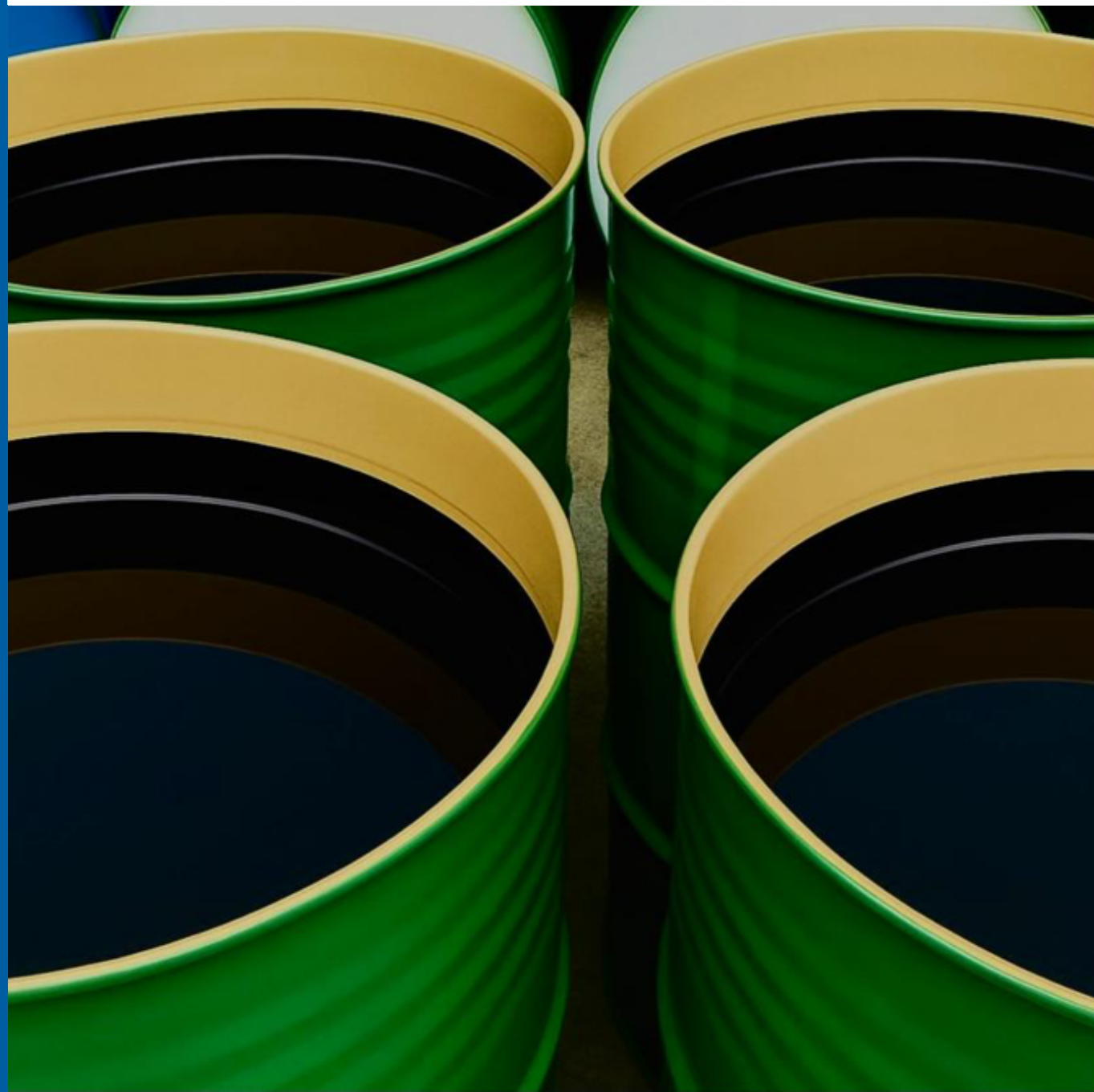
Environmental Product Declaration (EPD)
According to ISO 14025 and EN 15804+A2:2019

Trinidad Lake Asphalt (TLA)



Registration number:	EPD-Kiwa-EE-211853-EN
Issue date:	29-10-2025
Valid until:	29-10-2030
Declaration owner:	Lake Asphalt of Trinidad and Tobago (1978) Limited
Publisher:	Kiwa-Ecobility Experts
Programme operator:	Kiwa-Ecobility Experts
Status:	verified

1 General information

1.1 PRODUCT

Trinidad Lake Asphalt (TLA)

1.2 REGISTRATION NUMBER

EPD-Kiwa-EE-211853-EN

1.3 VALIDITY

Issue date: 29-10-2025

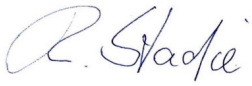
Valid until: 29-10-2030

1.4 PROGRAMME OPERATOR

Kiwa-Ecobility Experts
Wattstraße 11-13
13355 Berlin
DE

Raoul Mancke

(Head of programme operations, Kiwa-Ecobility Experts)



Dr. Ronny Stadie

(Verification body, Kiwa-Ecobility Experts)

1.5 OWNER OF THE DECLARATION

Declaration owner: Lake Asphalt of Trinidad and Tobago (1978) Limited

Address: Brighton, 630509 La Brea, Trinidad & Tobago

E-mail: sramlal@trinidadlakeasphalt.com

Website: https://trinidadlakeasphalt.com/

Production location: Lake Asphalt of Trinidad and Tobago (1978) Limited

Address production location: Brighton, 630509 La Brea, Trinidad & Tobago

1.6 VERIFICATION OF THE DECLARATION

The independent verification is in accordance with the ISO 14025:2011. The LCA is in compliance with ISO 14040:2006 and ISO 14044:2006. The EN 15804+A2:2019 serves as the core PCR.

☐ Internal ☒ External

Jekaterina Krastina, Kiwa Latvia

1.7 STATEMENTS

The owner of this EPD shall be liable for the underlying information and evidence. The programme operator Kiwa-Ecobility Experts shall not be liable with respect to manufacturer data, life cycle assessment data and evidence.

1.8 PRODUCT CATEGORY RULES

Kiwa-EE GPI R.3.0 (2025)

Kiwa-EE GPI R.3.0 Annex B1 (2025)

1.9 COMPARABILITY

In principle, a comparison or assessment of the environmental impacts of different products is only possible if they have been prepared in accordance with EN 15804+A2:2019. For the evaluation of the comparability, the following aspects have to be considered in particular: PCR used, functional or declared unit, geographical reference, the definition of

1 General information

the system boundary, declared modules, data selection (primary or secondary data, background database, data quality), scenarios used for use and disposal phases, and the life cycle inventory (data collection, calculation methods, allocations, validity period). PCRs and general program instructions of different EPD program operators may differ. Comparability needs to be evaluated. For further guidance, see EN 15804+A2:2019 and ISO 14025.

1.10 CALCULATION BASIS

LCA method R<THINK: Ecobility Experts | EN15804+A2

LCA software*: Simapro 9.6

Characterization method: RETHINK characterization method (see references for more details)

LCA database profiles: ecoinvent (for version see references)

Version database: v3.20 (2025-10-21)

** Simapro is used for calculating the characterized results of the Environmental profiles within R<THINK.*

1.11 LCA BACKGROUND REPORT

This EPD is generated on the basis of the LCA background report 'Trinidad Lake Asphalt (TLA)' with the calculation identifier ReTHiNK-111853.

2 Product

2.1 PRODUCT DESCRIPTION

This EPD is stated as the product-specific environmental performance for Trinidad Lake Asphalt (TLA).

Trinidad Lake Asphalt (TLA), also known as Trinidad Epuré, is a refined bituminous material derived from naturally occurring asphalt. It is used as a high-quality binder modifier that provides performance-enhancing properties to bituminous binders and Hot Mix Asphalts (HMA) in the asphalt industry. The natural asphalt originates as a semi-solid emulsion containing soluble bitumen, mineral matter, and other minor constituents. The mineral content contributes to improved resistance to skid and increases the stiffness of the binder. TLA serves as an ideal modifier for refinery bitumen used in heavy-duty Hot Mix Asphalt (HMA) pavements in various countries.

Trinidad Lake Asphalt (TLA) is refined from natural asphalt mined from the large natural asphalt deposit located in the La Brea Pitch Lake, Brighton, La Brea, in the south-western part of the island of Trinidad, West Indies.
Lake Asphalt of Trinidad & Tobago (1978) Limited is the sole custodian responsible for managing and extracting material from this deposit. TLA is produced by refining the naturally occurring asphalt to obtain a consistent, high-purity bituminous material suitable for industrial and construction applications.

TLA can be blended with refinery bitumen to produce the modified binder for asphalt mix production or can be added independently and directly at the asphalt plant during Hot Mix Asphalt (HMA) production.

Material	Composition
Bitumen	52 - 55%
Mineral matter	33 - 38%
Other constituents	10 - 15%

2.2 APPLICATION (INTENDED USE OF THE PRODUCT)

TLA can be blended with refinery bitumen to produce the modified binder for asphalt mix production or can be added independently of the refinery bitumen and directly at the asphalt plant during Hot Mix Asphalt (HMA) production. TLA is a natural bitumen based modifier and is completely compatible with refinery bitumen. Some of the most common types of asphalt pavement applications where TLA is used are Asphaltic Concrete, Mastic Asphalt, Stone Mastic Asphalt (SMA). TLA is also used in the waterproofing and coatings industries.

TLA has proved to be particularly effective in heavy duty pavements with specialized use in areas such as bridge-decks, airport runway and taxiway, sea ports, racetracks, tunnels, heavy traffic intersections and heavily trafficked roadways such as truck lanes.

TLA has been used in specialized projects due to its proven history of successful asphalt modification, providing performance characteristics such as high durability, resistance to permanent deformation and rutting, high fatigue resistance and high mixture stabilities which results in an asphalt pavement that is capable of providing a long service life with low requirements for maintenance interventions. Other properties TLA provides are:

- Improved pavement load carrying
- Improved whole-life pavement costs
- A light coloured, safer, surface
- Enhanced skid resistance properties due to mineral matter component
- Enhanced workability of asphalt mixtures
- Improved low temperature thermal cracking resistance
- Improved ability to display pigments effectively
- Effective blending with other additives
- Allows for reduced layer thickness

2 Product

- Improved adhesiveness and resistance to the effect of water
- Decreased rate of aging

2.3 REFERENCE SERVICE LIFE

RSL PRODUCT

Not applicable. The assumed RSL of 50 years does not represent a declared value under EN 15804+A2, nor is it verified for a specific use condition.

USED RSL (YR) IN THIS LCA CALCULATION:

50

2.4 TECHNICAL DATA

References	Parameters	Units	TLA	
			Min	Max
ASTM D5	Penetration at 25°C	0.1mm	0	5
ASTM D36	Softening Point – T R&B	°C	85	99
ASTM D92	Flash Point	°C	150	-
ASTM D2172	Solubility in Trichloroethylene (Bitumen content)	wt%	52	62
ASTM D2415	Ash Content	wt%	33	38
ASTM D70	Density	g/cm^3	1.0	1.5
ASTM D6	Loss on Heating, 50g, 5hrs at 163°C	wt%	-	2
ASTM D5	Retained Penetration after TFOT	°C	50	-

2.5 SUBSTANCES OF VERY HIGH CONCERN

The product does not contain any substances from the 'Candidate List of Substances of Very High Concern' (SVHC) in quantities of more than 0.1% (1,000 ppm).

2.6 DESCRIPTION PRODUCTION PROCESS

Natural asphalt extracted from the La Brea Pitch Lake in Trinidad is refined through controlled heating and purification processes to produce Trinidad Lake Asphalt (TLA). The lake measures approximately one hundred acres on the surface (41 hectares), and is estimated to be two hundred and fifty (250) feet (76 meters) deep in the centre. The naturally occurring material is mined in an open pit manner and then goes through a simple refining process in which the material is essentially dehydrated and all the extraneous organic matter is removed following which it is filled in 250kg steel drums for export. A more detailed explanation of the process is below:

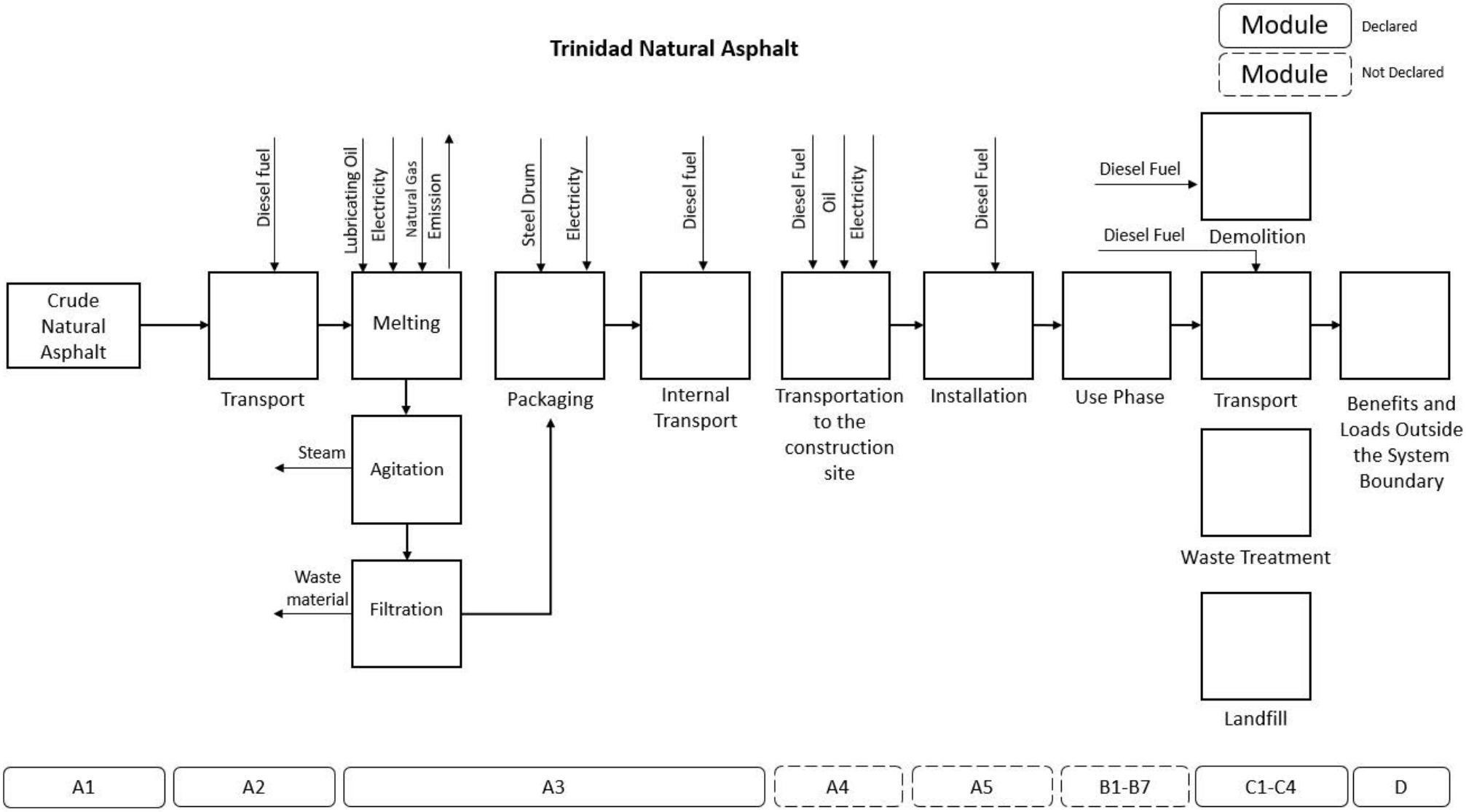
Mining: Crawler tractor fitted with a hydraulically operated bulldozing blade and rear-mounted ripper, rip and cross rip the surface on a selected area on the Pitch Lake. The tractor then bulldozes the fragmented asphalt into a mound from which the front end loader, loads the trailer tractor. This is then transported to a stockpile site.

Loading of Refining Stills: From this stockpile, the crude asphalt (pitch) is then loaded into rail wagons (buckets which hold one (1) Metric Tonne). When filled the rail wagons are drawn by hoist cables up a trestle to the refining Still (Open top vessels fitted with steam coils and a series of perforated pipes in the bottom for introduction of steam, used for agitating the mass of asphalt during melting).

Refining: The steam at an average temperature of 300 ^{o}F is passed through the coils, the crude asphalt gradually melts and the water it contains, about 25-30% is driven off as steam. This process is one of dehydration. After sixteen (16) hours the agitation lines are opened to assist the melting operation and to keep the mineral matter, present in the asphalt, in suspension. At the end of an average eighteen (18) hours the process is completed. The agitation lines are closed and the molten asphalt is drawn off from the bottom of the Still, passed through a fine screen to remove extraneous waste material, then filled into steel drums holding approximately 250 Kg each.

Packaging, storage and shipment: Four (4) drums are placed on a wooden pallet for easy movement by forklift. The drums are cooled, stored and are then loaded into 20ft or 40ft shipping containers and transported to the shipping port.

2 Product


Trinidad Natural Asphalt
Module
Declared
Module
Not Declared
Diesel fuel
Lubricating Oil
Electricity
Natural Gas
Emission
Steel Drum
Electricity
Diesel fuel
Diesel Fuel
Oil
Electricity
Diesel Fuel
Diesel Fuel
Diesel Fuel
Demolition
Crude Natural Asphalt
Transport
Melting
Packaging
Internal Transport
Transportation to the construction site
Installation
Use Phase
Transport
Benefits and Loads Outside the System Boundary
Steam
Agitation
Waste material
Filtration
Waste Treatment
Landfill
A1
A2
A3
A4
A5
B1-B7
C1-C4
D

3 Calculation rules

3.1 DECLARED UNIT

The declared unit is 1 metric ton of Trinidad Lake Asphalt

1 metric ton (1,000 kg) of Trinidad Natural Asphalt.

This is a specific product EPD.

Reference unit: ton (ton)

3.2 CONVERSION FACTORS

Description	Value	Unit
Reference unit	1	ton
Weight per reference unit	1000.000	kg
Conversion factor to 1 kg	0.001000	ton

3.3 SCOPE OF DECLARATION AND SYSTEM BOUNDARIES

This is a Cradle to gate with modules C1-C4 and module D EPD. The life cycle stages included are as shown below:

(X = module included, ND = module not declared)

A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X

The modules of the EN 15804 contain the following:

Module A1 = Raw material supply	Module B5 = Refurbishment
Module A2 = Transport	Module B6 = Operational energy use
Module A3 = Manufacturing	Module B7 = Operational water use
Module A4 = Transport	Module C1 = De-construction / Demolition
Module A5 = Construction - Installation process	Module C2 = Transport
Module B1 = Use	Module C3 = Waste Processing
Module B2 = Maintenance	Module C4 = Disposal
Module B3 = Repair	Module D = Benefits and loads beyond the product system boundaries
Module B4 = Replacement	

3.4 REPRESENTATIVENESS

This EPD is representative of Trinidad Lake Asphalt (TLA) produced by Lake Asphalt of Trinidad and Tobago (1978) Limited. The product is manufactured in Trinidad & Tobago, while the geographical reference area for the end-of-life scenarios considered in this EPD is the European Union.

3.5 CUT-OFF CRITERIA

Product stage (Modules A1-A3)

3 Calculation rules

All relevant input flows (e.g., raw materials, transport, energy use, packaging, etc.) and output flows (e.g., production waste) are considered in this LCA. Neglected input flows do not exceed 5% of the total energy use or mass, in accordance with EN 15804.

The following processes are excluded from the system boundaries:

- Long-term emissions
- The manufacture of equipment used in production, buildings or other capital goods;
- Transport of employees to the plant;
- Transport of employees within the plant;
- Disposal of packaging waste, which was not considered due to differing local disposal practices and regulatory conditions in customer countries;
- Research and development activities.

For A1, Land occupation and land transformation flows have been included in the modelling. Based on a disturbed area of 63,855 m^2, an annual ouput, and a mine lifetime of 400 years, the calculated flows per 1 kg crude asphalt are: 5.97 m^2·a occupation/kg and 3.73×10^{-5} m^2 transformation/kg. These values have been added in SimaPro as elementary flows.

End-of-life phase (C1-C4)

All relevant input flows (e.g. energy consumption for demolition or dismantling, transport for waste recovery, etc.) and output flows (e.g. waste recovery of the product at the end of its service life, etc.) are considered in this LCA. The neglected input flows therefore do not exceed the limit of 5% of energy consumption and mass.

Benefits and loads beyond the system boundary (Module D)

This LCA takes into account all relevant benefits and loads beyond the system boundary that result from reusable products, recyclable materials and/or useful energy carriers leaving the product system.

3.6 ALLOCATION

Allocations were avoided as far as possible. No by-products or co-products are produced during the manufacture of the analysed product. The energy requirements of production were determined based on energy consumption measurements for the product. Specific information on the allocations within the background data can be found in the documentation of the Ecoinvent datasets.

The packaging steel (51.2 kg per declared unit) contains 30.06 % secondary content according to the applied ecoinvent dataset. This corresponds to 15.391 kg of secondary material, which is reported under the SM indicator in Module A3.

No secondary fuels were used in the manufacturing process.

3.7 DATA COLLECTION & REFERENCE PERIOD

All process-specific data was recorded from January 2024 to December 2024. The quantities of raw materials, consumables and supplies used and the energy consumption were recorded and averaged from January 2024 to December 2024. The reference area is Trinidad and Tobago.

3.8 ESTIMATES AND ASSUMPTIONS

As no dataset exists for crude natural asphalt, a custom unit process was developed to represent its life cycle inventory. This process included diesel consumption for mining and lubricating oil for the machinery.

Electricity consumption was modeled using the national average grid mix for Trinidad and Tobago, due to the absence of site-specific electricity supply data. This approach reflects the typical fossil fuel–based energy profile of the region and provides a conservative estimate of associated environmental impacts.

3.9 DATA QUALITY

The quality of the geographical representativeness can be considered as ‘moderate’.

The quality of the technical representativeness can be considered as ‘good’.

The temporal representativeness can also be considered as ‘good’.

The overall data quality for this EPD can therefore be considered as ‘good’.

The secondary data from the EcoInvent database (2022, version 3.9.1) were used in the calculation as no primary data avaialble. The database is regularly reviewed and thus meets the requirements of DIN EN ISO 14040/44 (background data not older than 10 years). The background data meet the requirements of EN 15804+A2. The quantities of raw materials and supplies used and the energy consumption were recorded and averaged over the entire operating year.

The general rule that specific data from certain production processes or average data derived from certain processes must take precedence when calculating an EPD or LCA was observed. Data for processes over which the manufacturer has no influence were assigned to generic data/scenarios. When selecting this data, care was taken to always choose the data set/scenario that most realistically represents the processes.

3 Calculation rules

3.10 POWER MIX

This Environmental Product Declaration (EPD) applies the “location-based approach” in accordance with the energy mix of Trinidad and Tobago, as no site-specific electricity supply contract was available.

The electricity generation data for Trinidad and Tobago from Ecoinvent 3.9.1 is used. The overall GWP of the electricity mix used is 0.659 kg CO_2 equivalent per kWh.

4 Scenarios and additional technical information

4.1 DE-CONSTRUCTION, DEMOLITION (C1)

The following information describes the scenario for demolition at end of life.

Description	Amount	Unit
(ei3.9.1) Hydraulic excavator (average) [NMD generic]	0.016	hr

4.2 TRANSPORT END-OF-LIFE (C2)

The following distances and transport conveyance are assumed for transportation during end of life for the different types of waste processing.

Waste Scenario	Transport conveyance	Not removed (stays in work) [km]	Landfill [km]	Incineration [km]	Recycling [km]	Re-use [km]
(ei3.9.1) Asphalt road constructions, SMA & AC Surf (Benefits 50%/50%) [Asphalt PCR NL v2.0]	(ei3.9.1) Standard transport conveyances C2 [PCR asphalt v2.0]	0	0	0	45	0

The transport conveyance(s) used in the scenario(s) for transport during end of life has the following characteristics.

	Value and unit
Vehicle type used for transport	(ei3.9.1) Standard transport conveyances C2 [PCR asphalt v2.0]
Fuel type and consumption of vehicle	Diesel, low sulfur EURO 5=0,01917 kg/tkm / EURO 6= 0,01922kg/tkm
Capacity utilisation (including empty returns)	Loaded up and 70% loaded return
Bulk density of transported products	2000-2370kg/m3
Volume capacity utilisation factor	1

	Value and unit
Vehicle type used for transport	(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO)
Fuel type and consumption of vehicle	not available
Capacity utilisation (including empty returns)	50 % (loaded up and return empty)
Bulk density of transported products	inapplicable
Volume capacity utilisation factor	1

4 Scenarios and additional technical information

4.3 END OF LIFE (C3, C4)

The scenario(s) assumed for end of life of the product are given in the following tables. First the assumed percentages per type of waste processing are displayed, followed by the assumed amounts.

Waste Scenario	Region	Not removed (stays in work) [%]	Landfill [%]	Incineration [%]	Recycling [%]	Re-use [%]
(ei3.9.1) Asphalt road constructions, SMA & AC Surf (Benefits 50%/50%) [Asphalt PCR NL v2.0]	NL	0	0	0	100	0

Waste Scenario	Not removed (stays in work) [kg]	Landfill [kg]	Incineration [kg]	Recycling [kg]	Re-use [kg]
(ei3.9.1) Asphalt road constructions, SMA & AC Surf (Benefits 50%/50%) [Asphalt PCR NL v2.0]	0.000	0.000	0.000	1000.000	0.000
Total	**0.000**	**0.000**	**0.000**	**1000.000**	**0.000**

4.4 BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY (D)

The presented Benefits and loads beyond the system boundary in this EPD are based on the following calculated Net output flows in kilograms and Energy recovery displayed in MJ Lower Heating Value.

Waste Scenario	Net output flow [kg]	Energy recovery [MJ]
(ei3.9.1) Asphalt road constructions, SMA & AC Surf (Benefits 50%/50%) [Asphalt PCR NL v2.0]	1000.000	0.000
Total	**1000.000**	**0.000**

5 Results

For the impact assessment long-term emissions (>100 years) are not considered. The results of the impact assessment are only relative statements that do not make any statements about end-points of the impact categories, exceedance of threshold values, safety margins or risks. The following tables show the results of the indicators of the impact assessment, of the use of resources as well as of waste and other output flows.

5.1 ENVIRONMENTAL IMPACT INDICATORS PER TON

CORE ENVIRONMENTAL IMPACT INDICATORS EN 15804+A2

Abbr.	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq.	3.21E-1	1.88E+1	7.39E+2	7.58E+2	8.88E-1	3.75E+0	1.73E+0	0.00E+0	-2.60E+1
GWP-f	kg CO_2 eq.	3.20E-1	1.88E+1	7.36E+2	7.55E+2	8.88E-1	3.69E+0	1.73E+0	0.00E+0	-2.59E+1
GWP-b	kg CO_2 eq.	4.39E-4	6.34E-3	3.10E+0	3.11E+0	1.23E-4	6.44E-2	1.84E-4	0.00E+0	-4.61E-2
GWP-luluc	kg CO_2 eq.	2.73E-4	1.19E-2	2.10E-1	2.22E-1	9.99E-5	1.61E-3	1.46E-4	0.00E+0	-1.85E-2
ODP	kg CFC 11 eq.	1.19E-8	2.70E-7	1.43E-5	1.46E-5	1.41E-8	8.74E-8	2.11E-8	0.00E+0	-1.68E-6
AP	mol H+ eq.	1.75E-3	1.04E-1	1.37E+0	1.48E+0	8.23E-3	1.06E-2	7.41E-3	0.00E+0	-2.01E-1
EP-fw	kg P eq.	7.23E-6	2.08E-4	1.33E-2	1.35E-2	3.21E-6	3.29E-5	4.75E-6	0.00E+0	-4.13E-4
EP-m	kg N eq.	3.50E-4	3.99E-2	3.71E-1	4.11E-1	3.81E-3	2.90E-3	3.34E-3	0.00E+0	-3.52E-2
EP-T	mol N eq.	3.64E-3	4.34E-1	3.98E+0	4.41E+0	4.15E-2	3.33E-2	3.62E-2	0.00E+0	-3.80E-1
POCP	kg NMVOC eq.	5.88E-3	1.37E-1	2.16E+0	2.30E+0	1.23E-2	1.62E-2	1.09E-2	0.00E+0	-2.04E-1
ADP-mm	kg Sb-eq.	2.39E-6	7.88E-5	1.58E-3	1.66E-3	3.10E-7	1.37E-5	4.60E-7	0.00E+0	-3.79E-5
ADP-f	MJ	1.95E+4	2.58E+2	1.71E+4	3.69E+4	1.16E+1	5.51E+1	1.73E+1	0.00E+0	-1.15E+3
WDP	m3 world eq.	8.11E-2	1.16E+0	3.82E+1	3.94E+1	2.51E-2	3.34E-1	3.70E-2	0.00E+0	-4.60E+1

GWP-total=Global Warming Potential total (GWP-total) | **GWP-f**=Global Warming Potential fossil fuels (GWP-fossil) | **GWP-b**=Global Warming Potential biogenic (GWP-biogenic) | **GWP-luluc**=Global Warming Potential land use and land use change (GWP-luluc) | **ODP**=Depletion potential of the stratosperic ozon layer (ODP) | **AP**=Acidification potential, Accumulated Exceedance (AP) | **EP-fw**=Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater) | **EP-m**=Eutrophication potential, fraction of nutrients reaching marine end compartment (EP-marine) | **EP-T**=Eutrophication potential, Accumulated Exceedance (EP-terrestrial) | **POCP**=Formation potential of tropospheric ozone (POCP) | **ADP-mm**=Abiotic depletion potential for non fossil resources (ADP mm) | **ADP-f**=Abiotic depletion for fossil resources potential (ADP fossil) | **WDP**=Water (user) deprication potential, deprivation-weighted water consumption (WDP)

5 Results

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS EN 15804+A2

Abbr.	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
PM	disease incidence	1.74E-8	1.51E-6	1.62E-5	1.77E-5	2.29E-7	3.77E-7	3.15E-8	0.00E+0	-1.49E-6
IR	kBq U235 eq.	5.52E-3	1.06E-1	7.35E+0	7.46E+0	2.38E-3	3.05E-2	3.66E-3	0.00E+0	-6.55E-1
ETP-fw	CTUe	4.89E+0	1.53E+2	1.38E+3	1.54E+3	5.56E+0	3.10E+1	8.22E+0	0.00E+0	-1.26E+3
HTP-c	CTUh	1.49E-10	1.23E-8	1.16E-6	1.18E-6	2.72E-10	1.48E-9	4.05E-10	0.00E+0	-9.77E-9
HTP-nc	CTUh	4.06E-9	2.19E-7	4.56E-6	4.78E-6	1.89E-9	3.15E-8	2.72E-9	0.00E+0	-3.11E-7
SQP	Pt	1.83E+2	1.07E+2	1.19E+3	1.48E+3	7.83E-1	8.44E+1	1.16E+0	0.00E+0	-1.06E+3

PM=Potential incidence of disease due to PM emissions (PM) | **IR**=Potential Human exposure efficiency relative to U235 (IRP) | **ETP-fw**=Potential Comparative Toxic Unit for ecosystems (ETP-fw) | **HTP-c**=Potential Comparative Toxic Unit for humans (HTP-c) | **HTP-nc**=Potential Comparative Toxic Unit for humans (HTP-nc) | **SQP**=Potential soil quality idex (SQP)

CLASSIFICATION OF DISCLAIMERS TO THE DECLARATION OF CORE AND ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS

ILCD classification	Indicator	Disclaimer
ILCD type / level 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
ILCD type / level 2	Acidification potential, Accumulated Exceedance (AP)	None
	Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater)	None
	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
	Formation potential of tropospheric ozone (POCP)	None
	Potential Human exposure efficiency relative to U235 (IRP)	1
ILCD type / level 3	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	2
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2
	Potential Comparative Toxic Unit for humans (HTP-c)	2
	Potential Comparative Toxic Unit for humans (HTP-nc)	2

5 Results

ILCD classification	Indicator	Disclaimer
	Potential Soil quality index (SQP)	2

Disclaimer 1 – This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

5.2 INDICATORS DESCRIBING RESOURCE USE AND ENVIRONMENTAL INFORMATION BASED ON LIFE CYCLE INVENTORY (LCI)

PARAMETERS DESCRIBING RESOURCE USE

Abbr.	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
PERE	MJ	2.05E-1	4.21E+0	2.82E+2	2.86E+2	6.62E-2	6.45E+0	9.98E-2	0.00E+0	-1.27E+1
PERM	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	MJ	2.05E-1	4.21E+0	2.82E+2	2.86E+2	6.62E-2	6.45E+0	9.98E-2	0.00E+0	-1.27E+1
PENRE	MJ	1.95E+4	2.58E+2	1.71E+4	3.69E+4	1.16E+1	5.51E+1	1.73E+1	0.00E+0	-1.21E+3
PENRM	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRT	MJ	1.95E+4	2.58E+2	1.71E+4	3.69E+4	1.16E+1	5.51E+1	1.73E+1	0.00E+0	-1.21E+3
SM	Kg	0.00E+0	0.00E+0	1.54E+1	1.54E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	m^3	2.33E-3	3.71E-2	1.91E+0	1.95E+0	9.13E-4	1.09E-2	1.36E-3	0.00E+0	-1.29E+0

PERE=Use of renewable primary energy excluding renewable primary energy resources used as raw materials | **PERM**=Use of renewable primary energy resources used as raw materials | **PERT**=Total use of renewable primary energy resources | **PENRE**=Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials | **PENRM**=Use of non-renewable primary energy resources used as raw materials | **PENRT**=Total use of non-renewable primary energy resources | **SM**=Use of secondary material | **RSF**=Use of renewable secondary fuels | **NRSF**=Use of non-renewable secondary fuels | **FW**=Net use of fresh water

5 Results

OTHER ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES

Abbr.	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
HWD	Kg	6.24E-5	1.65E-3	5.21E-2	5.38E-2	7.83E-5	3.56E-4	1.16E-4	0.00E+0	-8.58E-4
NHWD	Kg	2.49E-2	8.06E+0	8.54E+1	9.35E+1	1.66E-2	6.06E+0	2.47E-2	0.00E+0	-2.12E+0
RWD	Kg	3.29E-6	6.13E-5	5.46E-3	5.53E-3	1.27E-6	2.03E-5	2.01E-6	0.00E+0	-3.72E-4

HWD=Hazardous waste disposed | **NHWD**=Non-hazardous waste disposed | **RWD**=Radioactive waste disposed

ENVIRONMENTAL INFORMATION DESCRIBING OUTPUT FLOWS

Abbr.	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
CRU	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	Kg	0.00E+0	0.00E+0	3.30E+2	3.30E+2	0.00E+0	3.16E-3	1.00E+3	0.00E+0	-1.00E+3
MER	Kg	0.00E+0	0.00E+0	6.49E-5	6.49E-5	0.00E+0	1.97E-4	0.00E+0	0.00E+0	0.00E+0
EET	MJ	0.00E+0	0.00E+0	1.77E-3	1.77E-3	0.00E+0	5.35E-3	0.00E+0	0.00E+0	0.00E+0
EEE	MJ	0.00E+0	0.00E+0	1.02E-3	1.02E-3	0.00E+0	3.10E-3	0.00E+0	0.00E+0	0.00E+0

CRU=Components for re-use | **MFR**=Materials for recycling | **MER**=Materials for energy recovery | **EET**=Exported Energy, Thermic | **EEE**=Exported Energy, Electric

5 Results

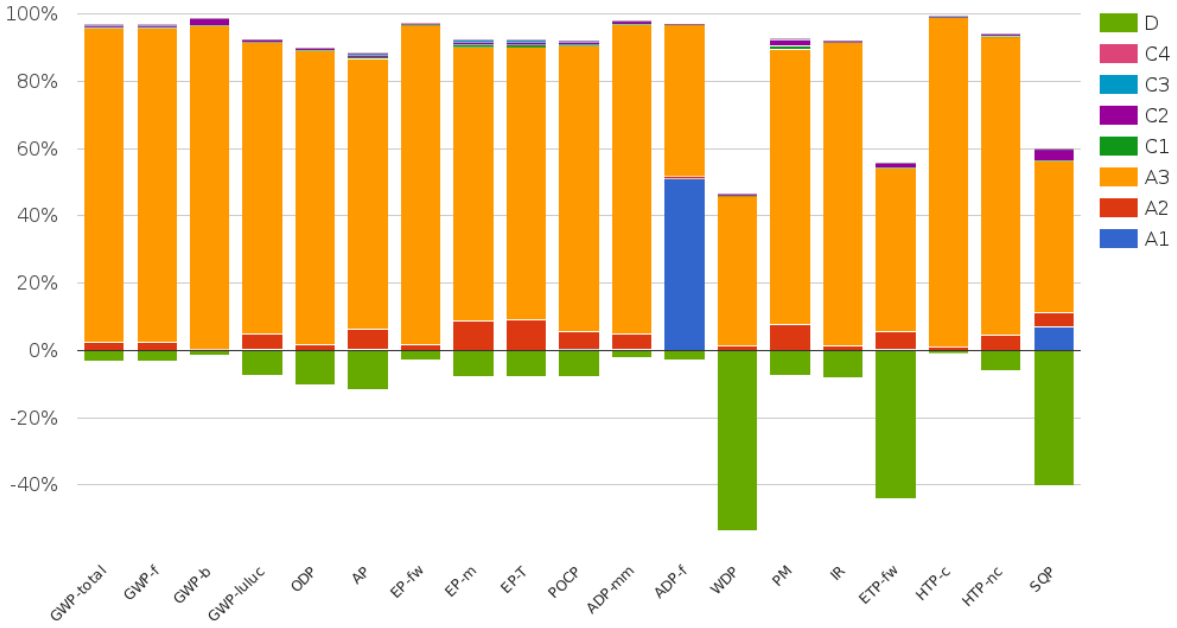
5.3 INFORMATION ON BIOGENIC CARBON CONTENT PER TON

BIOGENIC CARBON CONTENT

The following Information describes the biogenic carbon content in (the main parts of) the product at the factory gate per ton:

Biogenic carbon content	Amount	Unit
Biogenic carbon content in the product	0	kg C
Biogenic carbon content in accompanying packaging	0	kg C

6 Interpretation of results



The most significant contribution to the Global Warming potential (GWP-total) is the manufacturing stage (A1-A3) with a contribution of 96%.

In all of the other impact categories (A3) prove to be most impactful. Apart from GWP-total, (A3) is showing especially high impacts in Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater) with 95%, Potential Human exposure efficiency relative to U235 (IRP) with 90%, Formation potential of tropospheric ozone (POCP) with 84% and Acidification potential, Accumulated Exceedance (AP) with 80% of contribution. (D) is especially impactful in Water (user) deprication potential, deprivation-weighted water consumption (WDP) with 65%.

7 References

ISO 14040
ISO 14040:2006-10, Environmental management - Life cycle assessment - Principles and framework; EN ISO 14040:2006

ISO 14044
ISO 14044:2006-10, Environmental management - Life cycle assessment - Requirements and guidelines; EN ISO 14044:2006

ISO 14025
ISO 14025:2011-10, Environmental labels and declarations — Type III environmental declarations — Principles and procedures

EN 15804+A2
EN 15804:2012+A2:2019/AC:2021, Sustainability of Buildings - Environmental Product Declarations - Framework Development Rules by Product Category

Kiwa-EE GPI R.3.0 (2025)
Kiwa-Ecobility Experts, General Programme Instructions “Product Level”, SOP EE 1201_R.3.0 (03.06.2025)

Kiwa-EE GPI R.3.0 Annex B1 (2025)
Kiwa-Ecobility Experts, General Programme Instructions “Product Level” – Annex B1 Environmental Information Programmeaccording to EN 15804 / ISO 21930 , SOP EE 1203_R. 3.0 (03.06.2025)

Ecoinvent
ecoinvent Version 3.9.1 (December 2022)

R<THINK characterization method
ecoinvent 3.9.1: EN 15804+A2 indicators (EF 3.1)

NMD PCR Asphalt V2.0
Product Category Rules voor bitumineuze materialen in verkeersdragers en waterwerken in Nederland ("PCR Asfalt") versie 2.0

Trinidad and Tobago - Countries & Regions - IEA - Electricity
https://www.iea.org/countries/trinidad-and-tobago/electricity

8 Contact information

Publisher	Operator	Owner of declaration

Kiwa-Ecobility Experts
Wattstraße 11-13
13355 Berlin, DE

E-mail:
DE.Ecobility.Experts@kiwa.com
Website:
https://www.kiwa.com/de/en/themes/ecobility-experts/ecobility-experts-epd-program/

Kiwa-Ecobility Experts
Wattstraße 11-13
13355 Berlin, DE

E-mail:
DE.Ecobility.Experts@kiwa.com
Website:
https://www.kiwa.com/de/en/themes/ecobility-experts/ecobility-experts-epd-program/

Lake Asphalt of Trinidad and Tobago (1978) Limited
Brighton
630509 La Brea, Trinidad & Tobago, TT

E-mail:
sramlal@trinidadlakeasphalt.com
Website:
https://trinidadlakeasphalt.com/

Kiwa-Ecobility Experts is established member of the ECO PLATFORM