

Call for Proposals – Expert Facilitator to deliver CIRCULÉIRE’s Thematic Working Group on ‘Industry 5.0 and the Circular Economy’

CIRCULÉIRE - the National Platform for Circular Manufacturing - is requesting applications from suitably qualified ‘Expert Facilitators’ to coordinate and deliver our forthcoming Thematic Working Group on ‘Industry 5.0 and the Circular Economy.’

Each year for the duration of the programme, CIRCULÉIRE’s industry members vote on topics that they deem strategically important to enabling – or preventing - their transition to a circular economy. In 2022, ‘Industry 5.0 and the Circular Economy’ was selected as a top priority topic for the CIRCULÉIRE network to run a Thematic Working Group on.

Run over a series of virtual meetings, workshops and a policy roundtable, the Expert Facilitator will convene a small group of key stakeholders representing industry and non-industry panel members to jointly explore and co-develop thought leadership on the key role that Industry 5.0, digitalisation and advanced technologies (e.g. Additive Manufacturing, Artificial Intelligence (AI), automation and robotics) can play in supporting Irish industry’s transition to a circular economy and towards a more sustainable and resilient society and economy.

Background - how can Industry 5.0 accelerate Ireland Inc’s transition to a Circular Economy?

Digital and advanced technologies have a vital role to play in leading to more efficient and flexible production processes with increased resource efficiency in terms of both energy and materials ([EI; 2019](#)). A critique of past digital strategies for industry, however, is that they are not sufficiently focussed on sustainability or respect for planetary boundaries, and that they can encourage digitally-enabled extractive and consumptive economic activity, contributing to an overall acceleration of negative climate impacts and ecosystem loss (EC, 2021; 8).

Industrial digital and technological paradigms must therefore set out a clear ambition to support industry’s transition to regenerative, circular economy pathways, based on intensified renewable energy usage and circular value chains. When applied effectively, digital solutions and advanced technologies can open up several opportunities for manufacturers and their supply chain partners to achieve sustainable, circular economy implementation, including:

1. Smarter, more agile, resource-efficient and sustainable manufacturing firms:

- **Automation, [Artificial Intelligence \(AI\)](#), analytics and [IoT technologies](#)** can enable firms to detect abnormal usage trends for energy, water, and other resources, flagging issues, detecting patterns, and enabling optimisation of resources-use over time. Meanwhile, robotics, automation and AI can also increase resource productivity in design, production and supply-chains e.g. iterative machine-learning-assisted design processes; automated condition assessment of used products; automated disassembly and sorting of mixed material streams using visual recognition and robotics ([CIRCULÉIRE Circular Maturity Model, 2022](#)).
- **Digital twins:** Intelligent, data-driven, and IoT-based solutions can enhance asset life cycle, enable parts reuse, and build sustainable manufacturing enterprises. For instance, companies can analyse real-time sensor data from assets and equipment to visualize the

performance of industrial assets and processes to design interventions that can prolong the life of critical equipment ([TCS, 2020](#)).

2. **Growing the market for secondary raw materials:**
 - The use of cyber-physical systems can make the development and marketing of secondary raw materials simpler e.g. the use of smart sensors to determine and collect data on the composition, quality and flow of materials, as well as platforms to match supply and demand (Riesener, M., et al. 2019).
3. **Keeping components, and products in-use in the economy for as long as possible:**
 - **Additive manufacturing**, which refers to the creation of objects by adding material, has a role to play in enabling the repair, renovation and remanufacturing processes of products ([Leino et al, 2016](#); [Colorado et al., 2020](#)). 3D Printing, for instance, can optimise resource usage through small batch production, rapid prototyping, utilising alternative materials; designing with fewer materials and ability to produce replacement parts, and products optimised for remanufacturing.
 - Digital technologies can help facilitate multiple uses of products over several stages, increasing the overall time a product or product parts are in use. Information gathered via IoT technologies can enable companies to predict product conditions, status, location, and usage. Analysis of collected data allows companies to provide technical support and other services, such as repair and management of spare parts, and to tailor services and products according to the need of consumers ([EPA Network, 2021](#)).
4. **Helping to close the loop at key stages of the product/material lifecycle:**
 - Digitalisation can play a role in closing material loops, simplifying the collection of the products and logistics, to bring them back to the recycling facilities at their end-of-life. Here the use of sensors, tags, digital twins, machine learning and other technologies can enable better and more efficient waste collection ([ECERA, 2020](#)), in supporting reverse logistics and in enabling the shift towards collaborative sharing economy and Product-Service business models.
 - **Blockchain-based systems of record:** Companies can use blockchain to build a single, unified system of record for creating lineage traceability and transparency, enabling reduce-reuse-recycle and closed-loop supply chains ([TCS, 2020](#)). For instance, blockchain-based digital product passports, such as those proposed as part of the [Sustainable Products Initiative](#), could contribute to simplified data collection to facilitate tracking and appropriate handling of a products materials and components – leading to greater resource efficiency and improved reuse, repair and recovery practices.

Despite the opportunities that advanced technologies combined with digital transformation can unlock for companies looking to transition to a circular economy, a number of challenges remain - such as data collection, security and ownership, hiring and developing the right organisational competences, changing mindsets and financing the transition. Meanwhile, careful consideration must also be given to minimising the negative environmental impacts of data centres, digital and advanced technology devices and digital infrastructures which require (often critical) levels of energy and materials ([ECERA, 2020](#)).

Thematic Working Group (TWG) Process and Aims

CIRCULÉIRE is seeking to appoint a suitably qualified Expert Facilitator to guide our industry members and key stakeholders from the wider ecosystem to better understand the key opportunities, challenges and trends that Industry 5.0 (both digitalisation and advanced technologies) can play in supporting Irish industry's transition to a net-zero carbon circular economy.

The aims of this TWG are thus as follows:

1. Increase CIRCULÉIRE’s panel members’ (including Industry Members’) knowledge and awareness of Industry 5.0 technologies, trends and best practices, exploring the opportunities and challenges it presents to accelerate and enable Irish industry’s transition to circularity;
2. Convene a working group – comprised of industry representatives and senior stakeholders – to co-produce high-quality thought leadership aimed at advancing Irish industry’s circular transition (producing high-quality outputs and proposing practical, actionable recommendations as appropriate);
3. To design and deliver 2x Ideation Workshops where the working group identify min. 7-10 digital/advanced technology circular innovations (e.g. related to platforms, processes, products and/or people) that support Irish industry’s circularity transition, and which have potential to reduce industry’s GHG and waste and improve material efficiency if implemented in the future.

Key Activities to be delivered by the Expert Facilitator

Over a 12 – 16-week period the successfully appointed Expert Facilitator will deliver a series of meetings, workshops and webinars; each aimed at achieving the objectives of the TWG.

Table 1. Scope of Work and Deliverables

Activity	Anticipated Scope	Output
10 one-to-one calls with CIRCULÉIRE Industry Members	<ul style="list-style-type: none"> • To ensure the activities and final deliverables meet industry needs, the Expert Facilitator will lead circa 10 one-to-one short (circa 30-minute) calls with CIRCULÉIRE members at key points in the TWG process to assess industry’s current digital maturity and to identify key challenges and opportunities related to leveraging digital technologies as an accelerator and enabler of circular economy for their company and wider sector; • Proposals for a limited number of 1:1 interviews with additional stakeholders are also invited; 	<ul style="list-style-type: none"> • Call sheet / interview guide to be prepared • Minutes to be shared with CIRCULÉIRE
Meeting 1: Welcome session	<ul style="list-style-type: none"> • Welcome & Icebreaker; • Overview of the aims and expected approach of the Working Group; • Introduction to key digital/advanced technology trends driving industry’s circular economy transition; • Interactive discussion to tease out the key barriers to achieving a digital circular economy e.g. energy and material intensity of data centres, digital devices and digital infrastructures; • Devising an approach to take stock of industry member’s current ‘digital circular maturity’; and gather insights about what panel members’ main priorities are for the TWG; 	<ul style="list-style-type: none"> • Slides to be circulated following the meeting

Activity	Anticipated Scope	Output
Seminar: Industry 5.0 and the Circular Economy – state of play and gaps in Ireland and Beyond	Expert facilitator to present: <ul style="list-style-type: none"> • Overview of key trends, challenges and opportunities for Irish and European industry in leveraging digitalisation & advanced technologies to accelerate the transition to a circular economy; • Presenting of circa 10 industry best practices of digitally-enabled/advanced technologies applied to circular economy to prompt and inspire Industry Members; • Highlighting the role of the public sector, industrial policy & R&I funding in enabling a digital circular economy in Ireland and Europe • Overview of relevant national and EU policies and regulations (e.g. the Sustainable Products Initiative and Digital Product Passports which will require companies to address the sustainability of their products and provide data to trace materials and components through their entire lifecycle). • A worksheet (developed by the Expert Facilitator) to be shared with panel members during the workshop to guide reflection in advance of the Ideation Workshops. This should tease our insights related to their digital circular economy maturity, specific needs and goals, as well as opportunities areas where digital circular solutions could play a role for their company or wider sector; • Q & A; 	<ul style="list-style-type: none"> • Short post-workshop document to be shared with IMR synthesising 7-10 key challenges / opportunities (which could be the explored by panel members in the Ideation Workshop) • A recording of the seminar to be made available for CIRCULÉIRE's industry members
IMR Showcasing Event (Virtual event)	<ul style="list-style-type: none"> • The Expert Facilitator will moderate a virtual showcasing event, with presentations delivered by IMR highlighting IMR's work in this domain e.g. through projects like AI4CE; CircThread, and IMR's work supporting industry to strengthen their digital capabilities; 	<ul style="list-style-type: none"> • Slides (based on presentations given by IMR) to be circulated to panel members
2 x Ideation Workshops (In-person / Online Workshops) 'Identifying 5-7 Digital Circular Economy Innovations to support Ireland Inc.'s transition'	<ul style="list-style-type: none"> • Based on the 1:1 calls, prior workshops and desk research, it is anticipated that the Expert Facilitator will undertake some preparatory work to help organise the Ideation Workshop participants into appropriate subgroups (e.g. by sector / industry; challenge; technology of interest, potential for impact; etc.); • The Expert Facilitator will develop a plan for a well-designed 2-day in-person / online ideation workshop where panel members will identify opportunities for 7-10 innovative solutions to deepen and strengthen Irish industry's Digital/Advanced Technology capabilities and operations for a Circular Economy; • Aim should be for the working group to identify 7-10 strategic and diverse solutions that address the core challenges and/or opportunities 	<ul style="list-style-type: none"> • Short Ideation Workshop report

Activity	Anticipated Scope	Output
	<p>identified, and critically, which could play a role in reducing Irish industry's GHG and waste. Particular attention should be given to how these solutions can break down industry siloes (e.g. by promoting value chain / industry cluster collaboration), and support industry to deepen its Industry 5.0 capabilities.</p>	
Meeting (Virtual): Reflections from the Ideation Workshops	<ul style="list-style-type: none"> • Summarise and refine the key takeaways and proposals for innovative Digitally-enabled/Advanced Technology Circular Economy solutions identified during the Ideation Workshop; • Collate key lessons, tips and good practices and available supports aimed at strengthening industry's Industry 5.0 capabilities for a circular economy; • Gather insights for recommendations about how the digital and advanced technology landscape might be enhanced to support Irish industry's circularity and sustainability objectives, and what role the public sector and other key stakeholders could play to achieve this; 	<ul style="list-style-type: none"> • Short 3–5-page industry briefing
Roundtable Discussion	<ul style="list-style-type: none"> • Presenting headline results from the Ideation Workshop Report and Industry 5.0 and Circular Economy briefing for discussion; • TWG key recommendations for discussion with panel members and key decisionmakers in attendance e.g. the EPA; DECC; Enterprise Ireland; DETI; EIT Climate-KIC; 	<ul style="list-style-type: none"> • Finalised circa 5-page Industry 5.0 and the Circular Economy briefing (to include recommendations for priority stakeholders e.g. a) Industry; b) Public Sector c) Funders & Investors)
Public Webinar	<p>Here the Expert Facilitator will present the main findings and results of the TWG to a public audience, including:</p> <ul style="list-style-type: none"> • Summary of the key trends, challenges and opportunities for Irish industry in leveraging digitalisation and advanced technology to accelerate the transition to a circular economy; • Presentation of the industry-focussed best practice case studies and projects identified to bring the discussion to life; • Highlighting the key gaps and opportunities identified by panel members; • Summary of key results and innovative Industry 5.0 solutions identified during the Ideation Workshops; • Finalised recommendations and conclusions of the TWG; • Promoting the final outputs produced to a public audience; 	<ul style="list-style-type: none"> • Webinar recording • Slides

Expected Final outputs:¹

- 1-2 visual and practical artefacts (such as a fact sheet / infographic) to be developed e.g. key trends and drivers of Industry 5.0 for a Circular Economy plus any current gaps identified and how they might be addressed.
- A 3–5-page finalised industry briefing that summarises the key digital and advanced technologies circular economy trends and recommendations identified, as well as key lessons, tips and good practices and available supports aimed at strengthening industry’s digital and advanced technology capabilities for a circular economy;
- 20 – 30-page Ideation Workshop report that summarises the Ideation Workshop’s approach, and details of 7-10 digital circular solutions identified by the working group (emphasising their potential for impact if implemented);

About the Expert Facilitator

The Expert Facilitator will support the goals of the Working Group by delivering well-designed workshops and meetings to the Working Group’s panel members. You will be comfortable facilitating a diverse group of circa 20 cross-sectoral panel members, who are expected to consist of a mix of CIRCULÉIRE industry members, and representatives of the public sector and enterprise support ecosystem.

You will be comfortable undertaking background research to identify international industry best practices examples of digital and advanced technologies for a circular economy, translating this into practical and easy-to-follow case study examples that raise the awareness and understanding, and to prompt dialogue and reflection for panel members. You will be responsible for producing high-quality industry-focused deliverables and outputs in a timely and efficient manner.

The successful consultant will have a deep understanding of the Irish and European circular economy and Industry 5.0 landscapes. You will have strong facilitation and co-design experience, playing a strategic role coaching and guiding the panel members to identify a range of solutions aimed at enabling Ireland Inc. to transition to a net-zero carbon, circular economy through the effective use of digital and advanced technologies, and in so doing achieve Ireland’s climate and sustainability targets.

Ensuring good cross-organisation alignment

The successful Expert Facilitator will play an important role in achieving the strategic objectives and impacts of the network related to this TWG. To ensure good cross-organisational alignment between CIRCULÉIRE Secretariat (IMR), and Strategic Partners (e.g. the EPA, DECC and EIT Climate-KIC), the Expert Facilitator is expected to attend some internal meetings at key points in the process. Some ad hoc check-in meetings with IMR will also be required ahead of key activities.

¹ Near-final drafts should be produced for all final outputs review and comment by CIRCULÉIRE’s secretariat, IMR / another appointed external peer reviewer. The finalised version of all outputs should have key comments addressed.

2022 TWGs Indicative Dates

Kicking off in late July 2022, this Thematic Working Group (TWG) will run until September (Q3-4), 2022 for a period of approximately 12- 16 weeks.² Questions on this specification should come in writing to IMR (details below). We will collect questions until **midnight Tuesday, 12th of July**.

Deadline for applications to circuleire@imr.ie is **midnight, 18th of July**. Applications to be emailed using subject heading 'Expert Facilitator application – 'Industry 5.0 and the Circular Economy' with completed Excel Application Spreadsheet Template attached. Applications will be assessed against relevant knowledge and experience, and proposed approach to delivering the activities. This work has a maximum allowable budget of €20,000.00 ex. VAT.

Indicative dates on the Call for Proposal:

- Open questions from submitting parties closed **midnight, Tuesday, 12th of July**.
- Deadline for RFP submission to circuleire@imr.ie: **midnight, 18th of July** (with completed Excel Spreadsheet using subject heading 'Expert Facilitator application – 'Industry 5.0 and the Circular Economy')
- Interviews with shortlisted applicants: **Circa 22nd of July**
- Communication of successful candidate: **25th of July**
- Internal kick-Off Meeting to Agree Timeline: **W/C 28th of July**
- TWG commences: **W/C 8th of August**

IMR Contact Person: Sophie Reynolds, Circular Economy Technologist; E: sophie.reynolds@imr.ie

About CIRCULÉIRE

CIRCULÉIRE's mission is to demystify, derisk, and deliver circular business model innovation by unlocking the value that resides in an Irish circular economy. CIRCULÉIRE is a public-private partnership created by Irish Manufacturing Research and the Department of the Environment, Climate and Communications (DECC), the Environmental Protection Agency (EPA), and EIT Climate-KIC with 25 Founding Industry Members.

Between 2020 and 2022, CIRCULÉIRE will take manufacturers and their supply-chains on a journey from linear to circular business models through baselining, auditing, business case development and deep demonstration innovation projects delivering significant reductions in greenhouse gas emissions (GHGs) and in waste production across the network.

² A more detailed timeline will be agreed with the consultant as service contracts are being drawn up.