



MI-ROG

Embedding circular economy principles into infrastructure operator procurement activities

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Foreword



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Procurement is vital for embedding circular economy principles in infrastructure design and operation. With the infrastructure sector's greatest potential for contributing to the circular economy during the optioneering, feasibility and early design stages of schemes, procurement policies will be significant drivers in achieving the transition.

Importantly, given the large sums of money spent on infrastructure in the UK and the vast materials requirements for their construction, implementing circular economy approaches in the procurement activities of owners and operators will likely have a significant knock-on effect across the wider market.

In this context, this Major Infrastructure – Resource Optimisation Group (MI-ROG) white paper discusses the risks and opportunities associated with changing infrastructure procurement policies in order to accelerate the circular economy in infrastructure.

A key theme in the white paper is collaboration, recognising that mainstreaming circular economy principles will only be achieved through cross-sector collaboration. Collaboration is also behind the ethos of MI-ROG. The group was set up three years ago as a regular forum for infrastructure owners and operators to share best practice and to facilitate opportunities for collaboration across programmes and projects.

The first forum of its kind in the infrastructure sector, MI-ROG has accomplished much since its inception. The group has inspired and facilitated workflows on important issues such as asset life cycle, carbon performance, circular economy planning, critical materials availability, materials exchange and sustainable procurement and supply chains. Several of the group's participants are now working together on programme collaborations around materials resources, focused on diverting surplus materials from one major infrastructure programme for use on another.

Last year, for the first time, MI-ROG participants compared notes on integrating capital and operational carbon in asset design and management. As a precursor for the harmonisation of approaches to internalise carbon, this will yield efficiencies for operators and owners, as well as their supply chains.

This white paper is the group's latest initiative to integrate circular economy thinking into common approaches to procurement. The work is absolutely vital for the circular economy and I fully expect the ideas it outlines to be a further catalyst for a supply chain-wide shift to circular economy approaches in UK infrastructure.

With participants including some of the UK's largest infrastructure owners and operators, MI-ROG continues to develop its thinking around the recoverable aspects of major infrastructure assets and integrating that knowledge into procurement, design and decommissioning efforts.

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Introduction

Infrastructure investment in the UK continues to gather pace. The government's National Infrastructure Delivery Plan outlines details of £483 bn of investment in over 600 infrastructure projects and programmes. But as plans develop for these ambitious new projects and major maintenance and renewal programmes, there will be increasing pressure on the local availability of construction materials and associated logistical pinch points.

Recognition of the need for greater resilience in infrastructure supply chains is driving a growing interest in the circular economy. A whole life approach to the development of critical infrastructure, with assets and materials kept at their highest value for as long as possible, has huge potential to deliver cost efficiencies and net positive environmental impacts, together with reputational and customer benefits. Mainstreaming these circular economy principles, such as designing for disassembly and remanufacture and innovative procurement that encourages service over product, requires effective collaboration.

For those infrastructure operators starting out on circular economy initiatives, it is important to consider the circular economy as a natural progression from pre-existing infrastructure initiatives, commitments and practices, such as resource efficiency, revenue generation through material sales, and reducing waste disposal to landfill. In this way, further ambition can be levered off what's working now.

MI-ROG, was founded in 2013 as a forum to collaborate across the circular economy theme and to meet the challenge of delivering infrastructure in a constrained economy. MI-ROG members recognise that the circular economy cannot be achieved in isolation and that collaboration and collective leadership is essential.

Coupled with this is the recognition that procurement policies and approaches adopted by infrastructure operators can be a significant driver in achieving the transition to a circular economy. This shift can unlock cost and environmental benefits that may not be forthcoming using 'traditional' linear consumption approaches.

The principles of the circular economy closely align with MI-ROG's purpose, in that the aims are to:

- keep resources in use for as long as possible
- extract the maximum value from resources while in use
- recover and regenerate products and materials at the end of life
- keep products, components and materials at their highest utility and value at all times.

Moreover, the greatest potential for improving resource efficiency and contributing to the circular economy in infrastructure delivery occurs during the optioneering, feasibility and early design stages.

By including procurement criteria focused on the circular economy from the outset of infrastructure schemes, owner/operators can embed circular economy approaches and drive the market. Such gains can be cemented by taking a consistent approach to procurement across major infrastructure projects.

The circular economy and risk — effective infrastructure delivery?

In addition to considering circular economy opportunities as early as possible in the project lifecycle, effort needs to be applied to more effective engagement between procurement teams and project managers writing detailed specifications, and between operators and their suppliers.

Taking a circular economy approach requires a degree of innovation in procurement and technical specifications. Existing technical standards can often be a barrier to innovation, which may result in procurement practices restricting innovation by being too prescriptive, leading to tenders based on familiar approaches.

At the other extreme, expecting very large infrastructure schemes to take on the risk of wholly new materials or methods with no track record is also unrealistic. Innovation must offer improvements over industry best practice, but also be implementable, which requires some degree of track record/proof of concept to substantiate any benefits claimed.

Different approaches to procurement may encourage innovation by asking for 'services' rather than established specifications, particularly at

contract or framework renewal. Such service requirements can be 'blind' to material specifications, focusing more on the 'what' than the 'how' of effective delivery. The potential increased risk in service delivery to both client and contractor can be mitigated by an evaluation of new solutions through demonstration or pilot projects before widespread adoption.

Alternative methods for risk mitigation may include risk-sharing opportunities through mechanisms such as collaborative performance frameworks or Design Build Finance Operate (DBFO) procurement models. These procurement processes can more readily include desired circular economy outcomes. Value chain plans will be important too as operations, teams and technology will change over the infrastructure's lifespan.

Procurement guidance

Opportunities to identify changes in procurement procedures could be highlighted through:

- Identifying which procurement activities your circular economy principles are most relevant to — working cross-functionally to understand material flows, identifying value and where the key opportunities lie — for example, in the modularisation of different infrastructure components and their tracking and re-purposing over product life.
- Developing innovative performance frameworks with suppliers that reward circular economy outcomes, sharing risk in bringing in new materials, end of life approaches or new service models.
- Establishing working groups to develop circular economy business models, identifying key benefits, analysing and developing focused action plans, informing and influencing stakeholders.
- Working cross-functionally to develop 'themed' working groups for various infrastructure supply chains — for example, electronic equipment, personal protective equipment, to support procurement development of specifications.



Procurement guidance cont'd

To drive further integration of the circular economy into infrastructure design and operation, MI-ROG suggests the following questions for consideration in procurement processes with key suppliers:

- Provide examples of how you have integrated circular economy principles, for example:
 - keeping resources in use for as long as possible
 - extracting the maximum value from resources while in use
 - recovering and regenerating products and materials at the end of life
 - keeping products, components and materials at their highest utility and value at all times.
- Highlight how solutions were identified and benefits were quantified
- Demonstrate how your design will encompass the circular economy, giving examples of your choice of construction materials and processes and quantifying the total benefits, compared to a standard approach. This should include:
 - maximising retention/reuse of existing assets
 - minimising the use of non-renewable primary materials
 - reducing waste
 - ensuring longevity
 - maximising the value of materials once the original purpose is accomplished.
- Demonstrate how your product/material will contribute to the circular economy, through:
 - offering a service model
 - providing a take-back scheme
 - ensuring recyclability which retains value
 - offering enhanced recycled content
 - minimising packaging and using recycled, recyclable or compostable packaging
 - minimising the use of non-renewable primary materials, reduced waste, and maximising the value of the materials when no longer required.

The above could be achieved through an evaluation that rewards suppliers that demonstrate experience and approaches that are aligned with these aspirations such as:

- maximising retention/reuse of existing assets/materials
- minimising the use of non-renewable primary materials
- reducing waste (in manufacturing, construction and operation)
- ensuring longevity
- creating assets that are demountable/deconstructable/recoverable
- using materials that are fully reusable, recyclable or compostable.

Evaluation should be made on the basis of "Whole Life Value"—not based on price alone, but including commissioning, maintenance and disposal costs of the infrastructure required across the life cycle.

MI-ROG was founded in 2013 and is convened by AECOM. The Chairman is Robert Spencer. MI-ROG participants represent organisations including, EDF Energy, the Environment Agency, Highways England, HS2, National Grid, Network Rail, Heathrow Airport Ltd and Tideway. The views expressed in this thought piece are not necessarily the views of the organisations named.

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