Data Quality, Confidence and Benchmark Reliability	
Audience questions • How reliable are CAPEX costs when owners may under-report costs or costs fluctuate during delivery? • Does the methodology account for inflation and cost escalation? • How is the intensity ratio calibrated against cost escalation over time? • How many projects were included in the modelling? • What would be needed to move confidence levels from medium to high? • Are smaller projects underrepresented in the dataset? • Has consideration been given to incorporating local government or IPWEA datasets? • Is there evidence of cost and carbon emissions becoming decoupled in newer projects?	CAPEX was adjusted by the Australian or New Zealand consumer price index from the year of completion, we chose the final project costs reported by the contractor or if this was unavailable the final cost reported by the proponent rather than the bid price as we know during construction there are inevitably variables to program, scope and budget. This methodology ensured we had the most accurate cost data and that the cost was adjusted for macro-economic variables. Over 110 projects were included in the modelling, though not all were included in the final output after sensitivity testing. To move to a higher confidence in the benchmark and its outputs, we would need more data to strength the correlation findings between cost and carbon. It is expected this will occur with updates over time. Smaller projects are a large proportion of the data, and are represented across all asset subtypes, but particular asset subtypes such as road sat grade have a higher representation. Note that users are notified when inputs exceed data set CAPEX boundaries. We have cast the net wide but currently only include state government projects, as the benchmark progresses local government could be included but it would depend on the asset subtype classification methodology and inclusion. There has been no observation of newer projects showing a decoupling of cost and carbon.
Carbon Data Sources and Benchmark Methodology	
Audience questions: • Was the embodied carbon dataset based on verified IS Materials Calculator outputs? • How will future updates to materials calculators be accommodated? • Is benchmarking based on baseline or as-built project data? • Can benchmarks be broken down further within A1-A5 stages?	The embodied carbon benchmark includes Verified As-Built IS Materials Calculator outputs; this only captures A1-A4. Due to the variability in calculation methods for B6, this has been omitted for the time being. A5 has been included, as this provided by verified As-Built IS energy models. Input data can be broken down into lifecycle stages, however, this was not the intent or scope of the project

• How do these benchmarks compare with the National Embodied Carbon Databook? • Has grid decarbonisation been normalised when comparing historical and recent projects?	and therefore correlation at this level has not been explored at this stage. The National Embodied Carbon Databook is informed by predicted expenditure on materials and aggregated carbon emission activity data at the economy level with the inputs obtained from Infrastructure Australia's 2024 study, Embodied Carbon Projections for Australian Infrastructure and Buildings, where this benchmark is informed by As-built project data. Grid decarbonisation has not been normalised for the input data. This is due to the variety of electricity inputs into the supply chains of the various materials used in the infrastructure assets studied. To take grid decarbonisation into account properly, the technological make-up of the supply chain of each material needs to be available and the linkages between the electricity mixes needs to be understood and evolved over time. Given the international nature of supply chains, national or subnational grid decarbonisation models need to be implement for proper accounting. This was totally out-of-scope for this project, but an important future work to be conducted. The PREMISE python package to model grid decarbonisation in Ecoinvent is an interesting step in this direction.
Relationship with Existing Carbon Assessment Tools and IS Rating	
Audience questions: • Will projects still use the IS Materials Calculator? • Is there an intention for the new tool to replace existing calculators? • How does the benchmark correlate with IS Materials Calculator results or other LCA models? • What does the "alternative pathway" refer to? • Is it an alternative to Ene-1 benchmarking or Rso-6 modelling? • Can non-ISC-rated projects use the tool?	Non ISC projects can use the tool. The benchmark can be used with any carbon data if the model includes A1-A5. The ISC strongly recommend that Verified data be used to ensure inputs are accurate and comparable. For IS rated projects utilising the IS Materials Calculator, the outputs of this, combined with the outputs of a project's Ene-1 model, can be used as inputs into the IS Insights Embodied Carbon Metric. The ISC has designed an innovation challenge to reward projects going through Rating for undertaking this benchmarking exercise. Similarly for any projects not undertaking and IS Rating or using a different LCA tool, their A1-A5 can be input into the portal for benchmarking. IS Insights does not replace the Base Case approaches for Ene-1 and Rso-6/Mat-1. The Base Case approach

	compares a project against a less developed version of itself and remains valuable for detailed design optimisation. IS Insights provides an additional pathway that benchmarks a project's performance against other projects. ISC does not intend for one method to replace the other, as each has distinct benefits and use cases. Instead, providing both pathways gives projects greater flexibility to tailor the rating process to their context. For example, where a project's scope is largely fixed, developing a Base Case can be a resource-intensive exercise with limited value, whereas the lighter-touch IS Insights pathway may be more appropriate.
Scope, Coverage and Future Expansion	
Audience questions: • Is the tool currently limited to transport and infrastructure projects? • Are there plans to include energy and transmission projects? • Will B-modules be incorporated in future? • Have other Scope 3 emissions been considered? • Could water consumption be integrated in future versions? • Is there any New Zealand data included? • Does the model consider geographic differences?	The tool covers currently transport and infrastructure project due to the data availability. As the data set grows it will hopefully include water assets, energy generation and transmission assets, ports/airports and more. Scope 3 was considered in the data analysis but due to the variability of boundaries and methodologies it was not included. The ISC intend to expand the platform to incorporate water consumption, resource outputs/waste, biodiversity and more in the future. Yes, there is a small number of NZ data points. The ISC are aiming to strengthen the NZ representation in future updates. The model does not currently consider geographic differences, but it has been included in the data and could be incorporated at a later date if trends are identified.
Application Across Different Project Types	
Audience questions: • How should mixed-asset projects (e.g. roads, bridges and pathways) be assessed? • Does the model account for regional versus metropolitan differences? • What project types and project values currently achieve high confidence levels?	For mixed assets, the sub-type of asset that is the largest portion of the project is the assessed asset sub-type. The model does not currently consider regional versus metropolitan differences, but it has been included in the data and could be incorporated at a later date if trends are identified.

	Rail surface currently has the highest confidence levels. Project values within the data range of the benchmark have the highest confidence levels.
Carbon Reduction Insights and Practical Benefits	
Audience questions: • How has Spark used the tool to identify carbon reduction opportunities? • Does the tool provide guidance on reduction opportunities? • Do recommendations align with IS credits?	Spark has not used the tool to identify carbon reduction as the project was too far progressed by the time of publishing. In future instances, the project could be adopted for option planning and comparison, target setting, performance incentivisation and more. No the tool does not provide guidance on reduction opportunities, it is a high-level carbon performance benchmark. The benchmarked footprint aligns with the footprint assessed under the Ene-1 and Rso-6/Mat-1 credits; however, the tool serves a different purpose and use case, so separate credits will be available. As a result, a project may perform exceptionally well against a Base Case credit but comparatively poorly against the Embodied Carbon Metric, and vice versa.
Project Delivery and Assessment Process	
Audience questions: • At what project phases should carbon assessments be undertaken? • Have comparisons been made between assessment stages? • What insights have emerged from assessments across project lifecycle phases?	The carbon budget function could be used in all stages to determine what the project expected carbon emissions will be. The benchmark function could be used at the end of the design or construction phases to understand the carbon performance of the project against industry performance.
Compliance, Governance and Industry Alignment	
Audience questions: • Is the tool compliant with Infrastructure NSW and Infrastructure Australia requirements? • How does it align with industry reporting expectations?	The Universal Benchmark is a supplementary A1–A5 estimation and performance-benchmarking tool that is broadly aligned with the national embodied-carbon measurement framework. Its use does not, by itself, satisfy all Infrastructure NSW or Infrastructure Australia

• Does it support emerging disclosure requirements?	measurement, reporting and economic-appraisal requirements. The Universal Benchmark aligns well with emerging industry expectations for transparent and comparable carbon reporting. Its main strength is that it adds a cross-project performance benchmarking layer that conventional project carbon reports generally lack. The tool could be used to set carbon reduction targets to support disclosure requirements.
Product Rollout and Industry Adoption	
Audience questions: • When will the Innovation Credit Guideline be updated to include IC-8? • Are there plans for a national launch event or industry engagement activities?	A copy of IC-8 is now available through ISPMs for projects to use. The IC will be added to the innovation challenge appendix by Nov 30th 2026. The ISC will be showcasing the IS Insights platform as part of ISC's Sustainability Summit series through 2026 and 2027.