AfPA National Sustainability Committee
Sustainability Framework for Pavements - Asphalt Plant

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Plant Management & Reporting Systems [13]

Pla-M1 – Product Composition [3]

Level 1. Criteria [1] The plant has measurement systems in place to report (average) asphalt product compositions (mix design) per annum
Level 2. Criteria [3] The plant has measurement systems in place to report (average) asphalt product compositions (mix design) per client / job (road project)

Evidence Required
Level 1: Report outlining the average annual asphalt composition - signed off by plant manager or equivalent.
Level 2: At least three real examples of reporting to clients, outlining the (average) asphalt composition per client / job (road project) - signed off by plant manager or equivalent.

Pla-M2 – Maintenance & QC [2]

Level 1. Criteria [1] The plant has a working plant calibration and maintenance procedure in place
Level 2. Criteria [2] Effective quality control (QC) processes in the production and processing of aggregates, binders, fillers and additives, recycled materials and asphalt mixes are in place

Evidence Required
Level 1: Evidenced by existence of procedure at plant/corporate level and identification of person/position responsible for implementation at plant level.
Level 2: Evidenced by a Quality Management Plan (ISO 9001 accredited) - whether explicit or part of a Production Management Plan - with dedicated sections on quality control processes and procedures.

Pla-M3 – Green House Gas intensity [3]

Level 1. Criteria [1] Average annual GHG intensity of asphalt plant production only (scope 1+2) is reported for the plant (kg CO2e/tonne)
Level 2. Criteria [2] Average monthly GHG intensity of asphalt plant production only (scope 1+2) is reported for the plant (kg CO2e/tonne)
Level 3. Criteria [3] Average annual GHG intensity of asphalt plant production only (scope 1+2) is publicly available for the plant (kg CO2e/tonne)

Evidence Required
The data should be supplied, either through readily available information (e.g., website, annual report, sustainability report) or a specific report for purposes of assessment as part of this framework (e.g., supply of electricity invoicing). This includes a clear statement for which plant the data are valid. The data reporting method should align with NGER reporting (National Greenhouse and Energy Reporting) or an AfPA approved reporting protocol and should indicate whether a location-based or market-based approach to electricity emissions reporting has been used.

Notes: For clarity, Scope 1 and 2 reporting does not include raw material inputs e.g., Aggregates, RAP, bitumen
The sector is seeing a move from "location-based" reporting to "market-based" reporting, which yield different results if the plant is run on purchased renewable electricity. For more information, refer to:
https://www.climateactive.org.au/sites/default/files/2021-04/Climate%20Active%20Electricity%20Accounting.pdf

Pla-M4 – Carbon Footprint [2]

Level 1. Criteria [1] Use of the AfPA LCA Calculator for mix-specific cradle-to-gate carbon footprint of asphalt mixtures (scope 1, 2 and 3) are reported for the plant (kg CO2e/tonne)

Level 2. Criteria [2] Use of EPD Based data for mix-specific cradle-to-gate carbon footprint of asphalt mixtures (scope 1, 2 and 3) are reported for the plant (kg CO2e/tonne)

Evidence Required

The scope 3 emissions of the carbon footprint include embodied emissions of raw materials as well as transport of raw materials to the plant. The AfPA's available regional appendix to the Product Category Rules for asphalt mixtures provide more guidance on scope and methodology:

- *https://epd-australasia.com/wp-content/uploads/2019/02/FINAL-AEPD-AAPA-PCR-Appendix-Asphalt-mixtures-20190122.pdf*
- *https://epd-australasia.com/wp-content/uploads/2022/04/EPDA-AfPA-Technical-Guidance-document-final-for-publication-20220427.pdf*

Pla-M5 – Energy Usage [3]

Level 1. Criteria [1] Average annual energy use of asphalt production (scope 1) is reported for the plant (MJ/tonne)

Level 2. Criteria [2] Average monthly energy use of asphalt production (scope 1) is reported for the plant (MJ/tonne)

Level 3. Criteria [3] Average monthly energy use of asphalt production (scope 1 in MJ/tonne) and plant electricity use (scope 2 in kWh/tonne) is reported for the plant

Evidence Required

The data should be supplied, either through readily available information (e.g., website, annual report, sustainability report) or a specific report for purposes of assessment as part of this framework (e.g., supply of electricity invoicing). This includes a clear statement for which plant the data are valid. The data reporting method should align with NGER reporting (National Greenhouse and Energy Reporting) or an AfPA approved reporting protocol.

Binders [7]

Pla-B1 – Virgin Binder Replacement [4]

Level 1. Criteria	[1] The average virgin binder replacement using RAP across the plant's production exceeds 5% (over the last 12-month reporting period)
Level 2. Criteria	[2] The average virgin binder replacement using RAP across the plant's production exceeds 10% (over the last 12-month reporting period)
Level 3. Criteria	[4] The average virgin binder replacement using RAP across the plant's production exceeds 20% (over the last 12-month reporting period)

Evidence Required
This indicator is measured by the amount of virgin bitumen binder that is replaced by binder in RAP. The default virgin binder content is 5.5% in asphalt. This means, if the asphalt products over the last 12-month period contained 5% virgin binder, the replacement percentage is calculated as 100%-(5/5.5) = 9.1%
Virgin bitumen binder replacement can be achieved through the use of RAP.
Evidenced by production report, signed off by plant manager or equivalent.

Pla-B2 – Alternative Binders [3]

Level 1. Criteria	[1] The plant provides a product with a non-fossil fuel binder (other than RAP) that replaces virgin bitumen. Replaced virgin binder content across the plant's production exceeds 1% (over the last 12-month reporting period)
Level 2. Criteria	[2] The plant provides a product with a non-fossil fuel binder (other than RAP) that replaces virgin bitumen. Replaced virgin binder content across the plant's production exceeds 2% (over the last 12-month reporting period)
Level 3. Criteria	[3] The plant provides a product with a non-fossil fuel binder (other than RAP) that replaces virgin bitumen. Replaced virgin binder content across the plant's production exceeds 5% (over the last 12-month reporting period)

Evidence Required
The percentage replacement is calculated as [(mass of non-fossil fuel binder excl. RAP) / (mass of total binder quantity, incl. RAP)]
Evidenced by site mass balance (and underlying data such as delivery dockets for alternative and virgin binder), signed off by plant manager or equivalent.
Non-fossil fuel binders need to not rival any human food material.
Example of non-fossil fuel binders include: Asphalt binder, binder extender or rejuvenator that is not bituminous, e.g. tyre derived rubber, waste toner, waste plastic, bio-oil, recycled oil, etc.

Aggregates, Fillers and Additives [9]

Pla-A1 – Moisture [3]

Level 1. Criteria [1] The moisture content of aggregates going into the asphalt production process is actively measured
Level 2. Criteria [2] The plant has covered bins that contain sand, dust, and RAP against water ingress
Level 3. Criteria [3] The plant has covered all aggregate bins against water ingress and all bins on site are equipped with adequate drainage facilities

Evidence Required
Level 1: Proof of daily reporting process for moisture content measurement reports, signed off by plant manager or equivalent.
Level 2: Evidence of level 1 and photographic evidence that sand, dust and RAP are covered
Level 3: Evidence of level 2 and photographic evidence and/or site plans showing all aggregate bins and drainage.

Pla-A2 – Recycled Aggregate [3]

Level 1. Criteria [1] The average recycled aggregate content across the plant's production exceeds 15% (over the last 12-month reporting period)
Level 2. Criteria [2] The average recycled aggregate content across the plant's production exceeds 20% (over the last 12-month reporting period)
Level 3. Criteria [3] The average recycled aggregate content across the plant's production exceeds 25% (over the last 12-month reporting period

Evidence Required
This indicator is measured by the amount of recycled aggregates that is used in production. The percentage is calculated by dividing the amount of recycled aggregates (e.g. crushed glass) by the total amount of aggregates used in production (virgin plus recycled) over the last 12-month period.
Evidenced by production report, signed off by plant manager or equivalent.
Definition: Recycled aggregates are materials (used to replace aggregate) that have not come directly from a traditional quarrying process.
The following are classified as recycled aggregates: Reclaimed Asphalt Pavement (RAP), Recycled Crushed Glass, Used Foundry Sand or Spent Foundry Sand, Recycled Concrete Aggregate (RCA), Recycled Concrete and Masonry (RCM), Reclaimed Aggregate (RA). The following reused by-products may also be counted towards recycled aggregates: Blast Furnace Steel Slag (BFSS), Granulated Blast Furnace Slag (GBS), Electric Arc Furnace Slag (EAFS), Steel Furnace Slag (SFS), Furnace Bottom Ash (FBA), Incinerator Bottom Ash (IBA), Coal Washery Reject (CWR)

Pla-A3 – Recycled Filler [3]

Level 1. Criteria [1] The average recycled filler content across the plant's production exceeds 5% (over the last 12-month reporting period)
Level 2. Criteria [2] The average recycled filler content across the plant's production exceeds 7.5% (over the last 12-month reporting period)
Level 3. Criteria [3] The average recycled filler content across the plant's production exceeds 10% (over the last 12-month reporting period))

Evidence Required
This indicator is measured by the amount of recycled fillers used in production. The percentage is calculated by dividing the amount of recycled fillers (e.g. fly ash) by the total amount of fillers used in production (virgin plus recycled) over the last 12-month period.
Evidenced by production report, signed off by plant manager or equivalent.
Definition: Recycled fillers are materials used as a filler that come as a by-product from another industry/process or from recycled materials.
The following are classified as recycled fillers: Fly Ash (FA), Crusher Fines (ultra-fine i.e., less than 400micron)
Not classified as recycled fillers: Baghouse dust

Energy [24]

Pla-E1 – Energy Audit [3]

Level 1. Criteria [1] An energy audit has been undertaken by internal staff within the last five years. The audit should be informed by "AS/NZS 3598.2:2014 Energy Audits—Industrial and related activities". A report of the energy audit is available

Level 2. Criteria [2] A Type 1 energy audit of the plant (AS/NZS 3598.2:2014 Energy Audits—Industrial and related activities) has been undertaken within the last five years. The audit may be completed by internal resources. The audit report must be compliant with the standard

Level 3. Criteria [3] A Type 2 energy audit of the plant (AS/NZS 3598.2:2014 Energy Audits—Industrial and related activities) has been undertaken by an external third-party audit within the last five years. The audit report must be compliant with the standard

Evidence Required

Evidenced by the signed audit report.

Pla-E2 – Implemented Energy Efficiency [3]

(For plants that are <2 years old, this criterion is automatically assigned Level 2 until such time that a comparison can be undertaken.)

Level 1. Criteria [1] Implementation of energy efficiency opportunities has resulted in continuous improvement in plant energy (fuel) consumption. An average 1% annual reduction since the base year has been achieved

Level 2. Criteria [2] Implementation of energy efficiency opportunities has resulted in continuous improvement in plant energy (fuel) consumption. An average 2% annual reduction since the base year has been achieved

Level 3. Criteria [3] Implementation of energy efficiency opportunities has resulted in continuous improvement in plant energy (fuel) consumption. An average 3% annual reduction since the base year has been achieved

Evidence Required

Evidenced by an energy use report (covering all directly combusted fuels) for the plant, detailing the energy use during the base year and every subsequent year until the reporting period. The report should include an overview of energy efficiency measures taken, including the date/period of implementation and a quantification of the expected/achieved energy reduction.

The energy efficiency (in MJ/t) is calculated as total energy use (fuel and electricity in MJ) divided by the total production mass (in tonnes). Note: electricity sourced from the grid should be converted to primary energy (1 kWh = 9 MJ) before the energy is added to fuels. (This accounts for the energy conversion factor (3.6 MJ/kWh) as well as the assumed efficiency of power plants (40%)).

The base year is defined as the year prior to the point when the plant first participated in the SF4A. In areas where energy use during the base year and/or reporting periods are significantly influenced by high levels of rainfall, a multi-year average may be required to account for the impact of particular wet years.

Pla-E3 – Site Renewable Energy [4]

(For plants located in a State or Territory where 100% renewable electricity is available (i.e., ACT), Level 3 is automatically assigned)

Level 1. Criteria [1] The site (plant + office) sources >25% of annual electricity consumption directly from renewable energy sources

Level 2. Criteria [2] The site (plant + office) sources >50% of annual electricity consumption directly from renewable energy sources

Level 3. Criteria [4] The site (plant + office) sources >90% of annual electricity consumption directly from renewable energy sources

Evidence Required

Level 1, 2 and 3: Evidenced by the following:

a) on-site solar and wind: a metered contribution of on-site generation to the plant's total electricity use. If the on-site renewable electricity source is not metered, electricity bills for a 12-month period since instalment of renewables can be compared against electricity bills for a 12 month period prior to instalment of renewables.

b) contractual arrangements when purchasing off-site renewable energy (e.g. through Power Purchasing Agreements (PPA's), retirement of Large Generation Certificates (LGCs), GreenPower). Only electricity that is explicitly contracted by the company as renewable electricity counts towards the target. The renewable component of the electricity grid (hydro in Tasmania, wind in South Australia, etc.) does not count towards the target.

Pla-E4 – Waste Derived Fuel [4]

Level 1. Criteria [1] A fuel derived from waste, which does not exceed the stack emission (relative to coal or petroleum-based fuel use), is used as a substitution of >10% of the site's stationary energy consumption

Level 2. Criteria [2] A fuel derived from waste, which does not exceed the stack emission (relative to coal or petroleum-based plant fuel use), is used as a substitution of >50% of the site's stationary energy consumption

Level 3. Criteria [4] A fuel derived from waste, which does not exceed the stack emission (relative to coal or petroleum-based plant fuel use), is used as a substitution of >80% of the site's stationary energy consumption

Evidence Required

Any secondary fuel can qualify as fuel derived from waste, provided it is sourced locally. A material is defined as a waste if it meets one of the following conditions:

- The material is a post-consumer collected material with limited recycling or reuse options

Evidenced by a comparison report relative to other available alternative fuels, prepared or reviewed by a qualified person (in LCA or GHG accounting); plus evidence of % contribution to total stationary energy sources (scope 1 direct combusted stationary fuels)

Pla-E5 – Climate Active Certification – Carbon Neutrality [4]

Level 1. Criteria [1] The plant has one or more Climate Active certified carbon neutral products available. This can be achieved through an "opt-in system", where customers can opt to order a carbon neutral version of a product or through providing a carbon neutral product range

Level 2. Criteria [2] The plant has supplied Climate Active certified carbon neutral products to clients, covering more than 30% of its previous annual production volume

Level 3. Criteria [4] The plant has supplied Climate Active carbon neutral products to clients for 100% of its previous annual production volume

Evidence Required

Climate Active certification is evidenced by the availability of a Public Disclosure Statement on the Climate Active website (https://www.climateactive.org.au/) that identifies the plant and products covered by the certification.

The Climate Active program sets requirements regarding every aspect of carbon neutrality: the carbon accounting methodology, types of approved offsets, reporting requirements and verification. Environmental Product Declarations (EPDs) published through EPD Australasia can simplify Climate Active certification, as they cover the carbon footprint calculation and independent verification aspects of carbon neutral certification.

Note: To achieve Level 2, the verifier will compare the volume of carbon neutral products sold (as stated in the Climate Active PDS) against the annual production volume (in tonnes) as reported in Pla-M5 – Energy Usage.

Pla-E6 – Warm Mix Asphalt [3]

Level 1. Criteria [1] More than 5% of the plant's most recent annual production consisted of warm mix asphalt (WMA) products

Level 2. Criteria [2] More than 10% of the plant's most recent annual production consisted of warm mix asphalt (WMA) products

Level 3. Criteria [3] More than 30% of the plant's most recent annual production consisted of warm mix asphalt (WMA) products

Evidence Required

Registered mix designs (where applicable) must be confirmed through mix design certificates (e.g., a certificate issued by the Department of Transport and Main Roads (Queensland or other State Road Authority) to a manufacturer confirming that the manufacturer has a registered mix design. It may be either a laboratory verified certificate, or a production verified certificate.)

All levels: The temperature requirement for WMA is a function of the mix type and binder used:

- *< 165^{o}C for crumb rubber modified binder asphalt*
- *< 160^{o}C for Polymer Modified Binder (PMB) asphalt and EME2 high modulus asphalt;*
- *< 150^{o}C for unmodified asphalt*

The temperature is measured at the plant when the product is loaded onto the truck (i.e., when laboratory sample is taken in the truck/tipper).

Level 2 and 3: Production records over the last reporting year (i.e., financial year or calendar year). Percentage WMA is calculated based on tonnages produced or sold. Evidenced by production report, signed off by plant manager or equivalent.

Pla-E7 – Burner Energy Used [3]

Level 1. Criteria [1] Average total annual burner fuel emissions of the asphalt plant is less than 23 kgCO2e/tonne (see note)
Level 2. Criteria [2] Average total annual burner fuel emissions of the asphalt plant is less than 21 kgCO2e /tonne (see note)
Level 3. Criteria [3] Average total annual burner fuel emissions of the asphalt plant is less than 19 kgCO2e/tonne (see note)

Note: for diesel this is (L1 = 325 MJ/tonne, L2 = 300 MJ/tonne and L3 = 275 MJ/tonne) and for other fuels, see:
https://www.dcceew.gov.au/sites/default/files/documents/national-greenhouse-accounts-factors-2021.pdf

Evidence Required
The intensity is calculated by dividing the amount of burner fuel energy used by the asphalt plant by the total amount of asphalt produced over the last 12-month period. Total annual burner fuel energy use is the sum of all burner fuel required by the plant to dry aggregates (i.e., natural gas, LPG, fuel oil, diesel, biofuels, etc.).

Product Performance [3]

Pla-P1 – Plant and Product Performance [3]

Level 1. Criteria	[1] The plant must demonstrate that it can consistently deliver products in accordance with mix designs. The plant performance is monitored through: A) Production testing being undertaken
Level 2. Criteria	[2] The plant must demonstrate that it can consistently deliver products in accordance with mix designs. The plant performance is considered through: A) Statistical process control charts representing annual asphalt output covering binder content, gradation, air voids etc.
Level 3. Criteria	[3] The plant must demonstrate that it can consistently deliver products in accordance with mix designs. The plant performance is considered through: B) Using SPC and introducing production tolerance levels and feedback control systems to demonstrated convergence to production tolerances

Evidence Required

Level 1: Summary of production test results as per NATA requirements.

Levels 2: Statistical Process Control charts provided.

Level 3: Statistical Process Control charts provided and improved performance relative to previous FY.

Innovation [3]

Pla-In1 – Outstanding Sustainable Performance [3]

Criteria: Based on Innovation Credit Scoring: Innovations that demonstrate best practice in areas of sustainability can achieve additional points. Innovations may capture sustainability initiatives at plant level in areas not covered by the SF4A, or they may showcase outstanding performance well beyond the level 3 criteria requirements. Innovative initiatives that improve the sustainability of the asphalt value chain may also be rewarded.

Evidence Required
The innovation relates to processes, plants or products that are new to Australia (i.e., not done by anyone else already in Australia, patent award, exclusive licence etc.)
The innovation credit is to be limited to 3 years and applicable to the company(s) (i.e., for joint ventures) for each site where this is implemented (i.e., it is a maximum of 3 years from when the innovation is first registered/approved in this scheme, regardless of when it is implemented on a specific site).
The innovation credit is only applicable where it can be clearly demonstrated that the innovation is novel.
The innovation credit is only applicable when it can be demonstrated to provide at least one the following:

- *a net positive CO_2 reduction of at least 5% or*
- *an increase in the use of circular materials by at least 5% without CO_2 increase or*
- *demonstrates an ability to increase the life of the product by 30%*

Benefits need to be demonstrated that they are permanent/utilised at that plant and results in the stated achievements relative to existing technology.
The innovation credit is limited to be applied only once to the site/plant for the duration of the innovation's validity.

Scoring for Additional Asphalt Plant Capability

The addition of "Asphalt Plant Capability" is included in the Forms-based input for the toolkit.
For Capability Assessment, evidence is based on proof of current requirements for Levels 1 to 3.
When claiming points above Level 3, proof is required as per specified evidence requirements related to Virgin Binder Replacement and Alternative Binders.

Note: This assessment is not limited by client specifications or standards but reflects the delivery capability of the plant and its operations.
Maximum additional capacity rating +6 points - achieve six STAR rating system

Pla-B1 Virgin Binder Replacement

ADDITIONAL Capability Points

Level 1 able to achieve Level 2 = + 1 point
Level 2 able to achieve Level 3 = + 2 point
Level 3 able to achieve Level 4 = Capability greater than 40% RAP = + 3 point

Can only claim 1 level above that which can be presently demonstrated.

Evidence Required:

Undertake a trial to demonstrate that the plant has produced and placed a mix at this higher RAP level and supply supporting evidence, such as a field air voids report (i.e., information related to ATO R&D rebates). The plant also needs to provide evidence of a registered and current mix with the relevant state road agency at this higher RAP level (i.e., supply of the registration certificate)

Pla-B2 Alternative Binders

ADDITIONAL Capability Points

Level 1 able to achieve Level 2 = + 1 point
Level 2 able to achieve Level 3 = +2 point
Level 3 able to achieve Level 4 = Capability greater than 10% alternative binder usage = + 3 point

Can only claim 1 level above that which can be presently demonstrated.

Evidence Required:

The plant has produced a mix using alternative binders at this higher level and is able to supply appropriate supporting lab performance testing evidence. The plant needs to provide evidence of an accepted mix design by a relevant and suitably qualified authority at this higher alternative binder level (i.e., supply of the relevant information meeting the local authorities' specification requirements).

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