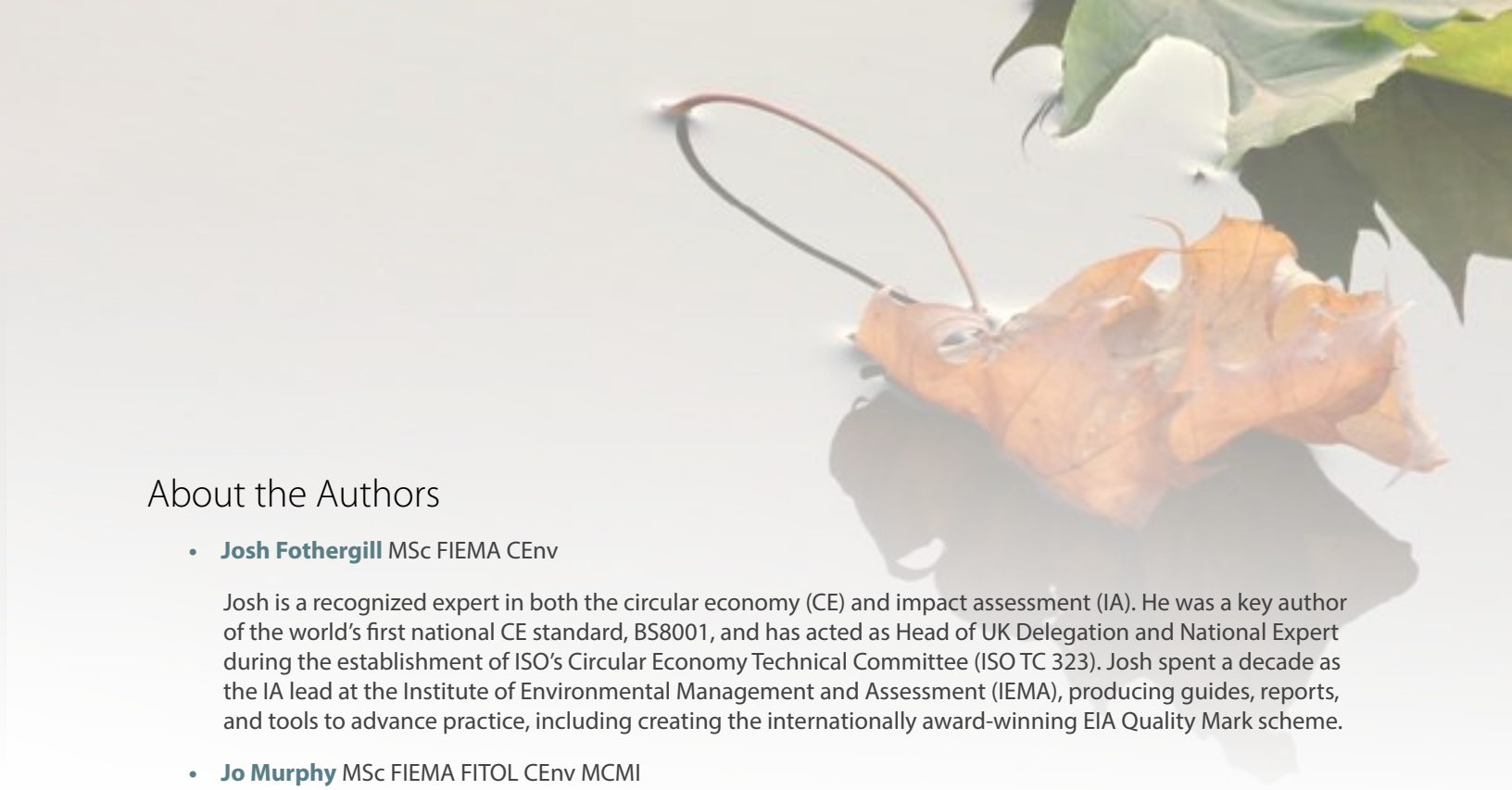
The Circular Economy and Impact Assessment

A Primer

February 2021

IAIA International Association for Impact Assessment

FOTHERGILL Training & Consulting



About the Authors

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  Josh is a recognized expert in both the circular economy (CE) and impact assessment (IA). He was a key author of the world's first national CE standard, BS8001, and has acted as Head of UK Delegation and National Expert during the establishment of ISO's Circular Economy Technical Committee (ISO TC 323). Josh spent a decade as the IA lead at the Institute of Environmental Management and Assessment (IEMA), producing guides, reports, and tools to advance practice, including creating the internationally award-winning EIA Quality Mark scheme.

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- And finally, to all 515 of the IA professionals—IAIA members or otherwise—who completed the research survey and shared their knowledge and perspectives on the circular economy.

Purpose of this Primer

This primer is part of a wider piece of research to explore and define links between impact assessment (IA) and the circular economy (CE). The purpose of the project is to help ensure that IA professionals are ready and able to influence the transition to and operationalization of the circular economy within their work with private developers, financial institutions (FI) and government—national, regional, and local.

This primer is designed to enhance knowledge and understanding of the CE among IA professionals and help to set out different ways they can help enable circularity to progress sustainable development. As such, the primer is not a "how to" guide, but instead helps to set the context for the International Association for Impact Assessment (IAIA) and its membership to engage head on with this growing area of the sustainability field. The research and primer's production were kindly supported by an IAIA Innovation Grant.

How to use this Primer

This primer can be read from cover to cover; however, it is equally designed for IA practitioners to dip in and out of sections as needed. As such, IA professionals with a good understanding of the CE may want to jump straight to Section 4 and the more practice-oriented advice on advancing the consideration of circularity in professional practice.

While case studies of integrating the circular economy in IA are currently limited, the authors received many requests during the research to identify examples that can help make the connection between IA activities and progress towards a circular economy more tangible. As such, between Sections 1-2, 2-3, and 3-4 of the primer Sections we set out case studies that contributing IA professionals indicated they had found useful in building their understanding of issues and concepts related to the circular economy.

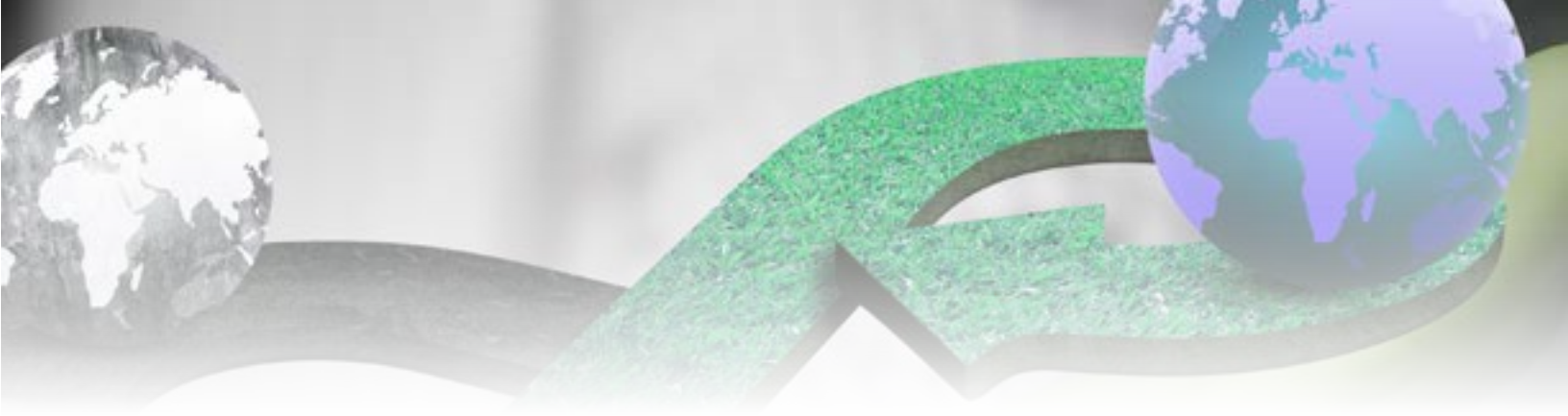
So where should you start?

- **Starting out with the circular economy/building understanding?** Section 1 tackles the question "What is the Circular Economy?" and builds from there.
- **Interested in evidence of IA professional interest in this area?** Section 2 provides a summary of this information gathered by the research behind this primer.
- **Seeking to understand why IA is well placed to progress circularity?** Section 3 discusses this explaining the value of IA professional skills and SDG links.
- **Want to get practical and link your next IA to the circular economy?** Section 4 sets out advice on how to start thinking about this in different contexts.
- **Only have 5 minutes to understand the key issues about IA and CE?** Check out the 2-page IAIA FasTips "An Introduction to the CE for IA Professionals" and come back to explore this primer when you have more time! www.iaia.org/fasttips.php

Image by Nattanan Kanchanaprat from Pixabay

Contents

Case Studies



1. What is the Circular Economy?

The circular economy (CE) is a new way to design, make, and use things within environmental limits, moving away from our current linear approach of "take-make-use-waste" and its global to local damaging consequences. It presents a vision for humanity's global economic system operating within the environmental and social limits defined by sustainable development.

The concept of a circular economy has arisen in response to the all-too-visible consequences of current patterns in global economic consumption and production. Such unsustainable development is, in part, the result of our linear economy. The majority of our global to local systems are founded on this, where we take natural resources, make a product/support delivery of a service, and then dispose of that material through illegal/legal dumping or burning. The results of this wasteful system generate many problems, not just environmental and social, but increasingly economic issues, including the loss of valuable resources and rare materials.

The environmental and social consequences of this linear approach are well known to the impact assessment (IA) profession, and include the global challenges of poverty, climate change, inequality, and the biodiversity crisis. The IA community, alongside other sustainability professionals and an ever-growing number of businesses, communities and individuals recognize this pattern of economic activity is unsustainable.

The IA process, in its many forms of environmental, health, social, etc., identifies and informs stakeholder and decision makers of the future consequences of current or proposed actions[1], with the aim of enhancing positive and reducing negative outcomes. More broadly, there is well known global initiatives to tackle climate change and enable sustainability, including the legally binding instruments in the Paris Agreement, and the related national level laws, policies, and targets. Equally, the United Nations (UN) developed and agreed the Sustainable Development Goals (SDGs) to provide a collection of goals, indicators and targets to help guide current activities—across policies, plans, programs and projects—toward the delivery of more sustainable development[2].

Both the Paris Agreement and the SDGs set out a clear direction, but do not set out a road map to achieve a functional global economy that enables a sustainable future for humanity. This is where the CE provides a powerful ally, by establishing a clear and conceivable destination of a functional economy that is intentionally designed to be restorative in the use of material and regenerative to natural systems by aiming to keep products, components, and materials at their highest utility and value at all times[3]. The relationship between CE and the SDGs is explored further within Section 3 of this Primer.

CE's destination provides a road map to an economic model that can function within the doughnut[4], defined by an ecological ceiling of environmental limits and a social foundation of protections across issues ranging from food and housing to healthcare and political voice. The CE is a growing vision being used to shape and define routes to transition economies, sectors, businesses, and communities toward sustainability. For example, a 2018 TNO[5] report calculated that if the Netherlands could realize all its National CE Programme goals, the CE would contribute 20% of the Dutch target for GHG emission reduction (saving up to 7,7 Mton CO2 equivalent annually by 2030 and 13,3 Mton by 2050).

IA professionals have the necessary skills, knowledge, capabilities, and importantly, the presence across policy, plan, and project decision making, to play an important role in catalyzing this transition. However, as a community we must better understand the CE, the role we can play ourselves, and how to act in unison with other professions, so we make best use of these attributes to enable more sustainable decision making.

Visualizing the Circular Economy

The CE can be viewed as a system of stock maintenance. Our current linear economic approach degenerates available capital—manufactured, social, natural—by extracting it from the system and disposing of it, often after a single use. The CE, on the other hand, is a system intended to maintain and increase the stock of capitals by creating cycles. Examples of this include:

- ***Restoring manufactured capital stocks*** (goods, components and materials) back into the system. These can be perceived as a series of cyclical loops that help drive the effective use of capital and resources, rather than focusing solely on resource efficiency (using less—material, energy, labor). These loops range from sharing of goods (e.g., community tool sheds for loan across a village), through re-use and repair of products and material after the current user no longer needs them (e.g., the increased availability of refurbished laptops and printers), to more traditional recycling of materials to provide multiple-cycle feedstock into the manufacturing process, rather than requiring newly-extracted materials from natural systems (e.g., metal can recycling, reducing the need to extract virgin minerals through mining).

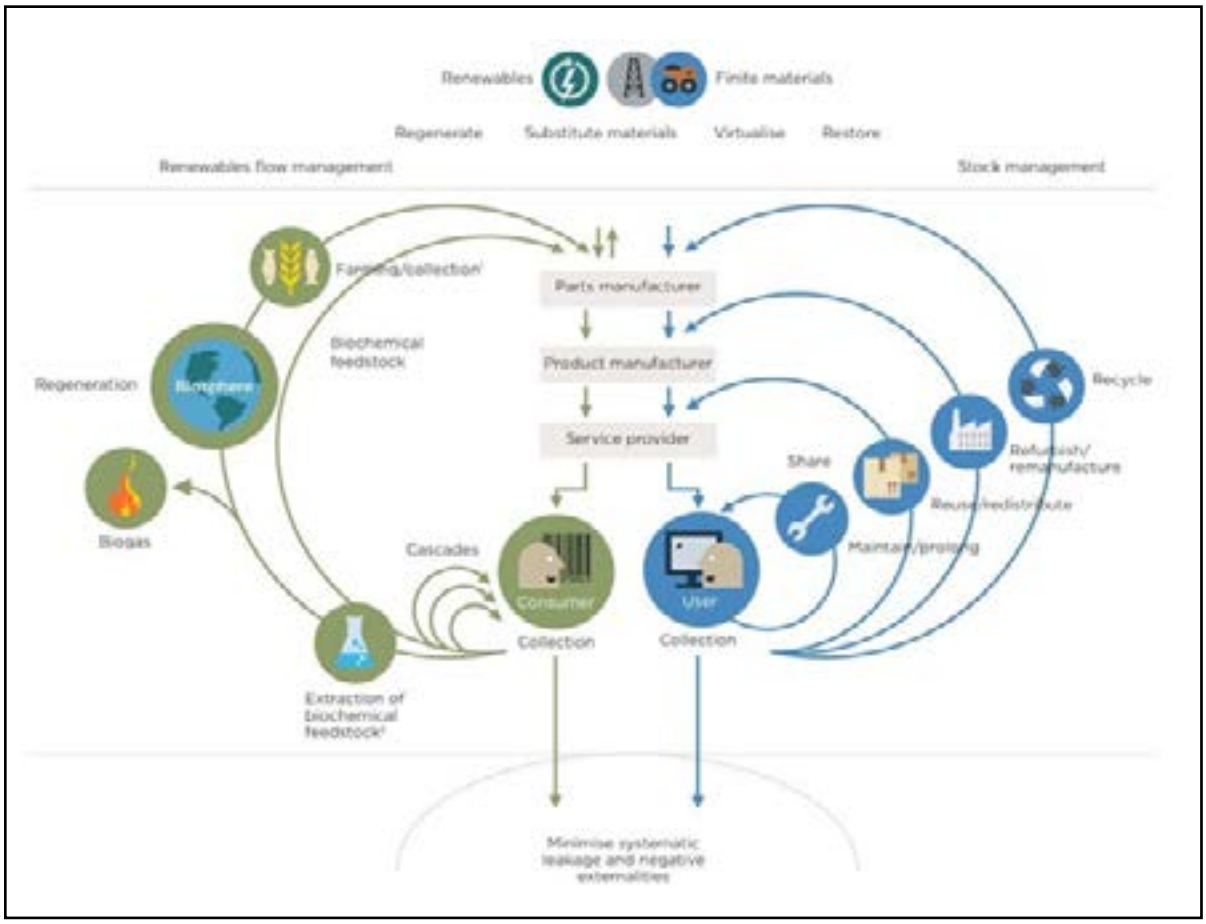
- ***Regenerating natural capital stocks*** (soils, species, habitats, and biodiversity) to maintain the system and enhance its future resilience. As above, these can be seen as a series of cyclical loops that minimize the loss of biological material from the system. A clear issue for the flow of natural capital stocks is understanding what can be returned to nature safely—with or without treatment—and what has become manufactured capital, despite being mainly derived from biological materials, and must be cycled in the above stock management process. For example, a simple cotton t-shirt may have additional components to deliver consumer performance (e.g., flame retardants) that mean it is no longer suitable for composting, as such additions can pose hazards if they are released into the natural world. Within the management of biological stock, avoidance of both overconsumption and wastage remains important (e.g., use of "ugly"/rejected crops from supermarkets, supporting food banks, etc.). Additionally, longer biological cycle processes are also needed, such as composting and the wider return of biochemical feedstocks to the natural system.

The CE's link to regenerating natural systems reminds us of the need for a closer link between people and nature. This approach is one that remains common among traditional farming and Indigenous communities but has become more distant in our globalized economy. As such, there is much to be relearned/adapted, in transition from our current linear economic system to a CE, from humanity's previous closer relationship with natural systems. There are also exciting opportunities for innovation to develop new ways to extract or generate complex chemical feedstocks from biological materials previously perceived as waste. For example, fish skin and scales contain an array of compounds that are now beginning to be extracted—to deliver high-value biochemical feedstock for manufacturing—before the remaining lower-value biological material is managed so it can be safely returned to help regenerate soils, etc.

This way of CE thinking—based on avoiding overconsumption and intentionally developing material cycles for what is produced and consumed—provides wider opportunities to drive and enhance human, social, and financial capital. The establishment of such cycles and any resulting wider enhancement is not guaranteed, however, and as with any development/change there is always the risk of generating unintended negative externalities. The ability to identifying such negative unintended environmental, social, and health impacts, before they occur, and influence private developers, financial institutions, and public sector decision making is a key trait of our IA profession. As such, a clear opportunity for IA professionals in helping enable an effective transition of policy, plans, and program (PPP) and projects toward the CE can be seen to exist.

The diagram in **Box 1** provides a visualization of the above CE concepts from the respected Ellen MacArthur Foundation. Often termed the *butterfly diagram*, **Box 1** helps visualize and demonstrate the various loops of biological and manufactured material cycling described above, which sit at the heart of a functioning CE.

Box 1: A visualization of the CE concept and the biological and technical cycles inherent within it



Source: Ellen MacArthur Foundation, SUN and Mckinsey Centre for Business and Environment, drawing from Braungart & McDonough, Cradle to Cradle (C2C)

Contextualizing the Circular Economy

While common use of the term "circular economy" may be relatively new to many, its origins and concepts stretch back to the 1960s. The CE is by no means alone in promoting effective usage, management, and cycling of resources. Multiple other practical concepts sit alongside it, each with their own specific definition and purpose, including blue/green economy, industrial ecology and industrial symbiosis, eco-efficiency, cradle-to-cradle, etc[6].

This abundance of concepts and terminology around similar ideas or sub-components within wider systemic solutions adds complexity. This potentially risks progress being made towards more sustainable consumption and production. Furthermore, the CE concept tends to be set out at a macro-economic level demonstrating the outcome of a whole system (e.g., globe, nation, sector) operating in a circular manner, while in practice we operate in a mostly linear economic model of take-make-discard. To help achieve sustainable development, we must seek opportunities to enable PPP and projects that help transition toward greater circularity. We must also avoid developing barriers that further lock investments and future economic activities into a linear and inefficient disposable approach to resource usage.

The CE is designed to minimize future reliance on the use of virgin/primary material inputs (e.g., metal ores and fossil fuels), thus reducing the negative environmental and social effects often associated with extracting these raw materials. The CE also seeks to avoid inefficiencies generated through the loss of materials from the system through illegal dumping/burning, disposing of waste to landfill, and burning recyclable materials for energy recovery.

As such, there is a need for all professionals, including impact assessors, to be able to contextualize the concept within their own situation, to help catalyze the transition to more circular systems, and to provide future opportunities for enhanced circularity of resource re-usage. In some contexts, this will involve relatively early steps in the maturity journey toward a circular economy—e.g., establishing recycling systems and appropriate waste management, rather than illegal dumping/burning—whereas in other situations more complex interactions between businesses to repair, reuse, and remanufacture materials back into effective use may be more appropriate.

To this end, CE principles are often referred to as a useful tool to help professionals check that they are applying CE concepts in their practice. There are, however, multiple different versions of such principles in circulation within different contexts and sectors, some of more value than others. Section 3 provides further discussion on the relationship between the core skills of IA professionals and key principles for generating organizational progress toward the CE, as defined by the world's first national standard on the Circular Economy, BS8001[7]. These are:

- **Value Optimization**
- **Transparency**
- **Systems Thinking**
- **Stewardship**
- **Collaboration**
- **Innovation**

Progress in transitioning toward circularity

Initiatives related to the CE are underway across the globe, with involvement from multi-national agencies, financial institutions, and companies, through national and local governments, to NGOs, local communities, businesses, and charities.

Increasingly these organizations are seeking to make a connection to the role they will play in helping transition to the CE. Some of these policies, programs, and projects are truly transformative in the way material resources are managed and cycled, while others make far smaller advances to provide core facilities directing waste and materials into a managed system, rather than being dumped in the terrestrial or marine environment. A selection of examples of such CE initiatives across the policy, international finance and city scale can be found in the further reading links set out in Section 6 of this primer.

An early example of a major economy seeking to significantly embrace the circular economy within its national policy approach can be seen in China. The CE was clearly and intentionally embedded in its 11th five-year plan, which became effective back in 2006. It should be recognized that many nations had progressed effective recycling and industrial symbiosis approaches related to specific sectors well before this

date. However, China sought to progress a circular economy emphasis, which it has retained within subsequent plans, and many of the core concepts in its 2006 plan are reflected in CE principles adopted since that date, including those adopted in BS8001, above.

Many other countries have followed China in developing CE-related policies, strategies, road maps, and related legislation, regulations, and guidelines. Notable CE actions and emphasis are being promoted by the European Commission (EC), which published its first Circular Economy Action Plan in 2015 and produced a new Action Plan at the start of 2020 as a key component of the European Green Deal—Europe's agenda for sustainable growth.

The EC's 2020 CE Action Plan[8] includes measures to:

> ***... lead global efforts on circular economy, make circularity work for people, regions and cities, and focus on sectors using the most resources/ where circularity potential is high, e.g. Information and Communications Technology (ICT), batteries & vehicles, packaging, plastics, textiles, construction & buildings; food, water and nutrients.***

Beyond the EU, many nations are developing and progressing CE strategies, with links to a number of these in Section 5: *Further Information*, below. Case studies of Georgia's CE strategy and NGO-led CE actions in Cameroon—as highlighted by experienced IA and CE professionals during the research—are presented as CE case studies A and B within this document.

Circular Economy Standards

Beyond national progress, many institutions and organizations are involved in progressing the CE, including academics and research bodies, none more so, than the Ellen MacArthur Foundation—based on the Isle of Wight in the UK—which has produced leading analysis and reports to highlight the economic and business opportunities, alongside the sustainability benefits of the CE.

This progress, alongside a significant growth in interest in the CE, has led to calls for standardization of the concepts, terminology, approaches, and metrics related to it. Initial actions in this area were progressed by the national standards bodies in both the UK and France, producing the following standards between 2017-18:

- **BS8001:** Framework for implementing the principles of the circular economy in organizations – Guide (BSI, 2017)
- **XP X30-901 - Circular economy:** Circular economy project management system – Requirements and guidelines (AFNOR, 2018)

Although approaching the standardization of CE from different starting points, both provide standardized approaches to applying CE principles, as well as formal processes to test and deliver improved circularity in organizations, projects, products, or services.

The above work, and interest from many other nations' standards bodies, led the International Standards Organization (ISO) to create a new Technical Committee (ISO TC323) on Standardisation in the Circular Economy. With the involvement to date of over 50 standards bodies globally, TC323 is anticipated to launch the first of its standards to shape progress toward CE and circularity in 2022.

SECTION SUMMARY: WHAT IS THE CIRCULAR ECONOMY?

- The circular economy (CE) encompasses a vision and a road map to enable the global economic system to operate within the boundaries of social and environmental limits.
- It requires the transformation of linear take-make-dispose processes to circular resource management systems.
- Technical Committee ISO TC323 is working on Standardisation in the Circular Economy, with input from existing guidance standards, such as the UK's BS8001.
- CE approaches have clear potential to help achieve existing sustainability challenges, such as the Paris Climate Agreement and the UN Sustainable Development Goals (SDGs).

• Photo by Leonid Danilov from Pexels

Building IA professional understanding of the circular economy

IA professionals who engaged with this project requested case studies of integrating the circular economy in IA. Unfortunately, such practice examples are currently limited; however, IA professionals contributing to this project indicated they found this case study useful in building their understanding of issues and concepts related to the circular economy.

Case Study A: National Progress on Circularity in Georgia

Georgia is accelerating efforts towards transitioning to a circular economy (CE), with efforts across government and civil society. Like many nations, it sees increasing consumption and resource use driven by a growth in population and living standards. CE represents a route to efficient green growth, with anticipated environmental, climate, social and economic benefits, and is strongly promoted by the European Commission and growing numbers of nations and cities.

The transition to CE requires whole system support, from enabling technologies and infrastructures to market organization—facilitating value-chain collaboration—and governance and regulation—encouraging companies to make circular production-consumption patterns socially preferable. Like all systemic change, transition requires several elements to change simultaneously, needing concerted stakeholder action.

Georgia is developing a CE Strategy and Road map—a comprehensive approach from multiple perspectives, including production, consumption, waste management, secondary raw materials, innovation, and investments.

One example is introducing extended producer responsibility (EPR) in the national Waste Management Code; a key financial and operational instrument to promote the implementation of waste-hierarchy oriented management schemes and in developing a resource-efficient economy. EPR mobilizes private investment in waste management infrastructure, creating new jobs, by applying the "polluter pays" principle to producers/importers of certain products. Producers then take responsibility for collection, sorting, treatment, and eventual recycling of used goods. EPR is currently limited to waste electric and electronic equipment, used oils, end-of-life tires and vehicles, and waste batteries/accumulators, but will gradually expand.

Such principles are crucial to promoting a mindset shift to recognize waste as a resource and stimulating material reuse, recycling, and recovery value-chains. Georgia's CE actions require wide engagement with stakeholders, international, and local experts, plus support from the EU, USAID, SIDA, and UNDP.

About the Authors

- **Dr. Dariusz Prasek** (Director - Sustainability Advisory Services) is a member of the United Nations Advisory Board on Circular Economy and was formerly Director of Operations & Project Appraisal at the European Bank for Reconstruction and Development (EBRD).
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2. The Circular Economy: Views from IA Professionals

The Research

The authors have long been deeply engaged in both the IA and CE fields, helping draft the first national CE standard and delivering IAIA award-winning practice. As such, the authors have discussed CE and IA for some years with contacts in both fields. The study itself included broad scale questionnaires and focused interviews with several experts, notably:

- **IA: Professor Thomas Fischer** (Liverpool University), **Dr. Elsa João** (Strathclyde University), and **Professor Lone Kornov** (Aalborg University)
- **CE: Dr. Dariusz Prasek** (independent expert and member of UN Advisory Board on CE), **Rusne Sileryte** (University of Delft & Geofluxus)

A desk-based review was also undertaken of the scale of coverage and engagement on CE among the IA community, which found there has been limited discussion of the CE among the IA profession across the last five years, including IAIA conferences and major journals. This included very limited coverage of circular economy/resource management, with limited discussion of waste, much of which was outside of a CE context—i.e., case studies of the IA process of delivering waste infrastructure plans/projects.

Table 1 presents the findings of a review of IAIA conference programs from 2015 to 2019, and session, paper, and poster submissions for the postponed IAIA20. The review looked at three key CE terms—circular economy, resource management, and waste—within the title/abstract of each submission. The findings are not encouraging, and perhaps highlight an opportunity for IAIA HQ, Board, and conference committees to consider new approaches to help ensure there is direct focus and discussion on a selection of key sustainability themes, such as CE, Green Bonds, and other specific global policy agenda trends.

Table 1: Presence of three key CE terms in IAIA conference programs

Year	Occurrences of each term in a CE-related context		
	Circular Economy	Resource Management	Waste
2015	0	0	7
2016	0	1	6
2017	2 (Session + Paper)[9]	0	4
2018	1 (Poster)[10]	0	8
2019	0	0	5
2020	0	0	6 in proposals

A search was also conducted for a range of related terms: Eco-efficiency, Cleaner Production, Blue Economy, Green Economy, Industrial Ecology, Industrial Symbiosis and Cradle-to-Cradle. No coverage of: Eco-efficiency, Cleaner Production, Blue Economy or Cradle-to-Cradle. Industrial Ecology had one paper associated with the term in 2019 ("Interrelationships of environmental assessment and industrial ecology" by Ralf Aschemann). Green Economy was mentioned in a session description in 2015 and within a Special Meeting description in 2018. In addition: Cradle-to-Gate was in one paper description in 2016 and Cradle-to-Grave appeared in a session description in 2019, but none of the paper abstracts clearly included coverage directly related to the CE.

Beyond the interviews and desktop research, SurveyMonkey was used to carry out an online survey in Spring 2020. The survey gathered information on views and awareness of CE across the IA community. The survey was launched to IAIA members and individuals via the association's email mailing list and its online hub—IAIAConnect— and was also promoted directly by the primer's authors via LinkedIn.

In total, 515 responses were received, with the survey questions and summarized results available to download from FothergillTC's website[11], the majority of which came from IA professionals with experience at project scale EIA (71%), with smaller level of response from those with ESIA (33%), SEA (23%) and SIA (18%) experience. Over a third of respondents also indicated they commonly work beyond IA's core disciplines, including taking part in environmental and social management systems (44%) and environment/social audits (35%).

CE Awareness and Association among IA Professionals

Positively, 82% of survey respondents indicated they had heard of the CE. It should be recognized, however, that this was an *opt-in* CE and IA study, so this may be a higher finding than in the global IA community. Even with such a high level of recognition of the term CE, it should be noted that this still means over 1 in 6 IA professionals were not aware of CE concept in spring 2020.

This is a potentially worrying figure considering IA professionals are often key to the environment and sustainability thinking within the heart of plan and project scale decision making around the globe.

Within the survey, a list of terms—with potential connections to the circular economy—were presented with respondents asked to pick any terms they felt had a strong association. Among IA professional respondents who had indicated they were aware of the term CE, **over 50% associated the following words with their understanding of CE:**

- **RE-USE**
- **RECYCLING**
- **RESOURCES**
- **SUSTAINABILITY**
- **WASTE**

Between 30-50% of respondents also associated the following words with their understanding of CE:

- **CIRCULARITY**
- **CLIMATE CHANGE**
- **REDUCE**
- **SYSTEMS THINKING**
- **VALUE OPTIMIZATION**[12]

The open-text written responses across the survey highlighted a range of understanding of the CE concept among IA professionals, with individuals indicating their knowledge ranged from expert level to basic awareness. The findings of a strong association with sustainability, systems thinking, re-use and climate change is positive and may indicate that IA professionals recognize the need for interconnected and collaborative actions to progress toward circularity.

Notably, however, only a quarter of IA professionals associated CE with change management, despite the concept being based on the need to radically disrupt many of the world's existing linear approaches and decision-making mechanisms. This may simply indicate that IA professionals do not consider themselves to be often involved in change management. However, given effective IA practice involves influencing change in plan making and project design, this may highlight that the IA profession should seek a greater role in change management discourse and place more consideration on this activity. This will particularly be the case if IA professionals are to provide an effective contribution to enabling the transition to CE across the polices, plans, and projects they influence in their future work.

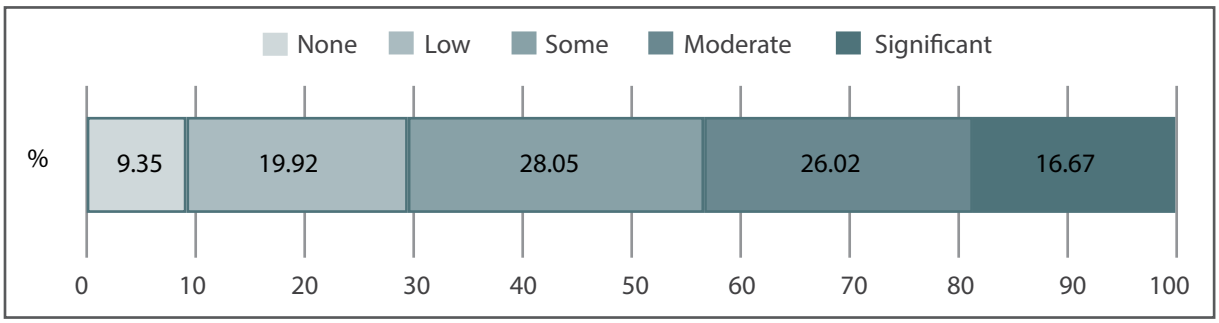
Evidence of Global Interest in the Links between IA & CE

The survey gathered views from professionals based across 83 nations, with IA work experience in all seven continents. Over half of the responses were received from the following ten nations:

[Australia, Canada, Kenya, India, Nigeria, South Africa, Spain, Uganda, United Kingdom and the USA]

The research identified that there is good interest in CE among people that IA professionals work with. See the sub-section below for discussion on which groups the survey found were demonstrating the most interest. Over 70% indicated some, moderate, or significant interest/discussion about the topic, with less than 10% of respondents having seen no interest about CE among their colleagues and clients.

Level of interest in CE among people that IA professionals work with



Broad Scope of Parties Interested in Relationship Between CE and IA

In terms of who is expressing interest in CE, the research found evidence of IA professionals having conversations on the topic with a broad range of sectors, industries, and job roles. Unsurprisingly, the most common response was with other IA, environment, and sustainability professionals; nearly 20% of respondents indicated they had held CE discussions with their IA peers.

Beyond this, approximately 10% of respondents highlighted finding CE interest in their discussions with people in the following sectors:

- Government (national, regional and local)
- Business/industry
- Academic/researchers

Over 25 respondents (~5%) indicated they have had CE discussions with people from each of the following sectors: waste management, banking and finance, and NGOs.

The breadth of interest continued across many different sectors with smaller numbers of respondents highlighting CE interest and discussions with people in:

- Infrastructure, ICT, pharma, chemicals, oil and gas, manufacturing, energy production, construction, mining, and assessment management

The research also found that CE interest is not limited to the environment and sustainability professionals within these industries, with IA professionals indicating they had held such discussions with:

- Business strategists, communication professionals, lawyers, economists, entrepreneurs, supply-chain actors, planners, architects, facilities managers, H&S professionals, business development, managers, procurement, contractors, and designers

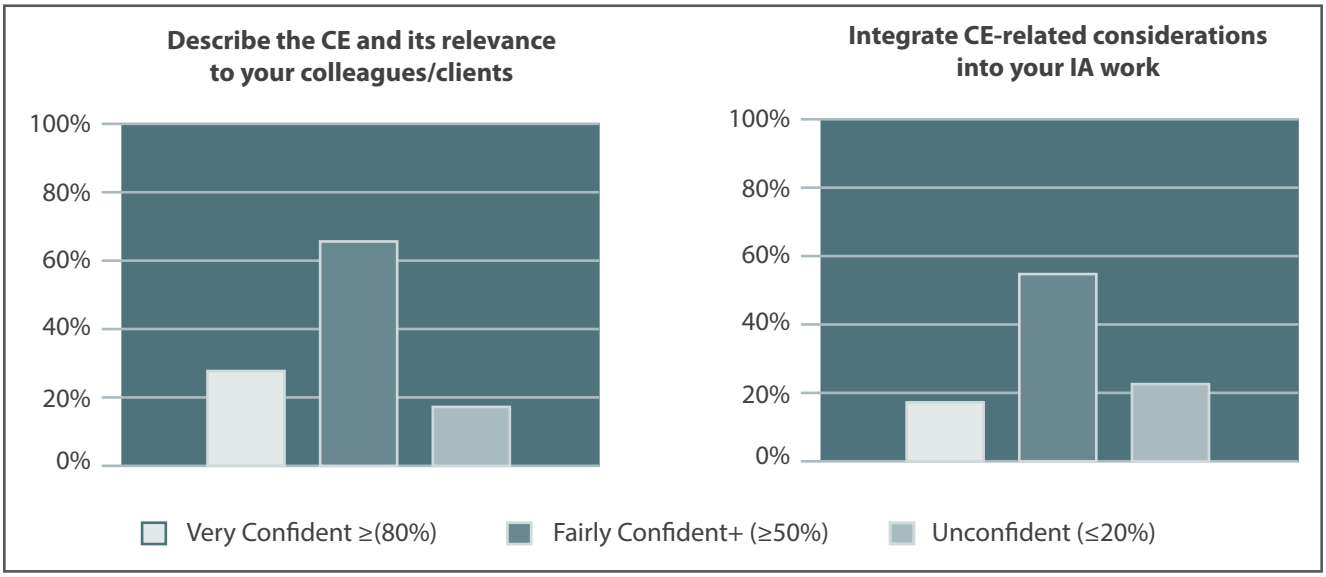
It is clear from this study that the global IA community is beginning to identify a broad interest in enabling real-world progress toward circularity, beyond a macro-economic concept. It is, however, also fair to say that CE is not yet generating the same degree of conversations in the IA community—e.g., conference papers, journal articles, and guidance—when compared to major sustainability challenges, such as climate change and biodiversity loss, or core sustainability initiatives such as the UN's SDGs.

Impact Assessor Confidence in engaging with CE

In terms of the confidence of IA professionals to discuss CE and integrate it into their practices there are positive findings, given the limited direct coverage of circularity and related issues in relevant journals and at the IAIA conference. As can be seen in the graphs below, a majority of IA professionals indicated they have at least a fair degree of confidence that they can both describe the relevance of CE to colleagues/clients and integrate considerations related to it within their IA work.

What is also clear from practitioner comments received within the survey, however, is that a significant minority of IA professionals remain unclear of what CE is. Further to this, there is notably less confidence among IA professionals in how to integrate CE considerations into IA practice, with nearly two thirds of respondents seeking CE case studies relevant to IA.

Confidence of IA professionals to…



SECTION SUMMARY: THE CIRCULAR ECONOMY – VIEWS FROM IA PROFESSIONALS

- The majority of IA professionals who engaged with the research are aware of the CE and recognize that it goes beyond traditional concepts of waste management and recycling to encompass wider sustainability ambitions related to resource management and the need to consider issues at a systems level.
- The study found interest from across the globe in better understanding IA's role in enabling the CE's, with evidence of IA professionals discussing the subject with colleagues, clients, and contacts across many different disciplines and sectors.
- There are currently limited IA related resources available related to the CE, from conference sessions and papers, through published journals and wider practice literature.
- Of the 500+ IA professionals that engaged with the study most (68%) are reasonably confident they can explain the CE's relevance to others, but practitioners are less confident about how to integrate circularity in practice, with a strong desire for greater sharing of more case examples.

Photo by Nibret Sanga from Pexels

Building IA professional understanding of the Circular Economy

IA professionals who engaged with this project requested case studies of integrating the circular economy in IA. Unfortunately, such practice examples are currently limited; however, IA professionals contributing to this project indicated they had found this case study useful in building their understanding of issues and concepts related to the circular economy.

Case Study B: Municipal Solid Waste Management in Douala, Cameroon

Like in many cities, solid waste management is a significant issue in Douala, Cameroon, where over three-quarters of the population in Municipality IV are poorly served by municipal refuse provision. Beyond the environmental and health challenges this generates, potential economic benefits are missed, with an estimated 10 tons of non-hazardous glass and 20 tons of plastic waste produced daily. Additionally, biodegradable waste is lost and with it the potential for composting regenerate fertility back into local sandy soils to support agriculture. The separation and effective use of these waste streams could drive environmental and social benefits, while reducing waste disposal costs and enhancing the lifespan of related infrastructure.

In response to these challenges, Environmental Defence and Consumer Interest Forum (EDCIF) implemented a solid waste minimization and valorization project, supported by UNDP-GEF funding. EDCIF, an NGO, worked with stakeholders including Douala IV Urban Council and traditional authorities to gain trust and then deliver the transportation, sorting, and (temporary) storage of waste and the sale / exchange of household consumables and recycling of glass & plastics.

EDCIF established 20 collection points across five poorly served, low-income neighborhoods, with recyclable plastic and glass separated and organic matter collected for future composting. This generated increased recycling and generated work for youth and women – in waste collection and sorting – and is expected to reduce municipal waste disposal by 30% while helping to curb uncontrolled plastic burning.

The result is that previous 'waste' is now streamed by category and quality, generating a market for recovered material to be sold to recycling facilities. Wider benefits have seen reduced litter in the area and increased discussion of environmental issues in schools.

The project's initial challenges were obtaining stakeholder approval and changing behaviors, both of which were critical to its success. However, the project's success—in raising awareness of the potential value of waste—may bring challenges in maintaining free access to the collection of this resource.

While Douala's waste management problems are far from solved, EDCIF project provides an example of how localized initiatives help to transition mindsets towards CE approaches, while demonstrating the potential for circularity to drive social, economic and environmental benefit.

Additional Information:

This case study was recommended by IAIA member **Chi Napoleon Forpah** (Coordinator Watershed Task Group, Cameroon), who was the project's technical adviser and the Founding Secretary of EDCIF.

Further details on the origins and background to this case study can be found in *Practices in the Sound Management of Chemicals* (UNEP, 2010)[13]

3. Impact Assessment and the Circular Economy

There are clear links between aspects within a transition to a CE and current IA practice, with most IA processes expecting a consideration of the use resources and the disposal of waste and management of pollutants (See **Box 1**). In most legislative contexts, the IA process is expected to look beyond direct effects to the more complex indirect, cumulative, and synergistic consequences of policies, plans, and programs. This area, perhaps more than any other, highlights a significant potential for IA to act as both an enabler and assessor of CE initiatives, which are often strongly linked to understanding interactions resulting from proposed changes in complex systems.

Beyond national legislation, another key area of IA application is the risk management process within international finance. There is considerable interest in CE among FIs—with growing coverage on organizational websites and evidence of co-operation to develop reports and guides on financing CE initiatives—see *Further Reading* (Section 6). However, it is far less easy to identify FI content that links CE directly with the application of environmental and social impact assessment (ESIA). It is clear, however, that within the detail of these policies, particularly the expectations around mitigation, that initial connections between ESIA and CE could be easily achieved. For example: the World Bank's Environmental and Health and Safety guidelines on waste, which are also used by other FIs, promote the "*Evaluation of waste production processes and identification of potentially recyclable materials · Identification and recycling of products that can be reintroduced into the manufacturing process or industry activity at the site*."

There are, therefore, existing opportunities for IA professionals who are working with FIs to explore the use of the existing mitigation hierarchy principle to bring in CE concepts and approaches that link to the opportunity to avoid impacts, avoid waste, and prevent pollution. The principle of the mitigation hierarchy could be used by FIs and their IA practitioners to introduce re-use of materials into the discussion, or the potential for circular design alternatives, which may challenge the long-term value of existing best available technologies (BAT).

In terms of CE within FI environmental and social policy, the clearest example, identified by this study, is contained within the European Bank for Reconstruction and Development's (EBRD) 2019 update to its E&S Policies. These policies are intended to shape the bank's application of ESIA and Environmental and Social Management Systems.

EBRD Performance Requirement 3 (Resource Efficiency and Pollution Prevention and Control) now makes explicit reference to the CE:

"This PR also recognizes the emerging concept and practice of Circular Economy and or resources recovery where usable and valuable products can be created or derived from what has been previously viewed as waste."[14]

Unfortunately, the EBRD does not take PR3 further, to cover detail on how the CE should be considered in the application of ESIA, but it does provide the context for such work to be undertaken by its staff and those working under its requirements.

The EBRD, like many FIs, has a growing number of examples of investments and finance for projects that will help enable the CE, such as the *Turkey Materials Marketplace*[15]. This project aims to create a closed-loop, collaborative network of businesses and entrepreneurs where one organization's hard-to-recycle waste and

by-products becomes another organization's raw material. In addition to diverting waste from landfills, the marketplace's recovery activities will generate significant cost savings and energy savings while creating new jobs and business opportunities, much of which would have been captured in the investment's ESIA documentation.

The growing interest in CE, and potential for alignment with IA processes, makes the need for further investigation and activity in this area by impact assessors a priority. This Section presents a brief review of:

- Alignment between key skills of IA professionals and core principles for making organizational progress toward the CE.
- How CE and IA alignment can be linked to progressing the UN's Sustainable Development Goals (SDGs).

CE Principles and IA Skills: A Beneficial Alignment

At a practical level, implementing CE-oriented initiatives means organizations and individuals taking a more systems-based[16] approach to the policies, plans and projects they are developing. The intended result is to generate more value through the sustainable on-going management and re-use of resources, rather than through wasteful linear approaches.

IA professionals are not only already well placed in relevant decision-making processes, but also have many of the skills needed to help apply a CE approach/mindset to the development of policies, plans, and projects.

But what does a CE mindset/approach look like and how can it be defined?

This primer has adopted the approach set out within the first national standard on CE, BS8001. This British Standard defines **six principles that organizations need** to enable them to make effective progress toward circularity.

They are:

- **Value optimization:** Keeping all products, components, and materials at their highest value and utility at all times.
- **Transparency:** Openness about decisions and activities that affect the ability to transition to a more circular and sustainable mode of operation and willingness to clearly, accurately, and honestly communicate these.
- **Systems thinking:** Taking a holistic approach to understand how individual decisions and activities interact within the wider systems they are part of.
- **Stewardship:** Managing the direct and indirect impacts of their decisions and activities within the wider systems they are part of.
- **Collaboration:** Collaborating internally and externally through formal and/or informal arrangements to create mutual value.
- **Innovation:** Continually innovating to create value by enabling the sustainable management of resources through the design of processes, products/services and business models.

[Adapted from BS8001: Framework for implementing the principles of the circular economy in organizations – Guide (BSI, 2017)]

Aligning professional IA skills with these CE Principles:

- **Value optimization**

  While value optimization immediately raises for which party is value being optimized, the CE principles need to be considered both individually and as a whole. There is little doubt that the impact assessor's role is to take a wide view in order to optimize the development of a plan or program toward improved environment and social value.

  Beyond this, there is undoubtedly resonance between the five other principles that are core to driving a CE mindset and those that IA professionals are expected to exhibit.

- **Transparency**

  Acting transparently is key to success in all sustainability disciplines, including IA practice. Many IA professionals work within a code of practice that expects integrity, honesty, openness, and an avoidance of misrepresentation or deliberate bias. In fact, the IAIA's own code of practice includes the above elements in the expectations it places on professional IA members.

- **Stewardship and systems thinking**

  IAIA's 2010 *Guideline Standards for IA Professionals*[17] highlights the need for impact assessors to have capabilities to understand IA methods related to both strategic assessment and cumulative effects and go on to include expectations of capability related to sustainable development. These two elements of core IA professional competency have close alignment to concept set out within the *systems thinking* and *stewardship* principles in BS8001. In fact, it was only after the consultation process on a draft version of BS8001 that the term "stewardship" was introduced to replace the original proposed wording of a CE mindset principle on *sustainability*.

- **Collaboration**

  Beyond this alignment with IA codes of practice and guidelines, impact assessors have to be able to effectively work with multiple different actors—from discussions with engineers/plan makers, through senior officials and community stakeholders, to technical environmental/ social specialists. As such, being an effective communicator, or having the capability to manage engagement across multiple stakeholders, is fundamental to an IA professional's skill set. This bears a close alignment to the CE principle termed "collaboration"—the need to be able to identify and work positively with many different parties to ultimately deliver improved environmental and social performance. Increasingly, ISO 44000:2019[18] (principles for successful collaborative business relationship management) is being adopted to support this.

- **Innovation**

  It is often through engagement and collaboration that the IA professional develops solutions to the often inter-related environmental and social impacts predicted to result from a developing plan or project. This IA role in seeking to either modifying existing plans/design or develop flexible mitigation that to be implemented during construction/operation drives an often-innovative approach, which again ties well with the final core concept in the CE mindset—*innovation*. Initiatives that draw together impact assessors and CE drivers to innovate and collaborate across the infrastructure development industry are increasingly found in many nations. For example, in the UK such activities can be seen in the work of I3P.org.uk and the AECOM-founded Major Infrastructure Resource Optimisation Group (MI-ROG)[19].

In many ways the IA profession is arguably pre-packaged to adapt its role to accommodate CE principles and a circularity mindset into the plans and projects they are employed to assess. The evidence from practitioners (see Section 2) may indicate that the profession needs a little more understanding and case examples to help enable this, but the potential for IA to help enable greater consideration of circularity in the processes it is applied to is certainly there.

The SDGs, Circular Economy, and Impact Assessment

In 2015, the UN General Assembly adopted "Transforming our world: The 2030 Agenda for Sustainable Development[20]," which contains the 17 SDGs and related targets and indicators. The SDGs provide the context for global- to local-level planning and actions related to sustainability and the basis for related performance monitoring and evaluation across all sectors.

The SDGs are intended to be progressed in unison and, when reviewed in relation to a project, plan, or policy, there are multiple linkages between the opportunities and risks across different goals. However, not all SDGs will be as relevant in all settings and in their application and it is therefore important to "*Avoid being overly rigid or overly prescriptive: not all SDG targets are relevant to all contexts*" (Partidario and Verheem, 2019)[21].

While the UN 2030 Agenda and its SDGs do not use the same terminology as the CE, nor make direct reference to it, the two agendas are still well aligned and can work together to accelerate progress toward sustainability. The most obvious link between the SDGs and CE is through Goal 12—*Responsible Consumption and Production*—however, there are far broader links than this. A study, published in the *Journal of Industrial Ecology* in 2019, conducted a literature review and analysis to determine the relationship between CE practices and SDG targets[22].

The study found the strongest links with goals 6, 7, 8, 12, and 15 (Clean Water and Sanitation, Affordable and Clean Energy, Decent Work and Economic Growth, Responsible Consumption and Production, and Life on Land). It also identified direct links to 21 of the SDG targets with indirect links to a further 28 targets, a total of nearly a third of all the goals' targets. Beyond this, the study found that the application of CE approaches and practices often offers opportunities to create synergies between several SDGs to help drive multiple benefits. The paper highlights gaps in the published literature in exploring the links between CE and Good Health and Well-Being and Gender Equality (SDGs 3 and 5). This gap has also been recognized by the World Health Organization (WHO), who have begun to undertake analysis in this area, including a 2018 report on CE & Health: Risks and Opportunities. The WHO's work is discussed further in Section 4—*IA's role in understanding the impacts of transitioning to circularity*, below.

As such, it is not just academics who recognize the connections between CE and the 2030 goals. From the CE perspective, the respected Ellen MacArthur Foundation has noted since the introduction of the 2030 goals that "*the concept of CE… provides much promise to accelerate implementation of the 2030 agenda*"[23]. Within the SDG community, a joint meeting of the Economic and Financial (second Committee) of the 73rd UN General Assembly and the UN Economic and Social Council was held in October 2018[24], with various for-runner events held and activities undertaken before it.

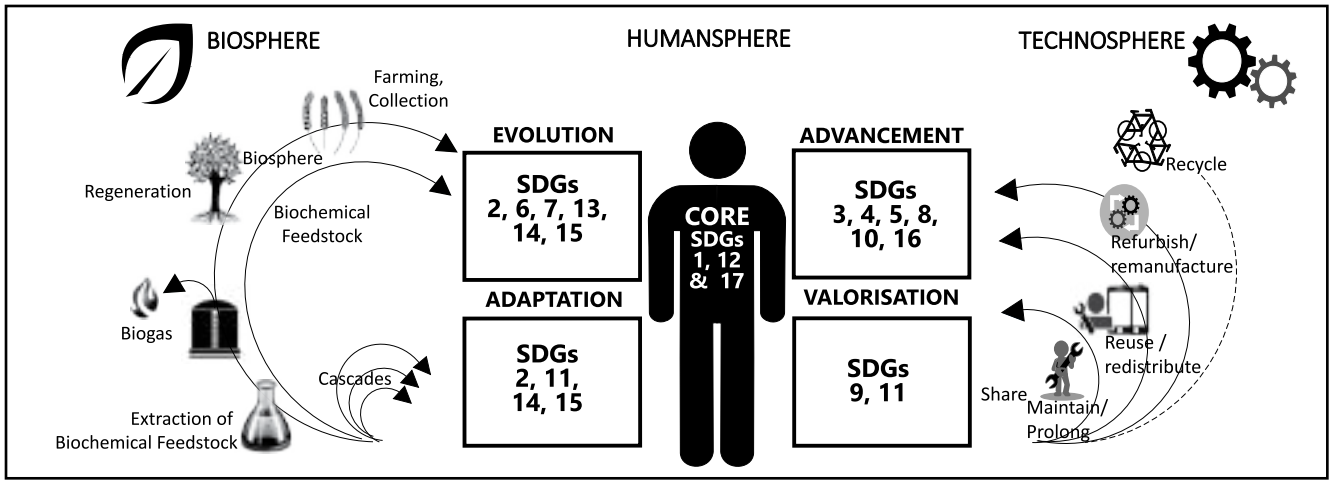
The UN's October 2018 meeting aimed to provide a deeper understanding of the CE and how it can be leveraged to achieve the SDGs. The outcomes of the meeting identified that there is strong synergy in the concepts between CE and the SDG agenda. It was recognized that both approaches identify the need for a "*systems view*" and that the efforts required to deliver sustainable development are interconnected and often transboundary in nature. Additionally, both have a strong emphasis on the need to engage and deliver progress through collaboration and partnership efforts.

In preparation for the above, an expert group of the UN's Department of Economic and Social Affairs—within its Division for Sustainable Development[25]—indicated in May 2018 that SDG12 "*is in many ways a*

microcosm of Agenda 2030." This is because Responsible Consumption and Production provides a "useful lens" to identify entry points for interventions that address both SDG and climate goals, and that activities and initiatives to enable this goal often generate co-benefits to the wider goals.

Box 2 below provides a conceptual alignment of the CE aspects of the Ellen MacArthur Foundation CE "Butterfly Diagram' (see **Box 1**) with the UN's 17 SDGs, to highlight the relationship and areas of alignment that demonstrate the areas of mindset shift needed to deliver a sustainable future.

Box 2: Concept diagram of the links between CE and the SDGs



After A. Lemille[26], adapted from Ellen MacArthur Foundation "Butterfly Diagram"[27]

Having established clear and strong linkages between the SDGs and the CE, understanding the potential role IA can play across this area requires consideration. The relationship between IA and the CE has been established in the first half of Section 3, above, with the role for IA in enabling the CE is explored in Section 4, below. However, the established relationship between IA and the SDGs is worth considering here to demonstrate the connection between all three elements.

The role of IA in enabling the SDGs has been explored by several parties, not least at IAIA's annual conferences[28] and multiple regional IA conferences around the world, since their launch in 2015. A key publication to help guide impact assessors thinking in this area is the 2019 IAIA FasTips co-authored by Maria Partidario and Rob Verheem and is recommended to readers as a key starting text in exploring the SDGs through an IA lens[29].

While not seeking to repeat the useful advice in the above publication, the authors highlight a key advantage that IA offers in advancing SDG integration into policy, plan, and project development: the tool already exists as an accepted part of these processes across much of the world.

Further to this, the 2017 Minsk Declaration—the outcome of a meeting of the parties of the Espoo Convention (Trans-boundary EIA) and Kiev Protocol (SEA)—recognized the important role EIA, SEA, and related IA tools can play in achieving the SDGs. The Minsk declaration states that:

> ***"... the Convention and in particular the Protocol play an important role in supporting countries to translate international principles and global commitments for the protection of the environment and sustainable development into practical action at the national level and thus contribute to the achievement of the Sustainable Development Goals[30]."***

The parties also noted that through uptake of the SDGs and recognition of the inter-connectedness of the sustainability challenges they respond to, nations and international bodies may in turn improve their application of IA and as a result enhance the effective application of the Espoo Convention and the Kiev Protocol.

The research interviews highlighted concerns that some actors may seek to use the CE agenda/ emphasize the *consumption and production* aspects of SDG12 to seek to exploit potential tensions between environmental protection, economic growth, and social welfare, in order to maintain the unsustainable status quo. To avoid this there is a need to recognize the transboundary nature of many sustainability impacts related to current patterns of consumption and production[31]. This is addressed in part by taking a *systems perspective*, an approach that is core to both the CE and SDGs. The implications of this in relation to IA practice are explored further in Section 4's *CE Primer Messages* below.

As such, it may be the case that the IA profession needs to place greater emphasis on IA's application in contexts where systemic changes can be delivered—this is more likely to occur achieved through strategic application of IA (e.g., SEA/sustainability assessment) rather than within project IA. However, even at the project level, future IA practice may need to place more emphasis on considering wider value-chain issues such as materials sourcing and the potential for reuse of materials than accepting the answer that "waste" will be managed by appropriate local waste management providers.

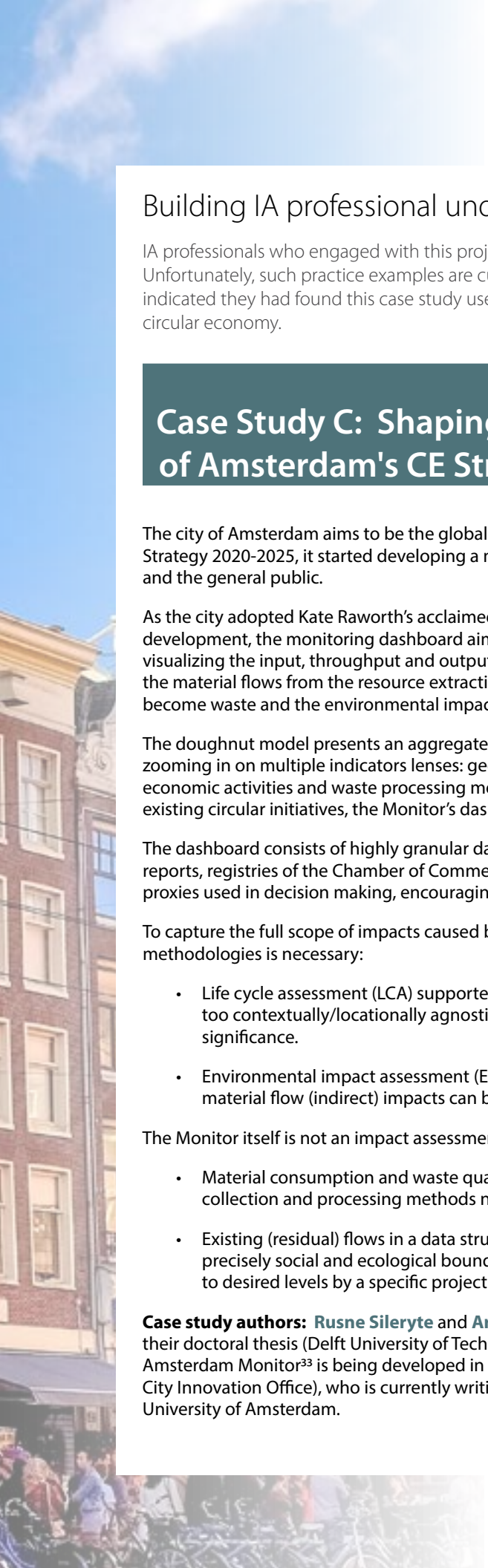
The potential role IA approaches can play in establishing a CE strategy is discussed in *CE case study 3*, with a number of these issues raised above considered further in Section 4, below—T*he role of EIA in enabling the CE*.

SECTION SUMMARY: IMPACT ASSESSMENT AND THE CIRCULAR ECONOMY

- The majority of legislative (/FI policy)-required IA already expects the process to consider effects related to the use resources and management of waste and generation of pollutants, providing a potential avenue to bring wider CE issues into plan and project decision making across the globe.
- Growing national interest in CE initiatives and related investments by FIs makes the need for further activity by the IA profession a priority, to ensure that assessment processes are able to capture circularity opportunities and effects.
- The skill set required to be an effective IA professional demonstrates good alignment with principles associated with applying a CE mindset to planning and decision making, including taking a broader view of value, enabling information sharing and collaboration, and taking a wider systems view to identify indirect and cumulative effects.
- Moving toward a CE can help deliver upon the UN SDGs, and vice versa, with progress in both areas requiring greater consideration of a systems perspective; as such, emphasizing the need for the application of IA in such contexts (e.g., policy and plan scale) will be increasingly important.

Image by Gerd Altmann from Pixabay


Hotel Damrak Inn
VLAAMSE FRITES
Opening soon



Building IA professional understanding of the Circular Economy

IA professionals who engaged with this project requested case studies of integrating the circular economy in IA. Unfortunately, such practice examples are currently limited; however, IA professionals contributing to this project indicated they had found this case study useful in building their understanding of issues and concepts related to the circular economy.

Case Study C: Shaping and Assessing the Development of Amsterdam's CE Strategy

The city of Amsterdam aims to be the global forerunner in the transition toward a CE. In 2019, as part of its Circular Strategy 2020-2025, it started developing a monitoring dashboard: a web application accessible for both policy makers and the general public.

As the city adopted Kate Raworth's acclaimed "doughnut economy model"[32] as its main vision for sustainable development, the monitoring dashboard aims to effectively measure the impact of the city of Amsterdam by visualizing the input, throughput and output of material streams of the city. The monitoring dashboard zooms in on the material flows from the resource extraction to meet the city's consumption, to all residual flows of materials that become waste and the environmental impacts they cause both locally as globally.

The doughnut model presents an aggregated image of how far the city is from its targets, but the Monitor allows zooming in on multiple indicators lenses: geospatial, temporal, materials, and the contribution of both different economic activities and waste processing methods. Instead of only emphasizing positive change and presenting existing circular initiatives, the Monitor's dashboard helps ask "what still needs to be solved."

The dashboard consists of highly granular data, combined from different governmental sources (industrial waste reports, registries of the Chamber of Commerce, international trade data, etc.). It also exposes existing data gaps and proxies used in decision making, encouraging its users to contribute higher quality data.

To capture the full scope of impacts caused by changes in material flows, a combination of impact assessment methodologies is necessary:

- Life cycle assessment (LCA) supported by a material flow assessment (MFA)—the standard approach risks being too contextually/locationally agnostic, thus lacking key social and ecological variations that influence impact significance.
- Environmental impact assessment (EIA) enables this specific site definition, but this tends to mean wider material flow (indirect) impacts can be missed.

The Monitor itself is not an impact assessment tool; however, it provides information to support both methods:

- Material consumption and waste quantities and known site-specific emission factors related to waste collection and processing methods necessary for LCA inventories.
- Existing (residual) flows in a data structure that enables project and plan-level IA to rapidly identify where precisely social and ecological boundaries have already been crossed, and the change to contribute to return to desired levels by a specific project in a specific site.

Case study authors: **Rusne Sileryte** and **Arnout Sabbe** developed the waste mapping part of the Monitor as part of their doctoral thesis (Delft University of Technology). They now run a spin-off on an open-source project (geoFluxus). Amsterdam Monitor[33] is being developed in close collaboration with **Juan-Carlos Goilo** (Project Leader - Amsterdam City Innovation Office), who is currently writing his doctoral thesis on the conceptual framework of monitors at the University of Amsterdam.

4. The Role of Impact Assessment in Enabling the Circular Economy

This primer does not seek to provide detailed guidance on integrating CE into IA activities—although the research found that practitioners would value such a guide as experience grows around consideration of CE within IA. Through the experience of the authors and research interviews conducted, it has been possible to identify that IA has two clear roles that it can play to help enable circularity at policy, plan, and project scale. The following section therefore considers:

- The role IA can play in considering the potential progress toward CE offered by the policies/plans/projects being assessed.
- The role IA can play in helping decision makers and stakeholders understand the environmental and social consequences of planned CE initiatives.

Integrating CE within IA Approaches

While assessing the potential consequences of a policy, plan, or project on progressing the CE is not currently explicitly required by many example pieces of IA legislation, or the environment and social policies of the main FIs, this does not give the IA profession an excuse to ignore it. Further, IA practice should not limit its consideration of CE to the assessment of plans/projects related to the extractives and waste management industries. While a key goal of the CE is to minimize the need for inputs of virgin materials and avoid the disposal of waste, the move toward circularity encompasses all sectors and activities.

IA is intended to both identify the future consequences of a current or proposed action and help contribute to sustainable development. As such, IA professionals have a duty to use their knowledge and expertise to help decision makers and stakeholders understand the anticipated outcomes of an action, including whether the plan/project being considered will act to enable or compromise future progress toward the CE. Section 3 provides further details on links between IA professional skills and CE principles.

The primer's authors have used the research and their knowledge and experience to develop a series of key messages, intended to assist the IA community in advancing CE considerations within their future work.

The ***CE Primer Messages***[34] are:

A. Impact assessors should be proactive in helping engage the development of policies, plans, and projects with relevant aspects of the CE and appropriate circularity opportunities.

B. To effectively assess a plan/project's CE opportunities and consequences, IA practices may need to adopt a broader systems perspective, including more consideration of transboundary impacts related to material flows along likely value chains.

C. Strategic IA (e.g., Strategic Environmental assessment/Sustainability Assessment) provides impact assessors with greater opportunities to enable circularity progress.

D. Project-level IA should not ignore the CE but may need to make a case for its consideration from topics within existing legislation/policy (e.g., waste, resources).

E. Consideration of CE risks and opportunities within IA may require this aspect of assessment to move away from traditional significance evaluation to instead consider whether a proposed action will enable/disable progress toward circularity.

A. IA proactively engaging plans and projects with relevant aspects of the CE

consideration to the need for and use of materials and subsequent materials management once they become waste. The first step for the impact assessor is therefore to ascertain the extent to which CE, or concepts closely related to it, are already being considered in the policy, plan, or project's development.

Where some aspect of resource use or CE is already being considered within the PPP development, the IA professional should form a key part of the collaborative team working on embedding the CE opportunities. Through this work, the IA professional can help the team better understand CE and maximize the potential of the PPP to deliver circular outcomes. At a more basic level, this could be done by providing advice on the impacts of various options or choices, suggesting alternatives, bringing different partners together to develop innovative solutions, and highlighting the long-term and wider consequences of different approaches to the solution.

Where circularity (/sustainable use of resources) is not on the agenda, impact assessors should feel a professional responsibility to bring up CE and seek to engage decision makers in a discussion of its relevance to the project. The IA professional should find suitable ways to communicate relevant circularity issues to the wider team to help better engage the plan/project with circularity risks and opportunities. A simple starting point could be to include the ambition to contribute towards a circular economy within the PPP's objectives.

In all cases, IA professionals should be on the lookout for situations within the plan/project where current/future activities risk locking in existing linear approaches to resource use. Such activities often have a twofold impact:

- Generating the need for other parties to manage the disposal of materials, which may lead to indirect adverse social and environmental consequences beyond the plan/project's boundaries,
- By failing to consider CE in policy/plan/project design, materials may not be able to be reused in the future and unsustainable (linear) activities and behaviors may be "locked in," making

B. Adopting a broader systems perspective within IA

The transition from a generally linear use of resources to an approach that inherently reuses and cycles materials within the system requires a systemwide application across IA practice. For IA to assess the CE opportunities and consequences of a policy, plan, or project it will need to place greater emphasis on practices that take account of this broader systems perspective.

Virtually all IA legislation and policy requires the consideration of impacts beyond the plan/project boundary, including wider indirect and cumulative effects. In some circumstances, the IA process is also expected to consider *transboundary impacts* as set out in the ESPOO Convention. All these methods provide a potential avenue for IA to adopt greater consideration of CE. However, up to now, IA's focus on the significance of issues to the project or plan's context, rather than giving some consideration to whether the result optimizes value effectively at a more systemic scale, has tended to mean IA fails to place emphasis of a broader lifecycle perspective/significance.

This is an area that IA has had to address in its consideration of greenhouse gas emissions and is touched on in some areas of the assessment of cumulative and synergistic effects. The consideration of a wider system boundary to the assessment and the evaluation of resource/material flows along likely value chains may need to be given greater consideration in future IAs to enable more effective consideration of circularity issues. This is an area of IA practice that requires greater discussion to ensure IA can play its role in enabling the CE and the shift to sustainable development.

C. Strategic IA's potential to progress circularity

In most situations, the application of IA tools within strategic decision making (e.g., strategic environmental assessment (SEA)) presents a greater opportunity to enable progress toward the CE, when compared with IA's application to individual projects.

Making progress toward the CE involves enhancing the circularity of systems, rather than being limited to individual projects/plans; however, the broader scale of plan making offers greater opportunity to influence such systemic change. One way to consider progress toward the CE is to apply a lifecycle approach, which could simply involve applying lifecycle thinking, or extend as far as a formal life cycle analysis (LCA). For example, by considering the life cycle of nuclear energy production, it may be the case that the environmental and social impacts of sourcing and disposing of fuel pose significantly greater impacts than the actual siting and development of a new facility.

Currently, lifecycle thinking and the consideration of materials flows and return to effective use is not regularly applied within IA. However, the broader boundaries of plan-level SEA provide an opportunity to assess and influence some of these areas, when compared to the often-limited range of options available for the IA process to influence at the project scale (e.g., design iterations, site access routes, etc.).

Strategic IA processes have the potential to place greater emphasis on understanding lifecycle risks and material flows both within, and in some cases beyond, the plan's boundary. The introduction of lifecycle screening approaches at an early stage within a plan-making process can help to slant a plan's development toward a broader optimization of value that considers the embedded environmental social consequences (including sourcing, extraction, production, transportation, storage, removal, and disposal) associated with the selection of different solutions.

At the simplest level, this could focus on screening based on a small selection of "critical" issues (e.g., greenhouse gas emissions, reducing material use, etc.), or be more comprehensive through the consideration of multiple environmental and social issues across the lifecycle. CE case study C provides an example of an approach that combined elements of material flow analysis, lifecycle assessment, and IA to shape the development of Amsterdam's CE Strategy.

The challenge of taking a more complex approach is that more data will be needed to determine lifecycle risks without excessive uncertainties arising. This presents challenges, as quality data may not be available in all contexts. As such, early consideration of data needs associated with any SEA lifecycle screening indicators will be a key aspect of determining whether to apply such an assessment.

Another key issue—to both access data and enable effective consideration of CE at the strategic scale—is establishing relationships with and between stakeholders. IA can help drive such engagement and develop the relationships to help the plan-making process look beyond itself and seek to influence wider circularity changes within a system. SEA practitioners should therefore seek to create (/catalyze) ownership of multi-party efforts and initiatives toward circularity, especially within the plan's boundaries, by highlighting CE priorities and issues during stakeholder engagement. This may require more stakeholder dialogue than is common in standard IA practice, meaning the IA professional takes a greater role in identifying and facilitating partnerships that help align lifecycle opportunities related to the plan's potential to enable circularity progress.

D. Project-level IA should not ignore the CE

Apart from in a small number of projects that have already embraced sustainability issues within the design and development process, progressing toward CE is unlikely to be in the primary scope of an IA. As such, IA professionals are likely to be in a position where they must "make the case" for considering CE, or issues relevant to progressing opportunities for circularity.

In most cases, this will be best approached by justifying how CE-related issues are relevant to the project's effects through links to existing issues within the national legislation, or FIs' environmental and social policies/requirements. It is for the IA professional to determine how best to make and communicate this case, but it could be linked to the need to consider resource use, management of material assets, the need to manage pollution/ waste, or the consideration of indirect/cumulative effects. A recent IEMA publication on considering materials assets—a topic within the legislative scope of the European Union EIA Directive (2011/52/ EU, as amended)—for example indicates:

> *"The EIA process should seek to deliver outcomes that align with the highest tiers of the Waste Hierarchy, and the Proximity Principle, and should be used to encourage and evidence transitions towards a Circular Economy."*

[IEMA's *Guide to Materials and waste in EIA* (Danson, et al., 2020)[35]]

EIA and ESIA practitioners seeking to progress the CE potential of their projects should therefore keep up to date not only with progress related to CE in IA, but also developments in other areas related to how IA can enhance its role in understanding effects across developmental lifecycles (e.g., lifecycle assessment, waste management, building information modeling, (BIM), etc.).

The assessment of circularity issues could include consideration of:

- Development design issues to minimize need for materials and maximize use of secondary/recycled materials.
- Materials usage by the project (e.g., distance of source from site, sustainability of materials required/ specified, volume of material required.
- Management of materials on site (e.g., storage—location, spill/ spoilage protection, re-use/recycling provisions, management of wastes).

It should be noted, however, that some regulatory/ policy requirements designed to reduce environmental/social effects may work against CE progress. This is because the regulatory regime is set up to manage the negative impacts of the linear approach to resource use, which could unintentionally act as a blocker to progress toward the circular use of resources. For example, the application of some BAT methodologies and technologies that are optimized to deliver effective pollution prevention do not take account of the potential to seek to capture and reuse valuable untapped resources within air/water emissions. Thus, in some cases definitions of BAT may risk preventing new/innovative techniques being explored that recognize the value of rare earth metals in emissions and waste materials and seek to optimize value by both preventing pollution and enabling valuable resources to be extracted.

IA professionals, working in step with their project development team, may need to challenge BAT (/ equivalent) requirements, in order to make the case for accepting more circular approaches to be accepted. It should be noted that solutions that promote circularity will not always prove to be the most effective or may not be accepted by the plan/ project. This, however, should not mean impact assessors avoid their identification or promotion. The sharing of successes and failures in making the case for circularity progress through IA will be an essential element of making IA a valuable tool in the transition toward a CE.

E. Assessing CE risks and opportunities in IA may require a shift in significance evaluation

LCA and footprinting tools[36] can produce absolute and comparative quantified environmental performance findings. However, they tend to require a lot of data and the quantified approach applied can prove harder for some stakeholders to engage with, when compared to qualitative approaches where issues are more tangibly presented. One of the many benefits of IA is that it often brings a broad range of environmental and social specialists into the plan/project development team and help consider the holistic interaction of the proposal across multiple areas.

While the enhanced consideration of CE within plan making and project design may increasingly bring IA and lifecycle approaches together, at this time examples of such truly combined approaches are limited. As such, the scope of an IA's consideration of CE is initially likely to focus on whether and how a plan/project's actions will enhance or detract from opportunities to drive greater circularity. This is likely to be undertaken using the professional judgment of impact assessors applying a mix of qualitative and quantitative evidence.

The systemic nature of circularity issues, and the uncertainties that are likely to be present in seeking to look beyond the traditional scope of IA to apply a greater lifecycle perspective, means that the definition of a scale/threshold of significance effect is likely to prove complex. Further, at this early stage in the maturity of practice, aiming to attribute such significance findings may be misleading. It may, therefore, be sufficient for the IA process to identify which aspects of a plan/project are best suited to help enable circularity and which elements risk disabling such progress/locking in linear use of virgin resources and the need to dispose of large volumes of waste.

IA's role in understanding the impacts of transitioning to circularity

While the CE provides a destination for sustainable development and shifting toward circularity should enable and increase restorative and regenerative cycles within natural and societal systems, this does not mean its delivery is risk-free. Unintended environmental and social consequences are inevitable given the scale of change needed to transition to the CE. Even small-scale changes can have unexpected and unwanted side effects, such as inequality impacts generated by the regular occurrence of locating recycling infrastructure within more economically disadvantaged areas of a town or city, rather than in a higher income area.

The application of IA tools will have a critical role to play in the development of PPPs that are explicitly designed to drive forward the transition from linear production to circularity initiatives and CE solutions. The formal application of legislative IA requirements may not need to be considered, however, in the development of a CE strategy in many countries. The relatively new nature of CE strategies and initiatives may mean that CE plans (often termed CE Strategies) are voluntary/aspiration driven activities, rather than being required to be developed in law and therefore may be exempted from assessment. For example, the European Union's SEA Directive (2001/42/EC) is only applied to plans and programs that are "*required by legislative, regulatory or administrative provisions*". As a consequence, the development of city-level CE strategies, such as that from Amsterdam in CE case study C (above) are not necessarily formally required to consider the likely significant environmental (and social) effects of the strategy's options or finalization. However, as demonstrated in the case study, a lack of formal legislative requirement need not stop a progressive plan-making body from seeking to adopt IA, and other techniques, to assess and understand a CE strategy's wider consequences and use these to inform the approach applied.

As a result of the above, it is advisable that IA professionals seek to ensure that CE-related initiatives that they are involved with have some mechanism in place to identify the future environmental and social consequences of different options to progressing toward circularity. Where appropriate, this will include impact assessors promoting the voluntary integration of IA approaches within both policy development, plan making and project design. The advice presented within **CE Primer Message A**, above, is therefore also relevant in ensuring CE initiatives consider the application of IA tools to ensure that the wider environmental and social effects (positive and negative) of the changes they deliver have been considered during the decision-making process.

This issue is not new, or unique to CE initiatives. There are, unfortunately, many examples where environment/sustainability-oriented initiatives have failed to consider wider implications and generated significant negative environmental impacts. A clear example can be seen in the development of hydropower generation capacity, which itself has strong links with enabling the CE, as renewable energy is intended as the power source of such an economy. IA professionals therefore need to remain positive and build their resilience to continue to challenge the plans and projects they work on to constantly perform better in considering, responding to, and managing both their positive and negative externalities.

There are currently a limited number of examples of where IA has been applied to consider the wider environmental and social consequences of the CE or related initiatives. The Danish Centre for Environmental Assessment (DCEA) has worked on a number of initiatives where their IA team have engaged with CE-related initiatives: notably, working with the Skive municipal authority and private enterprises in Denmark to develop the *GreenLab*[37] green industrial park as an example of industrial symbiosis. DCEA worked with the municipality on the SEA of both the spatial plan and master plan for the site and on the broader stakeholder engagement. Their work included developing and applying a lifecycle screening tool within the SEA process[38].

A further example can be found in the work on the World Health Organization (WHO). In 2018/19 the WHO published two key reports that acted to recognize the potential of the CE to drive a sustainable future, but responded to concerns that there was limited published material that considered the health implications of such a transition:

- Circular economy and health: opportunities and risks (WHO, 2018)[39]
- Assessing the health impacts of a circular economy (WHO, 2019)[40]

The WHO reports seek to encourage the inclusion of positive and negative health effects in CE policy debates and seek to engage the health sector's involvement in such discussions. The 2019 report provides the health sector—including HIA practitioners, with recommendations on:

i. Approaches, methods, and resources for health impact analysis.

ii. Prioritizing policy recommendations for use in CE initiatives.

iii. Materials and resources for awareness-raising on sustainable production and consumption in a health-friendly manner.

While oriented toward the health risks and opportunities of the CE transition, the generalized advice across these reports is likely to be of value to IA professionals seeking to better understand how to engage and influence circularity initiatives through their work.

There may also be a role for IA to help advance and balance CE initiatives, which have received some criticized on failing to effectively consider the potential social consequences. The application of IA approaches to CE initiatives have the potential to help identify, understand, and address the unintended consequences of transitioning toward circularity, including:

- The potential socio-economic and macro-economic impacts on developing countries and global inequities[41]. For example, the impact of imported secondary clothing on markets for textile crops within developing nations.

- Some studies have found that CE initiatives have paid insufficient attention to their influence and impact on pathways and sectors in developing countries, in particular impacts on agriculture[42].

- CE approaches have also been criticized as being too based on theory and thinking from the Global North and fail to put circularity into a social equity and social justice perspective. This is an issue that is receiving increasing consideration, including from the African Circular Economy Network (ACEN).

Finally, given the CE is intended to be powered by renewable energy, the environmental and social consequences of a global transition to renewable energy at large scale require further understanding for their environmental and social consequences. While individual renewable projects are often assessed via EIA/ESIA, and in some cases SEA is applied where regional and country scale renewable energy plans/strategies exist, the wider environmental and social impacts of national and global transitions to renewable energy need to be better understood. As with all the above issues, this is an area where IA may be able to assist CE, and the wider sustainability agenda, in helping to deliver the transformational change needed to set the global economy on a sustainable path, while minimizing unintended adverse social and environmental effects.

SECTION SUMMARY: THE ROLE OF IMPACT ASSESSMENT IN ENABLING THE CIRCULAR ECONOMY

- Greater opportunities for broader systemic changes toward CE are provided at the policy, plan, and program scale. Existing SEA systems are well placed to adapt to contribute to this transition.
- Project impact assessment can act as an important circularity checkpoint within the consenting and financing process. While project-level decisions cannot in themselves affect system redesign, they can provide the potential for innovations in design and materials which all contribute to a CE future. Collaboration across project level developments is also critical to CE progress.
- Traditional IA-related mitigation is unlikely to be sufficient in helping move away from existing linear approaches to those that offer more circularity; IA will need to find opportunities to start earlier to increasingly influence core concepts so that multiple policies, plans, and projects support a circularity mindset to enable the transition needed toward a CE.
- Policies, plans, strategies, and projects designed to enable and progress the CE will all contain the risk of unintended environmental and social consequences and the opportunity to generate untapped additional benefits for nature and communities alike. As such, the appropriate application of IA tools in the development of strategic to project-scale CE initiatives is critical to ensure they help contribute toward the SDGs and wider sustainability.

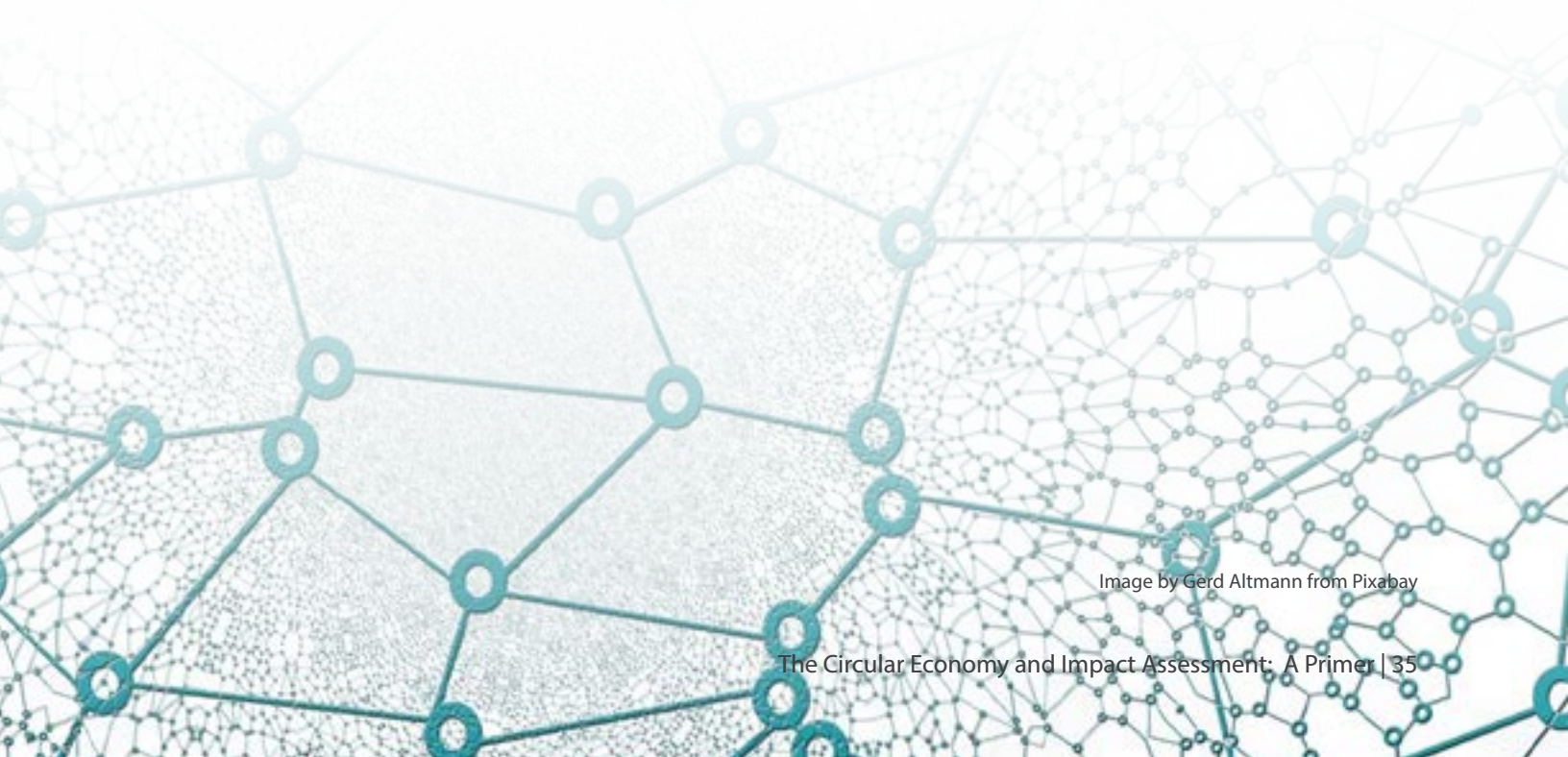
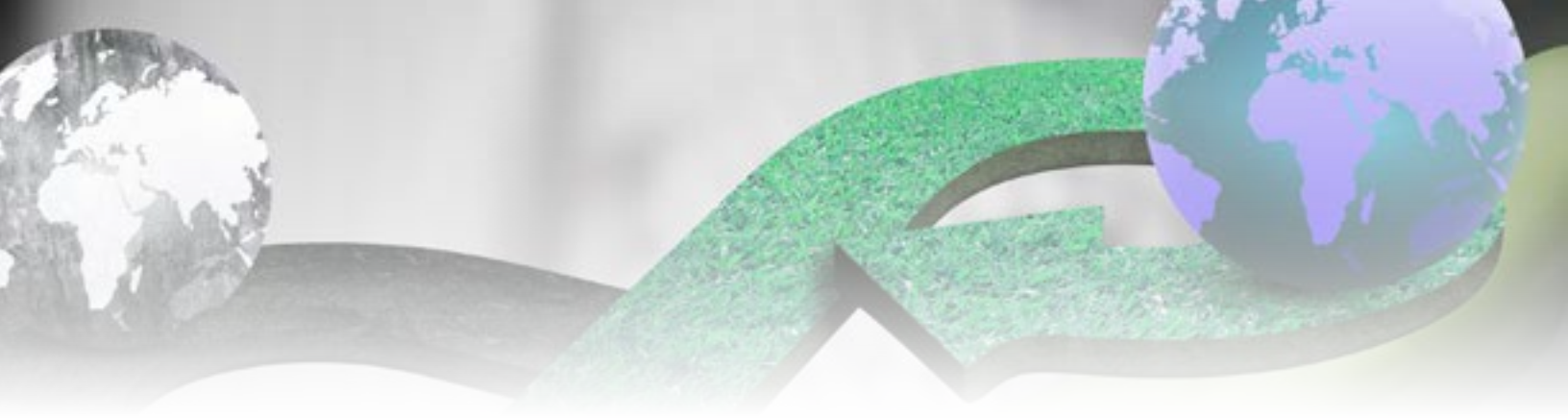


Image by Gerd Altmann from Pixabay



5. Next Steps in Aligning IA and CE

This primer is designed to stimulate discussion about the relationship between the CE and IA, among IA professionals and across the many other professions involved in helping the world transition to circularity. As a primer it is not intended to provide all the answers, but instead stimulate debate and provide direction for the development of practice.

To this end—alongside the CE primer's Messages (Section 4) and the key message boxes at the end of each of the previous Sections-—the project identified several areas where IA professionals should seek to further exploration this topic.

The aim is to use this primer as a springboard to assist the future development of IA practice so that it plays a strong role in supporting thousands of PPP and projects that contribute to the transition toward a circular economy across the local, regional, national, and global scale.

Next-step activities in advancing IA's role in supporting the CE transition

1. Building IA knowledge of CE and sharing it

- IA networks, bodies, and institutions identifying and sharing more case studies of where IA practice has played a role in both effectively bringing in and influencing the consideration of circularity issues on PPP and projects, and where it has helped identify, avoid/address unintended negative impacts of CE initiatives.
- Regularly and deliberately seed content, discussion and presentation opportunities on the CE, SDGs, Net Zero, etc. within the IA profession's conferences, workshops, webinars, publications, and Section/network meetings to spread knowledge, drive discussion and catalyze activities.

2. Engage with CE initiatives and those working on advancing this agenda

- There is a clear need for greater engagement between professionals who are focused on IA and those who work primarily in the CE. Interaction between these two areas of professional practice will help to build understanding and generate opportunities for IA to play a greater role in enabling the transition to CE, while also helping to ensure such initiatives seek to avoid unintended negative environmental and social impacts.
- A good way to initiate such engagement may through seeking to enhance engagement between the IAIA and those FI that are already investing in CE initiatives across the world. Discussions on the role of FI Environmental and Social policies and the related application of ESIA will help to generate greater experience of the positive role IA can play in enabling CE progress both on those projects with specific circularity objectives and on far more wider projects, which if not consider may further lock-in the impacts of linear resource usage.

3. Develop IA's professional role in the CE

- The professional language and terminology currently differ between the IA profession and those working more closely with CE initiatives. This presents a potential barrier to IA providing timely and effective support in the CE transition. The IA profession should seek to consider existing CE terminology, such as BS8001's principles described in Section 1, to determine how and where such concepts can be adapted, adopted, and applied within IA practice.

- Review current IA legislation, FI policy, and wider professional guidance to identify whether they are sufficient to enable effective consideration of circularity issues, or whether there is room for improvement. For example: Does existing IA legislation enable appropriate assessment of production processes, the source and use of (primary) resources, the reuse/recycling of waste and broader considerations such as the sustainable availability of different resources?

- The IA profession should seek to see its tools, capabilities, and experience applied more broadly and our recommendations to deliver environmental, social, and health enhancements taken up. In particular, in many areas of the world IA is still not applied in many large ecosystem-changing activities such as forestry and agriculture. Further, there are few examples of a legislative/policy need for developers and investors to publicly justify why IA identified negative environmental impacts were not avoided, or social enhancements not adopted.

4. Enhance future IA practice by adopting CE-oriented concepts

- By better understanding and integrating CE concepts and approaches (e.g., lifecycle perspectives and systems thinking) into IA some of the more complex areas of practice may be improved. Developing a better understanding of the indirect, unintended, and cumulative impacts at the systems level.

- In relation to the above, the application of both the Espoo Convention and Kiev Protocol—that provide an international basis for applying IA in a transboundary context—may be able to enhance the effectiveness through adopting a circular economy perspective in their future development.

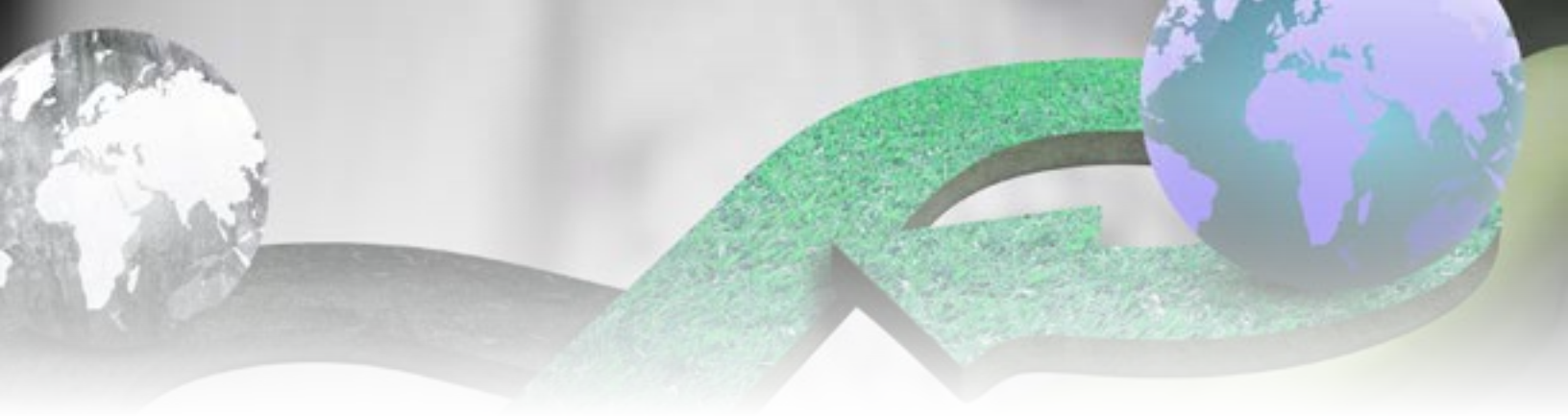
- The CE in IA, however, does not just need to be about opportunities for innovation and future practice development; it also provides us with reasons to bring pockets of existing good practice to the attention of the profession as a whole. Those who work on IA with Indigenous Peoples (IP) will already know that many of their approaches to decision making embed deep sustainability thinking beyond that of our current economic systems. As such, IA professionals may wish to seek to make links between current CE concepts and the traditions of IP, e.g., seven-generation decision-making methods, both when working on PPP and projects with IP communities, but also within wider discussions that seek to advance IA professional practice.

5. Explore and build the tools to enable IA to support the progress of CE transition

- Further work is needed to better identify and define where the benefits of the IA process best align with circular economy principles, opportunities, and initiatives. Equally, it must be recognized that IA approaches have limitations and should not be seen as a panacea for delivering circularity of wider sustainability. Future activities could therefore seek to identify how IA can augment other tools supporting CE thinking to drive better solutions in practice.
- IA's role in delivering public engagement into PPP and project decision making is a clear example of one such benefit that is enabled by the assessment process, which may be missing in some CE initiatives. As such, work to consider how public engagement in IA can be enhanced to augment CE may provide a useful starting point for next steps in this area.
- As with other areas of IA, monitoring to understand how effectively the IA process has been at influencing CE activities will need to be better understand and suitable tools developed.

Beyond the above CE- and IA-oriented next steps, no future-looking publication conducted in the 2020-21 period can ignore the impact of the COVID-19 pandemic on society and the functioning of our globally-interconnected economy. As such, the IA profession must consider how to develop future practice to make the most of the lessons learned from the pandemic and the opportunities it has presented to break away from the negative impacts inherent within the old normal.

IA professionals are already in the vanguard of seeking to deliver a better more sustainable normal. By considering how we progress in adopting, sharing, and embedding the CE into our future professional practices, we have the opportunity to double down on supporting humanity toward a sustainable common future.



6. Further Information and Wider Reading

This section provides links to additional resources identified by the authors that we believe would be of value to IA professionals seeking to better understand and integrate CE within their future practice.

The World Bank's short course on CE

- **CE video modules** from the World Bank's open-learning-campus https://olc.worldbank.org/content/circular-economy

CE Standards

- **BS8001:** Framework for implementing the principles of the circular economy in organizations – Guide (BSI, 2017) https://www.bsigroup.com/en-GB/standards/benefits-of-using-standards/becoming-more-sustainable-with-standards/BS8001-Circular-Economy/
- **XP X30-901:** Circular economy: Circular economy project management system – Requirements and guidelines (AFNOR, 2018) https://www.afnor.org/en/news/practical-guide-circular-economy/

CE approaches at Policy Scale

- **CE toolkit for policymakers.** Ellen MacArthur Foundation advice pages https://www.ellenmacarthurfoundation.org/resources/apply/toolkit-for-policymakers
- **EU Circular Economy Action Plan:** A New Circular Economy Action Plan for a Cleaner and More Competitive Europe (European Union, 2020) https://ec.europa.eu/environment/circular-economy/

CE approaches at City Scale

- **Zero waste cities initiative and examples** https://zerowasteworld.org/how-does-it-work/
- **CE in cities.** Ellen MacArthur Foundation advice pages https://www.ellenmacarthurfoundation.org/our-work/activities/circular-economy-in-cities
- **Reflow:** EU examples of co-creating circular & regenerative resource flows in cities https://reflowproject.eu/

CE approaches in international finance

- **Money makes the world go round** (and will it help to make the economy circular as well?) (Working Group FinanCE, 2016) https://circulareconomy.europa.eu/platform/en/knowledge/money-makes-world-go-round
- **Circular economy finance guidelines** (ABN AMRO, ING, RABOBANK, 2018) http://fintecc.ebrd.com/insight/insight-circular-economy-finance-guidelines
- **How the CE can help the environment** (EBRD, 2019) https://www.ebrd.com/news/2019/how-the-circular-economy-can-help-the-environment.html

- **Accelerating the transition to circular economy:** Improving access to finance for circular economy projects. A report by the Informal Commission Expert Group "Support to Circular Economy Financing" (European Union, 2019) https://ec.europa.eu/info/publications/accelerating-transition-circular-economy_en

CE and IA

EIA & SEA

- **Applying Circular Economy Theory in Environmental Impact Assessment** (Yijun, Ying & Xuhong, 2011) International Conference on Biology, Environment and Chemistry Vol.1 http://www.ipcbee.com/vol1/107-Z00405.pdf

Health

- **Assessing the health impacts of a circular economy** (WHO, 2019) https://www.euro.who.int/en/health-topics/environment-and-health/health-impact-assessment/publications/2019/assessing-the-health-impacts-of-a-circular-economy-2019

Cultural Heritage

- **Circular economy strategies for adaptive reuse of cultural heritage buildings to reduce environmental impacts** (Foster, 2020) Elsevier. *Resources, Conservation and Recycling,* Volume 152 https://www.sciencedirect.com/science/article/pii/S0921344919304136

Related IA materials

- IAIA FasTips. Impact Assessment and the Sustainable Development Goals (SDGs) (Partidário & Verheem, 2019) https://www.iaia.org/uploads/pdf/Fastips_19%20SDGs.pdf

- Minsk Declaration: Outcome of the Meeting of the Parties to the Espoo Convention, 7th session and Meeting of the Parties to the Protocol on SEA, 3rd session (13 - 16 June 2017) (UN, 2017) http://www.unece.org/index.php?id=45098#/

Endnotes

1. After IAIA definition of Impact Assessment: https://www.iaia.org/index.php
2. For further details, see https://www.un.org/sustainabledevelopment/sustainable-development-goals/
3. After Ellen MacArthur Foundation definition: https://www.ellenmacarthurfoundation.org/circular-economy/concept
4. Kate Raworth (2012) Oxfam Discussion Paper: A safe and just space for humanity – Can we live within the Doughnut? (Oxfam, 2012) and continued here: https://www.kateraworth.com/doughnut/
5. TNO's 2018 report is available only in Dutch; however, further information about TNO and the CE agenda can be found here: https://www.tno.nl/en/focus-areas/circular-economy-environment/
6. To learn more about some of these different schools of thought, see: https://www.ellenmacarthurfoundation.org/circular-economy/concept/schools-of-thought
7. BS8001: Framework for implementing the principles of the circular economy in organizations – Guide (BSI, 2017)
8. Circular Economy Action Plan - For a cleaner and more competitive Europe (EC, 2020): https://ec.europa.eu/environment/circular-economy/pdf/new_circular_economy_action_plan.pdf
9. Paper session "Potential role of life cycle assessment in EIA, SEA and management" led by Annie Levasseur and Wouter Achten is the only IAIA conference session between 2015-20 to make specific reference to the CE; it included the paper "What role will IA play in the circular economy?" by Josh Fothergill, co-author of this primer.
10. A poster by Elsa João (University of Strathclyde), entitled "The circular economy joins sustainability teaching."
11. The Survey Monkey research questions and summarized results can be downloaded from FothergillTC's website via https://d665ab80-22e6-4add-ad92-76b02481d18c.filesusr.com/ugd/4da99e_c03694cd17e8403ea0ffb6694e2e55a4.pdf
12. Other terms included in the list available to those undertaking the survey: Transformation, Regenative, Collaborate, Change Management, Stewardship, Restorative, Transparency, Communication, plus a free text option to add additional words a respondent associated with the CE.
13. https://sustainabledevelopment.un.org/index.php?page=view&type=400&nr=41&menu=35
14. Accessible here: https://www.ebrd.com/who-we-are/our-values/environmental-and-social-policy/performance-requirements.html
15. https://donguselekonomiplatformu.com/en/tmm.html
16. Taking a holistic approach to understanding how different parts of a system can influence one another and the relationship of the system to the parts over time (BS8001, 2017)
17. Accessible here: https://www.iaia.org/uploads/pdf/Guideline_Standard_IA%20Professionals.pdf
18. ISO/TR 44000:2019 Principles for successful collaborative business relationship management (ISO, 2019): https://www.iso.org/standard/72800.html
19. Further details about MI-ROG can be found here: https://aecom.com/projects/circular-economy-action-major-infrastructure-resources-optimisation-group-mi-rog/
20. Accessible here in Arabic, Chinese, English, French, Russian and Spanish: https://sustainabledevelopment.un.org/post2015/transformingourworld
21. IAIA FasTips 19: Impact Assessment and the Sustainable Development Goals (SDGs), (Partidario and Verheem, 2019), available here: https://www.iaia.org/uploads/pdf/Fastips_19%20SDGs.pdf

22. Schroeder, Anggraeni and Weber (2019), The Relevance of Circular Economy Practices to the Sustainable Development Goals, *Journal of Industrial Ecology*, Vol.23, No.1
23. See for example: https://www.ellenmacarthurfoundation.org/news/the-ellen-macarthur-foundation-signs-new-agreement-with-un-environment
24. Details of this UN meeting can be found here: https://www.un.org/ecosoc/en/events/2018/joint-meeting-ecosoc-and-second-committee-%E2%80%9Ccircular-economy-sdgs-concept-practice%E2%80%9D
25. Further details of the expert group meeting outcomes are accessible here: https://sustainabledevelopment.un.org/content/documents/18317Background_Note_Session_5_FINAL.pdf
26. Alexandre Lemille diagram accessible here: http://wiki.p2pfoundation.net/Circular_Humansphere#Graphics
27. For full Reference, see **Box 1**.
28. Papers from IAIA's annual conferences and symposia (including the 2018 event - Using IA to achieve the SDGs in Asia) can be accessed by following the relevant links here: https://www.iaia.org/events.php
29. See Footnote 15 for full reference and link.
30. Details of the 7th session of the Meetings of the Parties to the Espoo Convention, including the Minsk Declaration can be accessed here: http://www.unece.org/index.php?id=45098#/
31. Amos, R., Lydgate, E. Trade, transboundary impacts and the implementation of SDG 12. Sustain Sci (2019). https://doi.org/10.1007/s11625-019-00713-9
32. For further information see: https://www.kateraworth.com/doughnut/
32. Amsterdam city doughnut https://www.kateraworth.com/wp/wp-content/uploads/2020/04/20200406-AMS-portrait-EN-Single-page-web-420x210mm.pdf
33. https://www.geofluxus.com/amsterdamnulmeting/
34. The CE Primer Messages are also presented in the IAIA's IA and Circular Economy FasTips document - as the Five Important Things to Do - which was written by the same authors and completed as part of the wider outputs of this research.
35. Accessible (to IEMA members) here: https://www.iema.net/preview-document/materials-and-waste-in-eia
36. For example, carbon footprinting as set out in IS0 14064 (Carbon Footprint Calculations, Greenhouse Gas Emissions and Offsetting) and water footprinting in ISO 14046 (Environmental management — Water footprint — Principles, requirements and guidelines).
37. Find out more about the site here: https://www.greenlab.dk
38. This work is partly described – in relation to its consideration of climate change effects – in the case example within: Environmental Assessment for Climate Smart Decision Making – Good Practice Cases, IAIA and Netherlands Commission for Environmental Assessment, 2017.
39. Accessible in English and Russian, here: https://www.euro.who.int/en/publications/abstracts/circular-economy-and-health-opportunities-and-risks-2018
40. Accessible in English only, here: https://www.euro.who.int/en/health-topics/environment-and-health/health-impact-assessment/publications/2019/assessing-the-health-impacts-of-a-circular-economy-2019
41. As highlighted in this TNO paper: https://hcss.nl/report/circular-economy-and-developing-countries
42. As discussed in this 2019 Chatham House report: https://www.chathamhouse.org/2019/05/inclusive-circular-economy

Acronyms and Initialisms

ACEN	African Circular Economy Network
BAT	Best available technologies
CE	Circular economy
DCEA	Danish Centre for Environmental Assessment
EBRD	European Bank for Reconstruction and Development
EC	European Commission
EDCIF	Environmental Defence and Consumer Interest Forum
EIA	Environmental impact assessment
EPR	Extended producer responsibility
ESIA	Environmental and social impact assessment
FI	Financial institution
ICT	Information and communication technology
IA	Impact assessment
IAIA	International Association for Impact Assessment
IP	Indigenous Peoples
ISO	International Standards Organization
IEMA	Institute for Environmental Management & Assessment
GHG	Greenhouse gases
HIA	Health impact assessment
LCA	Lifecycle assessment
NCEA	Netherlands Commission for Environmental Assessment
NGO	Nongovernmental organization
SDG	Sustainable Development Goals
SEA	Strategic environmental assessment
SIA	Social impact assessment
UN	United Nations
WHO	World Health Organization

The Circular Economy and Impact Assessment

The Circular Economy (CE)s a sustainable economic concept that defines a destination for a future global economy operating within an environmental ceiling (/limits) and a social protection floor. The CE is intentionally designed to keep valuable outputs in use either in the same form, or by restoring them, rather than extracting new resources, and at the same time enable living systems to regenerate the resources consumed from them. As such, the concept goes well beyond waste and recycling, to enable the creation of favorable biological conditions, benefits sharing, and meeting energy demands from renewable power.

This primer provides impact assessors, and other professionals with key information to better understand the CE and the role impact assessment can play in enabling more sustainable decision making that moves polices, plans, programs, and projects toward the transition to circularity.

About Fothergill Training & Consulting Ltd

FothergillTC is a bespoke sustainability consultancy providing practical solutions to complex challenges and the resulting change management processes needed to improve performance. We act to develop the capacity of the organizations we work with, leaving them better equipped to delivery in a more sustainable manner.

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About the International Association for Impact Assessment

IAIA is the leading global network on best practice in the use of impact assessment for informed decision making regarding policies, programs, plans, and projects. Find more at www.iaia.org.

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