO}_2) = 3.04 \text{ g CO}_2$

EVOTHERM P25 Environmental Profile TRACI 2.1

Environmental profile (TRACI 2.1)

Parameter	Unit	Product stage		Delivery	Installation	Use and maintenance	End-of-life				Module D	
		A1, A2, A3	A4				A5	B1 - B7	C1	C2		C3
Global Warming	kg CO ₂ e	1778	04	MIND	MIND	MIND	MIND	MIND	MIND	MIND	MIND	MIND
Smog	kg O ₃	140E+02		MIND	MIND	MIND	MIND	MIND	MIND	MIND	MIND	MIND
Acidification	kg SO ₂ e	133E+02		MIND	MIND	MIND	MIND	MIND	MIND	MIND	MIND	MIND
Eutrophication	kg N+kg P	130E+02		MIND	MIND	MIND	MIND	MIND	MIND	MIND	MIND	MIND
Carbon sequestration	kg CO ₂ e	130E+02		MIND	MIND	MIND	MIND	MIND	MIND	MIND	MIND	MIND
Noncarcinogenics	CTUh	279E+04		MIND	MIND	MIND	MIND	MIND	MIND	MIND	MIND	MIND
Respiratory effects	kg PM2.5 eq	123E+02		MIND	MIND	MIND	MIND	MIND	MIND	MIND	MIND	MIND
Ecotoxicity	CTUh	25E+03		MIND	MIND	MIND	MIND	MIND	MIND	MIND	MIND	MIND
Global land occupation	Mt surplus	679E+03		MIND	MIND	MIND	MIND	MIND	MIND	MIND	MIND	MIND

Biogenic carbon (in product) (included in EN15804 results, not included in the TRACI results)
 Biogenic carbon: 0.83 kg carbon/ton product which is equal to -2.22 kg CO₂e



Questions

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 864-933-9804

Slide 23

SRO [@Siffert, Bob], [@RICHARDSON, CAMERON] this is the latest biorefinery slide Patty sent me
Steger, Richard, 2023-07-24T13:12:40.352

RCO 0 thanks Richard, I'll do some updating on my other stock slide decks.
RICHARDSON, CAMERON, 2023-07-24T14:39:08.888