



World challenges | Oxford answers

The Circular Economy

Boundaries and Bridges

September 2019

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What is the circular economy?

A circular economy is an economic system where products and services are traded in closed loops or 'cycles'. It is an economy where growth is not fuelled nor dependent on finite resources.

Although different organisations that focus on circular economy have varying definitions, we found in our study that many agree it is characterised as an economy which is regenerative by design, with the aim to retain as much value as possible of products, parts and materials.*

Digging a bit deeper... we found a consistent view of the overall aim of a circular economy.

- Transitioning out of a 'take, make, dispose' linear model
- Creating a system that allows for longevity, optimal use, refurbishment, remanufacturing and recycling of products and materials while maintaining a continuation of quality of products for the users, which can be achieved without loss of revenue or extra costs

Ellen MacArthur Foundation
Principles of Circular Economy:

1. Design pollution and waste out of the system
2. Keep material and products in use at optimal level
3. Build and restore natural capital and regenerate natural systems

* Circular Economy definition based on interviews conducted with members of PACE. The following organisations participated in the interviews Philips, GEF, WRI, DSM, UN Environment, Accenture, DSGC, ING, Circle Economy, EMF, IRP.



Wicked problems need systemic approaches

Wicked problems

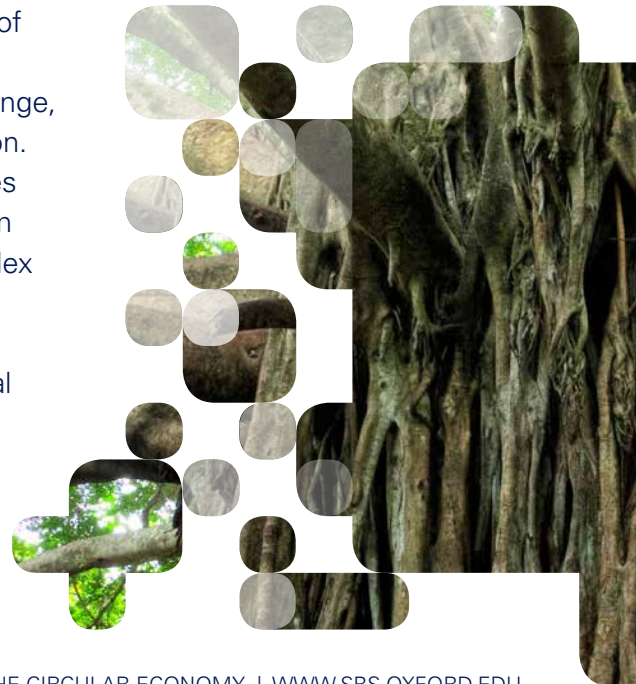
A circular economy therefore requires fundamental changes across multiple systems. The ultimate goals of reducing resource consumption and environmental pollution underlying the concept of a circular economy are complex problems with unclear solutions. These kinds of wicked problems cannot be addressed by an individual company or an individual country in isolation¹.

System change

Scholarship and practice on business and the environment over the last decade has begun to acknowledge that unless there is a shift in focus to the systemic nature of environmental problems and their respective solutions, we are unlikely to see the kinds of changes required to address biodiversity loss, climate change, and natural resource depletion. Sustainability, and approaches like circular economy that aim to provide solutions to complex environmental problems, by definition have a focus on systems and not on individual actors.

Ecosystems

‘Sustainability is a system-based concept and environmentally at least only begins to make sense at the level of ecosystems and is probably difficult to really conceptualise at anything below planetary and species levels’².



¹ Markides, C., & McGahan, A. 2015. What if small changes really could change the world?. London Business School Review, 26(3), 40–44.

² Gray, R. 2010. Is accounting for sustainability actually accounting for sustainability... and how would we know? An exploration of narratives of organisations and the planet. Accounting, Organisations and Society, 35(1): 47–62





Features of complex systems

Complex systems have several features that make them difficult to fundamentally change. These features include³:

- 1. Tight coupling:** 'The actors in the system interact strongly with one another and with the natural environment'³.
- 2. Feedback:** The actions of actors in the system feedback on themselves due to tight coupling. Decisions made by actors change things not only in a confined way but by affecting the natural world and the decisions of other actors³.
- 3. Nonlinearity:** 'Effect is rarely proportional to cause'. This can be negative in the case of the climate system where it is not a simple case of an increase in carbon emissions leading to a predictable increase in impacts. It can also

be positive for interventions in systems where if an intervention is timed right and targets the underlying rules of the system, it can lead to a nonlinear amplification of the intervention's effects⁴.

- 4. Self-organisation:** The structure of the system emerges from the feedback between different actors and elements in the system, 'generating patterns in space and time and creating path dependence'³.

³ Sterman, J. 2001. "System Dynamics Modelling: Tools for Learning in a Complex World". California Management Review, 43 (4): 8-25.

⁴ Farmer et al. 2019. "Sensitive intervention points in the post-carbon transition". Science, 364 (6436): 132-134.

Redefining systems

Redefinition

Systems change for sustainable development requires the purpose of many systems, including systems for production and consumption, to be redefined.

Rules

The redefinition of purpose and associated system rules are powerful leverage points⁵, and if done at the right time and in the right way can lead to lasting change⁴.

Relationships with new actors

For example, a shift in purpose from providing energy access to ensuring sustainable livelihoods opens new connections between energy and the services enabled by energy (jobs, water, health centres). Critically, framing the purpose of the system in this way shifts the focus away from traditional energy players and towards new actors including health professionals, community groups and entrepreneurs.

⁴ Farmer et al. 2019. "Sensitive intervention points in the post-carbon transition". Science, 364 (6436): 132-134.

⁵ Meadows, D. H. (2008). Thinking in systems: A primer. London: Earthscan.





Redrawing boundaries and building bridges

Barriers

Existing boundaries between different systems and between different actors can be a barrier to redefining purpose.

Boundaries

A boundary in a general sense is a means of delineating one area from another. An organisational or system boundary provides clarity for organisations and systems to function.

Building bridges

Redrawing system boundaries and – ultimately – building bridges across boundaries – requires collaboration between many different partners, across sectors, industries and geographies. This process of creating connections between actors can be challenging as it requires individual organisations to rethink their role in the system in relation to others.

Living bridges

In creating the conditions for organisations and industries to collaborate in order to change systems, we take inspiration from living bridges.

These are bridges which have emerged over years weaving together the roots of living trees in a process sometimes referred to as 'tree shaping'.

As the trees grow, the roots increasingly become intertwined with one another – creating bridges which are 'alive'. These bridges can be particularly strong and resilient to the shifting environment. They are constantly evolving and, under the right conditions, grow stronger year by year.

Khan, Gulnaz. 'Surreal Photos of India's Living Root Bridges'. National Geographic. 2018. www.nationalgeographic.com/travel/destinations/asia/india/living-root-bridges-clean-village-mwalynnong-india/





Living bridge builders

When thinking about the special skills required to build these living bridges, a few key characteristics appear to be present:

Vision. We believe living bridge builders must be able to see the bigger picture and anticipate how to best shape the roots so they weave together strongly.

Dexterity. In some cases, bringing together the different roots and branches needed to create living bridges requires builders to create supports to guide the process.

Patience. It can take many years to build living bridges – focussing on the long term horizon is important.

Humility. Living bridges are about the trees, the roots and the branches. The role of the bridge builder is to shape the relationships so that they become strong and deeply interconnected.

We believe these skills are consistent with those necessary to develop organisations that transcend boundaries. Living bridge builders focus on weaving together the relationships needed to drive the collaboration required to enable system change.

www.india9.com/i9show/Living-Root-Bridge-48779.htm

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Living bridge case study: Introducing PACE

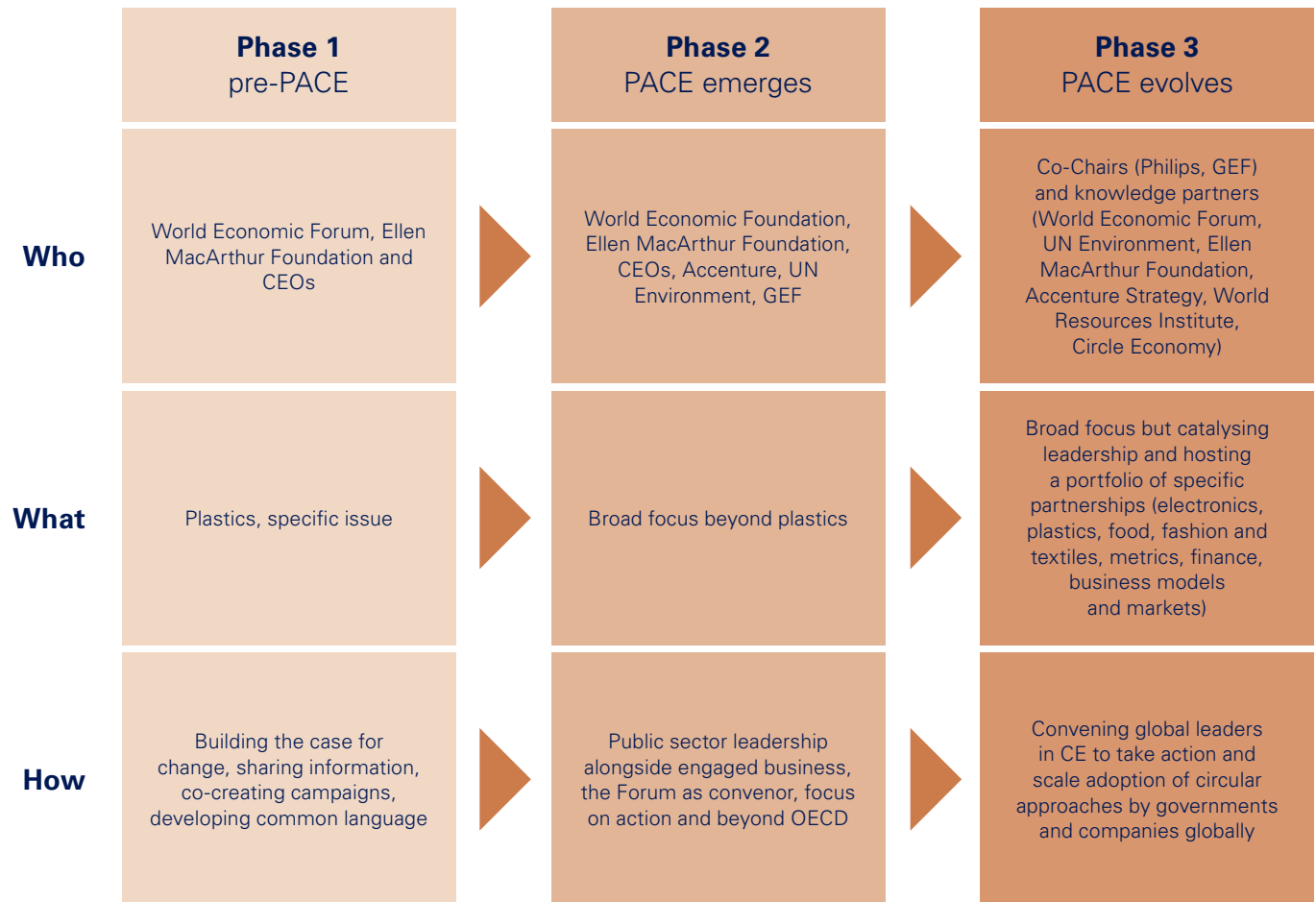
The Platform for Accelerating the Circular Economy (PACE) was launched in 2017 as a public-private collaboration, hosted by the Forum, co-chaired by the CEO of Philips, the heads of the Global Environment Facility and UN Environment, and with Ellen MacArthur Foundation (EMF), International Resource Panel, Circle Economy, Accenture Strategy and the World Resources Institute as knowledge partners.

PACE emerged following a collaboration between EMF and the Forum, Project Mainstream. This project convened industry players to tackle systemic stalemates in global material flows, with an initial focus on Plastics. As part of this collaboration, the New Plastics Economy report was launched in 2016. At launch, the report received significant social media attention, contributing to the wave of public awareness around the need to tackle challenges related to

single-use plastics. The included statistic that there would be 'more plastic than fish by weight by 2050' has become shared widely to promote urgent action.

The CEOs leading this effort quickly recognised that they would not be able to tackle the systemic changes required to achieve the circular economy transformation alone. A public-private collaboration that actively engaged policy makers and other stakeholders would be critical. They were also keen to move beyond research and campaigns and towards establishing meaningful and impact-focused collaborations. They challenged the Forum to use their strengths in bringing together public and private-sector leaders, to move beyond plastics, and to move beyond a focus on Europe. Frans van Houten, CEO of Philips, who had been the chair of Project Mainstream, agreed to take on leadership for the newly formed PACE in 2017.

History of PACE



Principles

Three main principles governed PACE from its founding:

1. Public-private collaboration
2. Global reach
3. Focus on action and scale

PACE has developed a three pronged strategy:

Leadership	Convening a global leadership group committed to advancing the circular economy transition and working together to overcome specific barriers to progress;
Projects	Catalysing and hosting a portfolio of specific partnerships (electronics, plastics, food, business models and markets)
Learning	Capturing learnings from projects and translating into replicable frameworks and approaches

Governance and membership

Governance

The co-chairs were chosen for their strong business and political leadership, and for their commitment to shaping action-focussed public-private partnerships. The knowledge partners grew organically prompted by a desire to include a range of organisations who have demonstrated leadership and analytical excellence related to the circular economy. This also provided an opportunity to bring these organisations together to foster active collaboration.

The knowledge partners and co-chairs engage in monthly phone calls to discuss strategy and progress for PACE.

Membership

In order to become a member of the platform, an organisation has to have a champion who is a senior-level person e.g. a CEO or a Minister.

Members are expected to drive specific initiatives in a bottom-up way, according to the overall principles of the platform.

For example:

1. Philips initiated a project on capital equipment with Circle Economy
2. Coca-Cola, the Minister of Maritime Affairs of Indonesia and the World Bank initiated a call for the Global Plastics Action Partnership led by the World Economic Forum
3. The work on Cities and Circular Economy for Food is led by the Ellen MacArthur Foundation
4. The Electronic waste project in Nigeria is led by GEF and UN Environment

The Forum's role was to build and host the overall Platform, including collaborating with partners to develop the strategy; engaging leaders; catalysing new initiatives such as the Global Plastics Action Partnership and helping scale partner efforts like the Capital Equipment Coalition. The Forum's annual meeting in Davos, the Sustainable Development Impact Summit and its regional meetings served as key milestones to launch and advance partnerships and actively engage leaders.

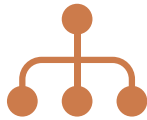


Evolution

As the platform has evolved, it has retained some flexibility in how it is organised. One of the big challenges has been to maintain a focus while simultaneously going from something specific (plastics) to much broader (Circular Economy as a whole).

The Forum has used the co-chairs and knowledge partners to navigate these tensions. A second challenge has been the process of working with private and public stakeholders who have different timeframes and processes. The Forum has overcome this challenge by acting as a 'partnership broker' – trying to understand all the perspectives, understanding how partners work and why they work in different ways, and engaging as a trusted and neutral partner.

Key challenges over time



Platform goals and structure

Scope

Specific versus broad – keep the focus on action, where's the focus?

Brokering

Individual needs of different partners, translating

Focus

Areas where there are huge needs but not so much happening yet e.g. construction – role of WEF/ others to identify these needs and identify partners



Projects and individual partners

Prioritisation

Supporting partners to identify what their priorities are, what they need from the collaboration with others that they couldn't do on their own

'PACE projects cut across geographies and industries, with public-private partnerships and the aim of scaling up. In order to further achieve systemic change, involvement is growing across the full supply chains' **Accenture**

'The platform must focus on bringing value by being continuously active, being open to all, and most importantly sharing lessons learned and best practices in order to avoid fragmentation and create greatest impact' **Philips**

'We always try to work in partnership with other organizations within and across sectors whether we are developing metrics and targets frameworks or trying to accelerate progress on an issue. We have found this collaborative approach to be a critical impact multiplier.' **WRI**

Outcomes and impact of PACE



Outcomes



Impact

Bringing the public and private sector into collaborations to scale impact around circular economy initiatives, in mature, emerging and developing economies

Helping to create and adjust enabling frameworks (e.g. policy, technology, business models) to address specific barriers to advancing the circular economy

Applying blended financing models on projects that incorporate a balanced contribution from public and private partners

Looking forward: PACE 2.0



One of the next steps for PACE is to scale.

To date, some 60 leaders have joined PACE, with growing interest from governments and companies.

In order to manage more projects and members, a larger team will be required.

Part of The Forum's mandate has been to incubate the platform, to invest in it for the first few years and define the strategy in line with member and partner goals.

In order to continue to scale the Platform, a Secretariat will be hosted in the Hague based within the World Resources Institute, led by Global Director David McGinty.



Seven tips from a living bridge builder

- 1. Set the objective.** Clear overarching objective and a process for making sure this is inclusive, allows for a common language and vision to emerge and to change over time
- 2. Design for flexibility.** Frame the scope and allow for flexibility. Avoid single points of failure including over dependency on any single partner.
- 3. Map the system.** Map the key parameters. Who are the players? Are there 'unconventional' partners you're missing? What can each potential partner bring to the table? What are the motivations for working together?
- 4. Shared values.** Mechanisms that allow for individual goals to be protected – ensuring that the identity for the overarching collaboration is coherent but allows for differences to emerge.
- 5. Trust is critical.** Developing trust among the partners, visibility and openness about differences as well as similarities.
- 6. Sharing knowledge.** Means of protecting intellectual property without compromising the goals of the project.
- 7. Constant review.** Re-evaluation over time – recognition that the ultimate goal may be for boundaries to be redefined so that the job of the platform organiser may come to an end.

*Source: Interview with Antonia Gawel, World Economic Forum





Seeding collaboration: Developing a framework for building bridges

From our conversations with PACE partners we were able to identify five consistent considerations which can support the design effective collaboration through platforms such as PACE.



Introducing the 5Is



Interest

Why are you interested in the Circular Economy?
How does it fit within your company/organisation?
How will it impact your industry?



Intent

What transitions do you intend to achieve?
Is it at a company or industry level?
Is it about contributing to a material flow?



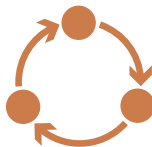
Inputs

What are your contributions?
Is this a core/affiliate project you want to lead?



Impact

What is the intended 'positive' impact (on the system)?
What is the impact after a year?
How was 'negative' impact mitigated?



Improve

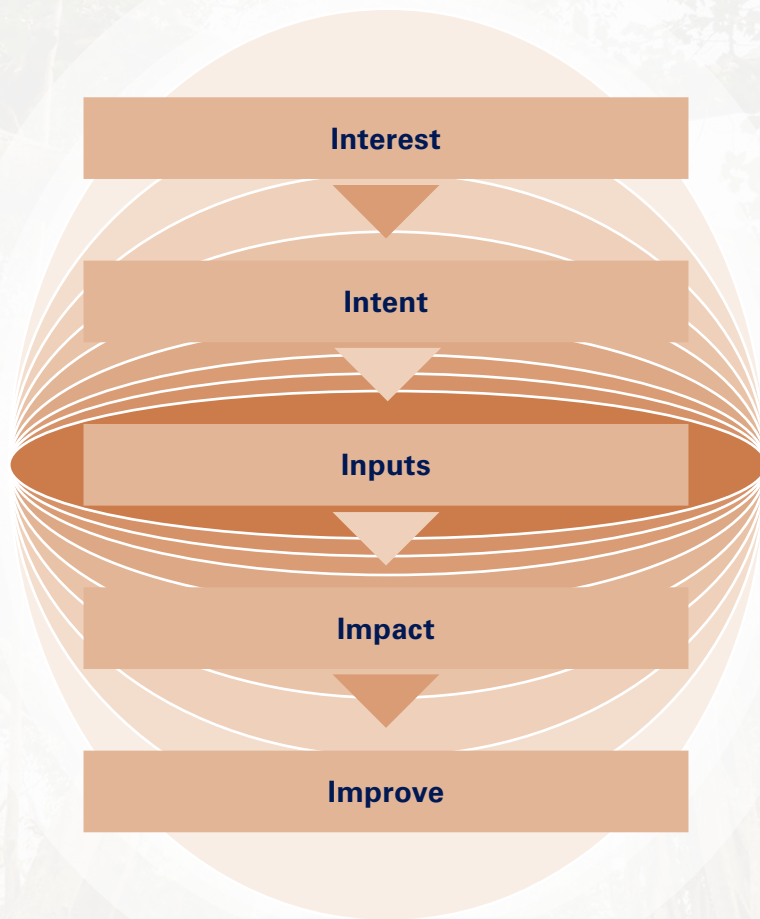
What do you need to improve on now?
What do you need to improve in a year?



5Is and building bridges

Boundaries		
Private	Public	Non-government

Interest	Sharing a vision towards building circular practices.
Intent	Engaging collaboratively and being open to learning and sharing best practices.
Inputs	Contributing resources; knowledge, time, leadership and other requirements for collaboration.
Impact	Building a stronger, more connected system of different actors in circular practices.
Improve	Continuing to grow the bridge with more actors, contributing to the strength of the whole system, ensuring no fragmentation in the process.



Royal Dutch Philips is a multinational technology company, focusing on healthcare goods divided into consumer healthcare and professional care. Philips integrates the circular model into their operational core by not only focusing on reducing their own carbon footprint but also through innovation and delivery of business models that reduce waste, lower consumption, and provide learnings across industries.

‘The platform requires smart growth - not growing for the sake of growth, but looking at circular economy barriers and inviting organisations and countries where there is a need for circular economy and opportunity for capacity building.’

PACE Position: Co-Chair

Interest	Leading in the Circular Economy. Engaging on Capital equipment buy-back.	Exploring circular revenue models. Engaging in pre-competitive collaboration.
Intent	Providing frameworks for industry. Driving impact beyond the sector of work.	Collaborating with “cross runners”. Sharing best practices / measurements.
Inputs	Leadership of PACE. Capital Equipment Coalition	Contribution to projects in e-waste: Provision of learnings across industries.
Impact	Activation of stakeholders. Cross-industry collaboration.	Setting up system to tackle e-waste.
Improve	Stakeholder inclusion.	How to share best practices.



The Global Environment Facility

The Global Environment Facility (GEF), with the leadership of Naoko Ishii is a Co-chair of PACE. The GEF is an international partnership of 183 countries, international institutions, civil society organisations and the private sector, that addresses global environmental issues. Since 1992, the GEF has provided over \$18.1 billion in grants and mobilised an additional \$94.2 billion in co-financing for more than 4500 projects in 170 countries. In recent years, Circular Economy has become an important aspect of GEF strategy.

PACE Position: Co-Chair

Interest	Moving the organisation strategy to work at a systems level. Engaging the private sector to leverage funding.	Moving from 'fixing' environmental problems in developing countries to preventing them at source.
Intent	Shape public-private partnerships to tackle environmental challenges in developing countries. Co-financing of projects.	Create replicable project frameworks to enable scaling at regional and eventually global levels.
Inputs	Leadership of PACE. Partnership with governments. Technical knowledge and expertise.	Funding of the e-waste in Africa collaboration. Financing allocated to country partners of the Global Plastics Action Partnership.
Impact	Strategic alignment. Replicable e-waste projects supported.	Scalable support for plastics within the GPAP collaboration. Raising profile on circular economy in governments.
Improve	Enhanced knowledge of developing country partners on the circular economy potential.	Documenting and sharing experiences.

Accenture is a knowledge partner of PACE. Separately, Accenture focuses on helping their clients adopt the circular economy principles. Accenture helps scale circular practices through five circular business models (Circular Supplies, Resource Recovery, Product Life Extension, Sharing Platforms and Product as a Service). ‘Digital Innovation’ is a strategic priority for Accenture and they worked with The Forum on the Fourth Industrial Revolution for Circular Economy paper, which was released in Davos in 2019.

‘PACE brings together a very diverse set of stakeholders from the public and private sector. It takes time to build such a diverse coalition and find a shared way of working, but once you manage that you can create immense impact and acceleration of circular practices.’

PACE Position: Knowledge Partner

Interest	Taking a ‘convener’ role. Helping accelerate action.	Deepening focus on digital innovation. Engaging as a knowledge partner.
Intent	Accelerating technological utilisation. Creating clear strategy for projects.	Supporting a strategy for platform expansion.
Inputs	Strategic consulting partnership.	
Impact	Established leader in consulting space. Provision of project management.	Support of overall platform strategy and management.
Improve	Sharing common language between other knowledge partners.	Identifying strengths areas of focus.

Ellen MacArthur Foundation



Ellen MacArthur Foundation aims to accelerate the transition to circular economy. The Foundation works in partnerships with foundations as well as businesses in order to lead systemic change in the circular space. Key goals for a transition include designing out waste and pollution, keep products and materials in use, and regenerate natural systems. EMF serves as a knowledge partner for PACE and provides guidance, support, and strategic design across PACE core and affiliate projects.

‘PACE provides a communication conduit: it carries the message to wider audiences through consistency of message and amplification.’

PACE Position: Knowledge Partner

Interest	Accelerating transition to circular economy. Cresting a common shared language.	Tacking systemic material streams across different industries (food, plastics, fashion).
Intent	Accelerating technological utilisation. Driving agreement on shared message.	Broadening audience. Making sure there is a resilient model.
Inputs	Advisory. Knowledge and analytics.	Hosting affiliate projects.
Impact	Growth of focus on systemic transformation. Successful convening across industries.	Supported platform strategy and management.
Improve	Sharing common language between other knowledge partners.	

The United Nations Environment Programme (UNEP), is the leading global environmental authority that sets the global environmental agenda, promotes the coherent implementation of the environmental dimension of sustainable development within the United Nations system, and serves as an authoritative advocate for the global environment. UNEP approaches the agenda of circular economy as one of the pathways to advance towards more sustainable consumption and production patterns thereby contributing to SDG 12, but also stresses the role that circularity plays in promoting multiple benefits in terms of addressing climate crisis and promoting inclusive green economy. At PACE, UNEP serves the role of engaging impactful stakeholders, including governments and representatives of the scientific community.

PACE Position: Knowledge Partner

Interest	Ensuring PACE responds to identified priorities of developing and emerging countries	
Intent	Shaping common language on circularity.	
Inputs	Bringing partners together, especially government, and scientific community (IRP).	Driving workstreams on circular electronics in Africa, circular economy alliance for Africa and circular procurement.
Impact	Coordinated contribution by multiple actors. Practice – learning by doing and sharing lessons learned.	
Improve	Ensuring everybody is committed to contribute (time/effort/funds).	Developing / harmonizing approaches to measure progress towards circularity.

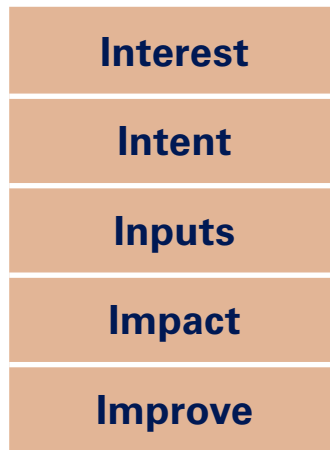
World Resource Institute mission is to promote environmental sustainability, economic opportunity, and human health and well-being. WRI partners with local and national governments, private companies, publicly held corporations, and other non-profits, and offers services including global climate change issues, sustainable markets, ecosystem protection, and environmental responsible governance services. WRI in The Hague will host PACE moving forward, providing guidance and experience from their previous cross-boundary partnerships.

‘Scaling up requires a clear scope, shared values between participants and the platform, and well-established roles in governance.’

PACE Position: Knowledge Partner/Host

Interest	Taking a ‘convener’ role. Bringing value.	Building on existing work in this space.
Intent	Making circular economy mainstream.	
Inputs	Experience from previous projects.	Convening power in the Hague.
Impact	Scale and Focus for PACE. Development of a platform strategy.	Management of ongoing platform development.
Improve	Sharing common language between other knowledge partners.	Structuring obligations and responsibility.

The PACE framework mapped to the 5Is







Capital Equipment Coalition

The capital equipment coalition is an initiative of PACE and encourages businesses in the production and supply of capital equipment goods to embark on their own journeys towards the circular economy. The Capital Equipment Coalition is a group of nine forward-thinking businesses that have committed to applying circular economy principles to preserve and recover value across the lifecycles of their respective products.

PACE Position: Core Project

Interest	Leading a project in the Circular Economy. Exploring circular revenue opportunities.	Demonstrating pre-competitive collaboration in action.
Intent	Accessing new markets, increasing market share. Attracting and retaining talent.	Building a positive financial business case. Triggering innovation capacity in businesses.
Inputs	Sharing learnings across industries.	Insights translated to different companies.
Impact	Activation of stakeholders. Cross-industry collaboration.	Organisational change in businesses. Established network of change leaders.
Improve	Including wide range of stakeholders. Engaging downstream logistics of supply chains. Engaging customer facing functions.	Sharing best practices.

Building bridges between systems and the environment

To make deep systems change for the circular economy and other sustainable development goals, the boundaries between existing systems and the environment need to be redrawn. Often, this type of bridging requires the work of an independent organisation or set of organisations.

The Forum has played an instrumental role in this process through setting up the PACE platform, crucially involving others through the structure of Co-Chairs and knowledge partners and maintaining a bridging role to manage tensions.

Lessons from PACE for other platforms and initiatives of this kind include:

1. Ensuring there is clarity in the vision but flexibility in understanding of key definitions such as Circular Economy
2. Making sure the connection between PACE and other Circular Economy initiatives is clear, maintaining a connection to broad and systemic goals
3. Developing close relationships and a deep understanding of different partners' strengths and weaknesses

Building bridges between actors (within the system)

As the boundaries between systems and the environment change, new opportunities for collaboration between actors emerge. In the case of Circular Economy and many other sustainable development challenges, this requires competitors to consider new ways of working together. And it also requires public and private sectors to decide how best to complement each other.

The PACE platform through the project structure allows partners to take leadership in developing a project focused on taking action for Circular Economy, and to draw on the expertise within the wider community of organisations to deliver on this action.

Lessons from PACE and other initiatives that aim to build these types of bridges include:

1. Ensuring that individual organisations are clear on their own goals within the wider context of the platform
2. Maintaining a role for the convening organisation (e.g. The Forum) to intervene, to suggest new projects that are critical for the overall goals of the platform
3. Identifying mechanisms that protect individual goals without compromising the overall goals of the project, e.g. convening organisation as repository for sensitive information⁶

⁶ Perkmann, M., & Schildt, H. 2015. Open data partnerships between firms and universities: The role of boundary organisations. *Research Policy*, 44(5): 1133–1143.



Conclusion: Building living bridges

Systems change requires the purpose of systems to be redefined. To do this, many existing boundaries between systems and between organisations need to be overcome. We need to build living bridges which are based on developing conditions for deep collaboration.

Special skills are necessary to build these living bridges. PACE is an example of a platform that embodies many elements of the Living Bridge model.

The 5I Framework is a tool that can enable the effective collaboration needed to grow these bridges together.



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