Sustainability and Life Cycle Assessment of bitumen

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Life Cycle Inventory (LCI) of bitumen

Complementary Product Category Rules (c-PCR) for bitumen and bituminous binders

CEN/TC 336

Date: 2024-12

FprCEN/TR 18114:2024

CEN/TC 336

Secrétariat: AFNOR

Bitumes et liants bitumineux — Développement durable — Revue de la manière de prendre en compte les informations sur l'environnement

Bitumens and bituminous binders — Sustainability — Overview of how environmental information is addressed

Bitumen und bitumenhaltige Bindemittel — Nachhaltigkeit — Übersicht zu dem Umgang mit Umweltinformationen

ICS:

Descripteurs:

EUROPEAN COMMITTEE FOR STANDARDIZATION

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Eurobitume Life Cycle Inventory for Bitumen

- Historic background:
  - 1st Life Cycle Inventory (LCI) published in 1999
  - 2nd Version published in 2012
  - 3rd Version published in 2020/2022

Currently conducting the 4th Eurobitume LCI for bitumen study (V4.0 - 2025)

- Main reasons for the update
  - Need to provide **transparent, reliable and reputable environmental data for bitumen produced in Europe**
  - Update from reference year 2017 to 2023
  - Considering feedback from external review of 3rd Version regarding use of primary data for refinery and environmental impact of feedstock supply

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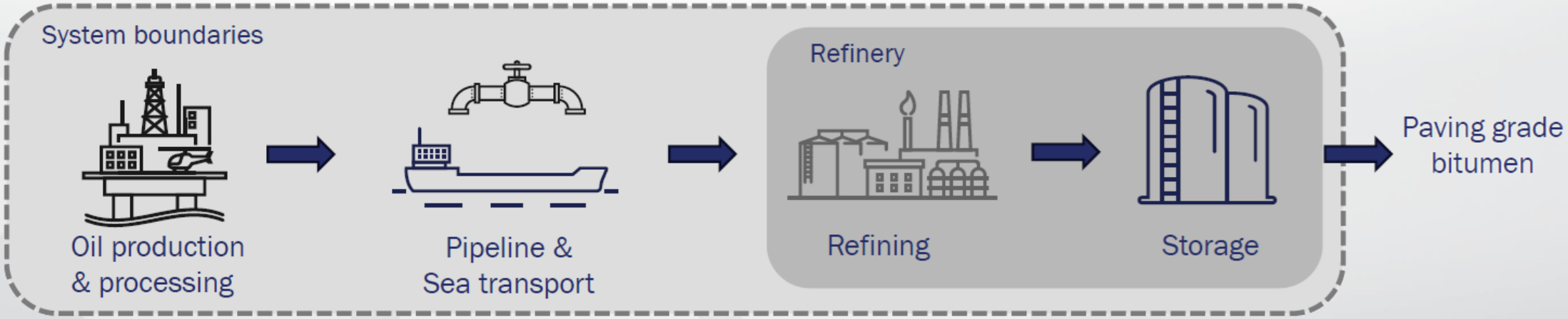
Goal & Scope of the study

- Reference unit is 1t of straight-run paving grade bitumen (EN 12591) as well as air-rectified and oxidized bitumen
- EB LCI is representative for straight-run paving grade bitumen production of (Eurobitume members) in the EU & UK.
- System boundaries are cradle-to-gate, including crude oil production, crude transport and refining and storage at the refinery



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LCI Analysis (LCIA)

- Study is a full LCA covering several environmental indicators (e.g. acidification or eutrophication)
- The Life Cycle Inventory (LCI) and/or the indicator results are foreseen to be used within LCAs, EPDs or similar studies of bitumen containing products.
- The indicators required under EN 15804+A2 “Sustainability of construction works – Environmental product declarations (EPD) – Core rules for the product category of construction products” are applied.
- A comparison of indicator results from version 3.1 with draft results indicated comparable results (acidification, photochemical ozone formation, abiotic resources – fossil fuels).

Core indicators required by EN 15804 +A2

Impact category	Indicator	Unit (expressed per functional unit or per declared unit)
Climate change – total [a]	Global Warming Potential total (GWP-total)	kg CO_2 eq.
Climate change - fossil	Global Warming Potential fossil fuels (GWP-fossil)	kg CO_2 eq.
Climate change - biogenic	Global Warming Potential biogenic (GWP-biogenic)	kg CO_2 eq.
Climate change - land use and land use change [b]	Global Warming Potential land use and land use change (GWP-luluc)	kg CO_2 eq.
Ozone Depletion	Depletion potential of the stratospheric ozone layer (ODP)	kg CFC 11 eq.
Acidification	Acidification potential, Accumulated Exceedance (AP)	mol H^+ eq.
Eutrophication aquatic freshwater	Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater)	kg PO_4 eq.
Eutrophication aquatic marine	Eutrophication potential, fraction of nutrients reaching marine end compartment (EP-marine)	kg N eq.
Eutrophication terrestrial	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	mol N eq.
Photochemical ozone formation	Formation potential of tropospheric ozone (POCP);	kg NMVOC eq.
Depletion of abiotic resources - minerals and metals [c] [d]	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	kg Sb eq.
Depletion of abiotic resources - fossil fuels [c]	Abiotic depletion for fossil resources potential (ADP-fossil)	MJ, net calorific value
Water use	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	m^3 world eq. deprived

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Main stages of the study

Good representativeness

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Main deliverables

- LCA report incl. critical review
- Document explaining changes between Version 3.1 (2020/2022) and the updated Version 4.0 (2025)
- LCI of bitumen dataset in ILCD format
  - XML file that contains a short documentation of the data set and the resource consumption and emission releases (LCI) associated with the supply of bitumen
  - File could be used by LCA practitioner to conduct life cycle studies about bitumen containing products)

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Environmental information of bitumen / bituminous binders

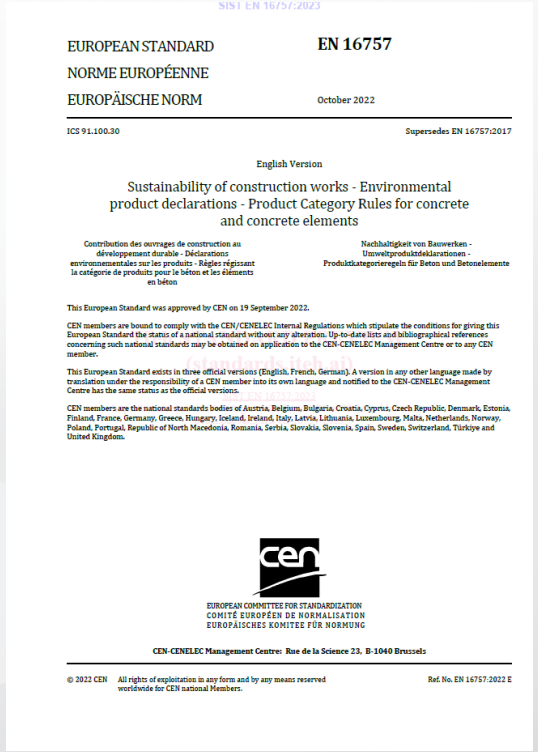
- Need to provide reliable information for downstream users of bitumen / bituminous binders to allow for the **environmental impacts of road infrastructures**
- Environmental Product Declaration (EPD) are growing in importance and developing rapidly
- **Need a framework to define common rules and requirements**

CEN/TC336 initiated the development of an EN standard on c-PCR for bitumens and bituminous binders

What is a c-PCR?

- **Rules and requirements** for specific construction product categories, to guide the establishment of EPDs or PCR (Product Category Rules), if necessary
- Help LCA practitioners to generate consistent, transparent and comparable results in the assessment of environmental impacts of products in the same product category
- **Standardised document**
- Complete the core rules defined in the EN 15804:2012+A2:2019 (Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products)
- Fully compliant with EN 15804

Example:
Cement and building lime - Environmental product declarations - Product category rules complementary to EN 15804 (EN 16908:2017+A1:2022)



SIST EN 16757:2023

EUROPEAN STANDARD **EN 16757**

NORME EUROPÉENNE

EUROPÄISCHE NORM October 2022

ICS 91.100.30 Supersedes EN 16757:2017

English Version

Sustainability of construction works - Environmental product declarations - Product Category Rules for concrete and concrete elements

Contribution des ouvrages de construction au développement durable - Déclarations environnementales sur les produits - Règles régissant la catégorie de produits pour le béton et les éléments en béton

Nachhaltigkeit von Bauwerken - Umweltproduktdeklarationen - Produktkategorieregeln für Beton und Betonelemente

This European Standard was approved by CEN on 19 September 2022.

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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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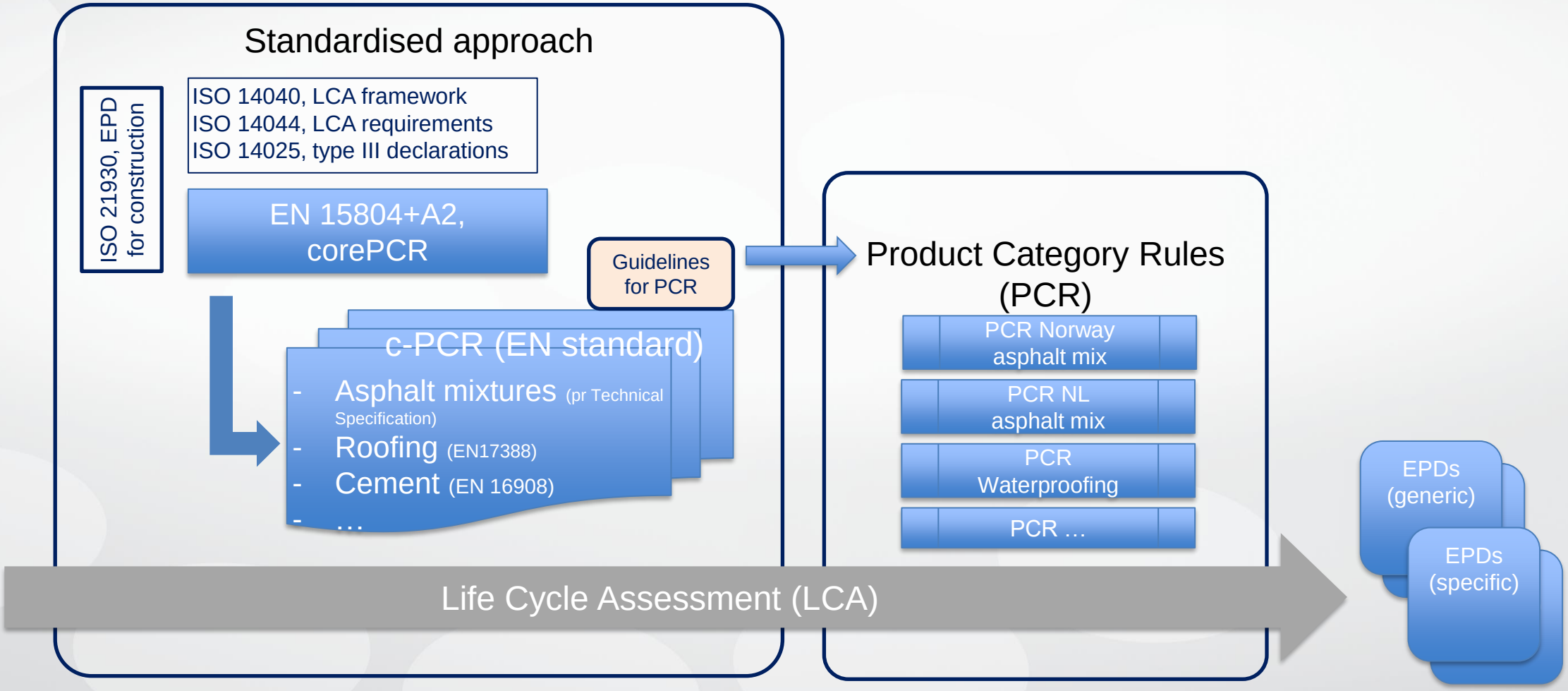
Environmental declaration frame



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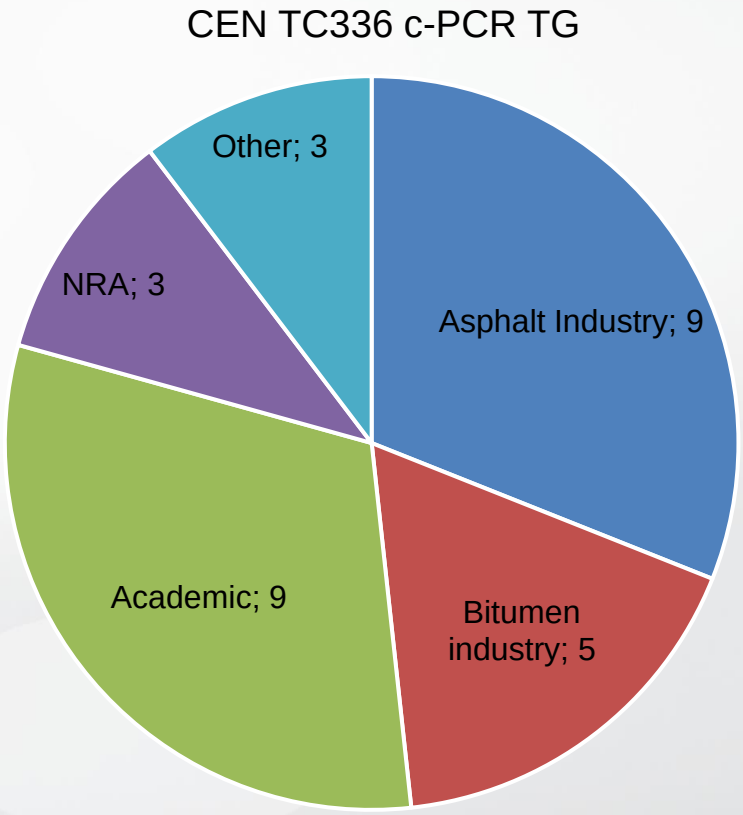
Standardisation process

- CEN/TC336 working on sustainability information
  - Technical Report CEN TR18114 Review on how sustainability is addressed
- **New task group** to develop standard on complementary Product Category Rules to EN15804, c-PCR on Bitumens for road application
  - 29 experts
  - Kick-off meeting on 14th October 2024



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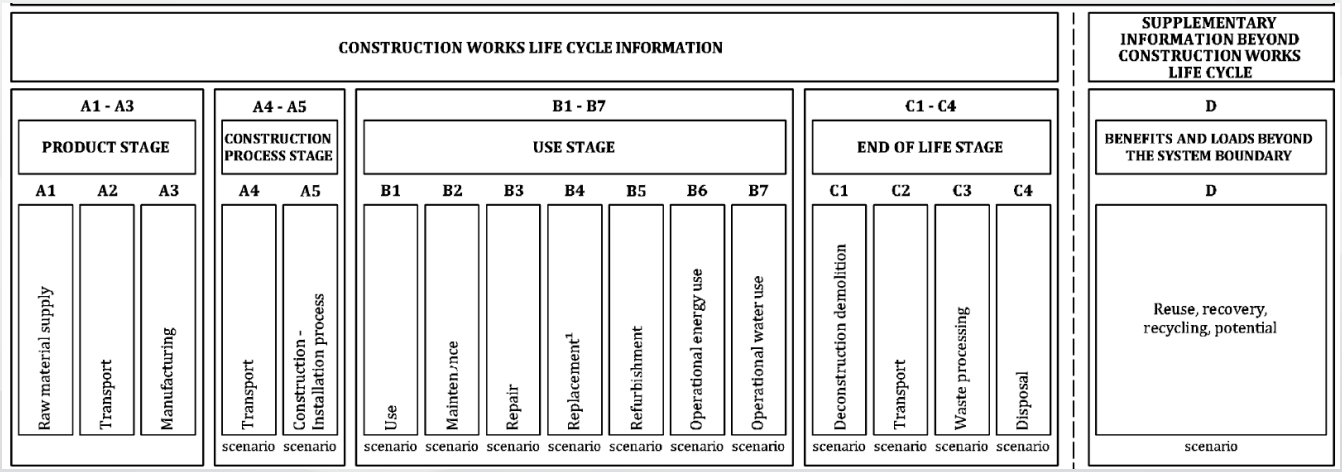
Key features to address

- **Bitumen is component of construction materials that cannot be separated at end-of-life**
  - May be subject of exemption from EN15804+A2: Cradle-to-gate (A1-A3) **vs.** (A1-A3) + C(end-of-life) + D(benefits & loads beyond the system)
  - Specificities for products containing biogenic carbon
- **Reference Service Life**
  - Bitumen may have different performances along the service life, at end-of-life
  - => is Reference Service Life relevant for bitumen / bituminous binders?



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Questions?

Thank you for your attention