What is Ecologiq and why does Victoria need it?

Ecologiq is a Victorian Government initiative to increase use of recycled and reused materials in Victorian Big Build transport infrastructure projects.

Ecologiq is supporting the implementation of the Recycled First Policy, which applies to major transport infrastructure projects from March 2020 and DoT operational and maintenance projects from January 2022.

Bidders on major transport projects are required to demonstrate how they will optimise use of recycled and reused Victorian materials through the tender and contracting process.

Recycled First applies to recycled and reused material allowable limits under existing specifications, but also makes provision for the inclusion of innovative sustainable initiatives and materials.

These principles can be easily applied to local government infrastructure, with Ecologiq working closely with industry to ensure the policy’s implementation is widely understood and adopted where possible.
<table>
<thead>
<tr>
<th>Material Application</th>
<th>Material Type / Product</th>
<th>Recycled or Reused Material</th>
<th>Product Name (if known)</th>
<th>% Allowable Recycled &amp; Reused Material Limits</th>
<th>Total Tonnage of Recycled First Commitment - Quantity</th>
<th>Unit</th>
<th>% of Recycled First Commitment - Recycled or Reused Content</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Landscaping &amp; Rehabilitation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Timber</td>
<td>Site Won Material</td>
<td>N/A</td>
<td></td>
<td>100%</td>
<td>TBC</td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>Topsoil/Soil</td>
<td>Site Won Material</td>
<td>N/A</td>
<td>Recycled Topsoil</td>
<td>100%</td>
<td>TBC</td>
<td></td>
<td>100%</td>
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<tr>
<td>Mulch</td>
<td>Mulched Timber / Recycled Mulch</td>
<td></td>
<td></td>
<td>100%</td>
<td>TBC</td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>Geotextiles</td>
<td>Plastic</td>
<td>Bidim Green</td>
<td></td>
<td>100%</td>
<td>371.97</td>
<td>m2</td>
<td>100%</td>
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<tr>
<td><strong>Drainage</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Crushed Rock – Class Crushed Concrete 3</td>
<td>VR 20mm Class 3 Crushed Concrete</td>
<td></td>
<td></td>
<td>100%</td>
<td></td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>Drainage Pipes</td>
<td>Fly Ash</td>
<td>Reinforced Concrete Pipe</td>
<td>25%</td>
<td></td>
<td></td>
<td></td>
<td>0%</td>
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<tr>
<td><strong>Retaining Walls and Other Bridge Components</strong></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concrete – Structural</td>
<td>Fly Ash</td>
<td>VS402FVRT</td>
<td>Per Specs</td>
<td>169,200</td>
<td></td>
<td>kg</td>
<td>25%</td>
</tr>
<tr>
<td>Concrete – Structural</td>
<td>Slag</td>
<td>VS402FVRT</td>
<td>Per Specs</td>
<td>203,040</td>
<td></td>
<td>kg</td>
<td>30%</td>
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<tr>
<td><strong>SUP, Footpaths, Edgings</strong></td>
<td></td>
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<tr>
<td>Concrete – Paving</td>
<td>Fly Ash</td>
<td>VS322FVR</td>
<td>Per Specs</td>
<td>96,900</td>
<td></td>
<td>kg</td>
<td>24%</td>
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<tr>
<td>Concrete – Paving</td>
<td>Plastic</td>
<td>Emesh</td>
<td>Per Specs</td>
<td>4,560</td>
<td></td>
<td>kg</td>
<td>1%</td>
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<td><strong>Pavements</strong></td>
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<td></td>
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<td></td>
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<td>Type A Capping Layer Crushed Concrete 4</td>
<td>VR 20mm Class 4 Crushed Concrete</td>
<td></td>
<td></td>
<td>100%</td>
<td>2190</td>
<td>m3</td>
<td>100%</td>
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<tr>
<td>Crushed Rock – Class Crushed Concrete 3</td>
<td>VR 20mm Class 3 Crushed Concrete</td>
<td></td>
<td></td>
<td>100%</td>
<td>2976.6</td>
<td>m3</td>
<td>100%</td>
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<tr>
<td>Asphalt – Type SI</td>
<td>Asphalt 20SI</td>
<td>30%</td>
<td></td>
<td></td>
<td>790</td>
<td>T</td>
<td>20%</td>
</tr>
<tr>
<td>Asphalt – Type SS</td>
<td>Glass Fines</td>
<td>100%</td>
<td></td>
<td></td>
<td>TBC</td>
<td>T</td>
<td></td>
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<tr>
<td>Asphalt – Type H</td>
<td>Asphalt 14H</td>
<td>20%</td>
<td></td>
<td></td>
<td>350</td>
<td>T</td>
<td>20%</td>
</tr>
</tbody>
</table>
## Priority waste materials

<table>
<thead>
<tr>
<th>Material</th>
<th>Description</th>
<th>Usage option</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Plastic</strong></td>
<td>Commercial, industrial and municipal waste</td>
<td>• Binder modifier&lt;br&gt;• Asphalt&lt;br&gt;• Noise walls&lt;br&gt;• Bollards and wheel stops&lt;br&gt;• Drainage&lt;br&gt;• Bike paths, decking, boardwalks&lt;br&gt;• Roadside furniture, bins, drinking fountains, signage and art&lt;br&gt;• Composite sleepers</td>
</tr>
<tr>
<td><strong>Organics</strong></td>
<td>Commercial and domestic food waste, green waste from landscaping and maintenance and biosolids</td>
<td>• Compost, including landscape planting, wetlands creation, turf and vegetation establishment and erosion control&lt;br&gt;• Soil conditioners&lt;br&gt;• Mulch&lt;br&gt;• Geotechnical fill</td>
</tr>
<tr>
<td><strong>Crumb rubber</strong></td>
<td>Ground end-of-life tyres, typically truck tyres, though sources may include passenger tyres, off-road mining tyres or conveyor belts</td>
<td>• Spray sealing&lt;br&gt;• Binder modifier&lt;br&gt;• Some asphalt mixes&lt;br&gt;• Pavement markings (e.g. surface treatments)&lt;br&gt;• Miscellaneous roadside applications (e.g. speed humps)</td>
</tr>
</tbody>
</table>
Innovation in plastics

- Various asphalt suppliers and representatives from the recycling and plastics industries are conducting research and development of asphalt mixes which incorporate soft plastics.

- Industry is working to better understand plastic modified asphalt production, performance, durability, and sustainability and environmental outcomes.

- The Australian Road Research Board (ARRB) and Australian flexible Pavement Association (AfPA) are developing a specification for recycled polymers under the Victorian DoT 407 specification.

- We anticipate these efforts will help divert waste from landfill, reduce the use of virgin materials and provide economic stimulation to recycled content suppliers in Victoria.

- Products incorporating recycled plastic such as underground service pits, railway sleepers and noise walls are currently being produced and used in trials.
Several asphalt products incorporating recycled plastics already exist. Approximately 400 tonnes of an asphalt additive made with soft plastics and toner powder was used in the 2019-20 financial year across Australia. This represents more than 50,000 tonnes of asphalt that has plastic as an additive in it.

95 per cent of this was in council roads across Australia, and five per cent in state road trials.

This includes a 2019 trial by Port Phillip Council, where 800 kilograms of recycled plastic was used to resurface a suburban St Kilda street.

These figures represent a small amount of the potential market for recycled plastic in asphalt across Australian roads, which is approximately 75,000 tonnes of plastic a year.
Soft plastic and toner in asphalt

- In Melbourne’s west, workers used more than 590,000 plastic bags and toner from 13,000 print cartridges to resurface a road.

- The product was trialled on Duncans Road, Werribee as part of the $1.8 billion Western Roads Upgrade.

- Around 155 tonnes of the material was used in the wearing course layer, marking one of the first times the product has been used on a Victorian arterial road.

- The pavement was placed next to a standard wearing course asphalt to be compared and monitored over the next few years.

- The Western Roads Upgrade has already used mammoth volumes of widely accepted recycled materials, including more than 190 million recycled glass bottles and up to 300,000 tonnes of recycled asphalt.
Recycled plastic noise walls

• In a world first, plastic noise walls comprising 75% recycled materials are being installed along the Mordialloc Freeway

• Approximately 570 metric tonnes of plastic waste will be converted into 32,000 square metres of noise walls

• Around half of that consists of soft plastics known as film, while the other half is made from household plastic waste such as soft drink and milk bottles

• That’s the equivalent of the recycled plastic waste collected from 25,000 Victorian homes in a year

• This trial is being supported by Sustainability Victoria’s Market Development Grant Program, which supports the validation of the product and will help us develop standards and specifications for recycled content noise wall applications.
Crumb rubber in sprayed seal

- Crumbed rubber in spray seals is widely used to build roads in country Australia and overseas.
- The Department of Transport is a national leader in using crumb rubber modified binders for sprayed sealing.
- Crumb rubber can be added to the binder of sprayed seals to:
  - Improve flexibility and cracking resistance
  - Improve aggregate adhesion
  - Reduce risk of bleeding/flushing
- Typically, crumb rubber seals are used for High-Strength Seals (HSS), Strain Alleviating Membrane (SAM) and Strain Alleviating Membrane Interlayer (SAMI).
Ancillary infrastructure reference guide (plastic)

- The Recycled Materials in Ancillary Infrastructure Reference Guide outlines applications including site clearance, roadside, urban design and landscaping, organics and rail/tram platform ancillary elements.

- Many of the ancillary applications are not considered safety and/or service critical assets and therefore once compliant with relevant standards are not subject to additional assurance procedures.

- This provides a fantastic opportunity to innovate and utilise emerging reused and recycled materials such as plastic.

### Plastic
- Commercial, industrial and municipal waste
- Sorted into plastic types/categories
- Shredded and granulated
- Cleaned/washed
- Dried, decontaminated and pelletised
- Reprocessed/reformed into recycled products
- Barrier end treatments and bollards
- Roadside furniture (e.g. pavement markings, wheel stops)
- Urban design and landscaping (e.g. fencing, signs, boardwalks and decking)
The Reference Guide for Recycled Materials in Rail Infrastructure provides a summary of current industry standards, specifications and documents from Rail Transport Operators (RTOs) in Victoria, the Department of Transport and Australian standards that support the use of recycled materials in rail infrastructure.

Plastic is noted as an emerging material, but there are numerous potential applications detailed which contractors are encouraged to explore as part of Recycled First. See the guide for full details.
Recycling Victoria and our circular economy

Ecologiq and Recycled First ultimately support the Recycling Victoria Strategy which outlines our state’s 10-year plan for a circular economy. The construction industry has the scale and the resources to create significant change in the way we approach reused and recycled materials.

**Goal 1:** Design to last, repair and recycle.

**Goal 2:** Use products to create more value.

**Goal 3:** Recycle more resources.

**Goal 4:** Reduce harm from waste and pollution.
We’re part of the solution…

• By adhering to Recycled First principles and seeking innovations, we can create a significant market for reused and recycled materials and enhance Victoria’s sustainability.

How can Ecologiq support you?

• We want to support your innovations, connect you to opportunities and help you build relationships to support sustainable project outcomes.

• For contractors: Contact us for support embedding sustainable products, materials and initiatives in your projects.

• For suppliers: Contact us for assistance in connecting to opportunities and achieving compliance to standards and specifications.

• For industry: Contact us to collaborate and share expertise.

If you have questions following today’s presentation, please email: ecologiq@roadprojects.vic.gov.au.