

A Knowledge & Science Global Agenda Towards Circular Economy

White Paper Phase 1/2022

Scope

- Portuguese Presidency of the Council of the European Union (January 2021-June 2021)
- Memorandum of mutual cooperation between CECOLAB, the Brazilian Centre of Innovation in Circular Economy and the African Circular Economy Network
- Informal meetings with scientists, experts and regional and national government authorities

Main outcomes/highlights

- The importance and the governance model of Knowledge and Science to support the development of public policies at a global scale
- Governance model of cooperation on knowledge and science to implement Circular Economy at a global scale
- Promoting ecological public procurement practices wields enormous purchasing power, accounting for an average of 12 percent of gross domestic product (GDP) in OECD countries and up to 30 percent of GDP in many developing countries, and plays a key role in achieving the Circular Economy transition
- Atlas of Circular Economy: successful and unsuccessful strategies and projects in Circular Economy

Editor in Chief

Association CECOLAB – Collaborative Laboratory Towards Circular Economy | CECOLAB

Steering Committee

João Nunes (CECOLAB, Portugal)

Beatriz Luz (Exchange4Change, Brasil)

Peter Desmond MA(Oxon) MA FCA MBA (ACEN, South Africa)

Global Agenda Network Support

Ashok Pandey (CSIR-Indian Institute of Toxicology Research, India)

José Teixeira (University of Minho, Portugal)

Héctor A. Ruiz (Autonomous University of Coahuila, Mexico)

For more information

To order copies of this White Paper or receive information about the Global Agenda or other related publications, please contact CECOLAB at circular@cecolab.pt

Download this White Paper at <https://www.cecolab.pt/projects/>

Contents

Executive Summary	03
Our Message	04
Overview	07
Circular Economy: Problems & Challenges	09
Call-to-Action	13
Final Words	15
Contributors	16

Executive Summary

Association CECOLAB – Collaborative Laboratory Towards Circular Economy, following the **international conference** (1) “Europe: a Knowledge & Science Bridge Towards a Global Circular Economy”, organized by CECOLAB on April 20th and 21st 2021 within the **scope of the of Portuguese Presidency of the Council of European Union** (PPUE); (2) the participation of 82 personalities representing more than 25 countries; and (3) based on the Memorandum of mutual cooperation between CECOLAB, the Brazilian Centre of Innovation in Circular Economy and the African Circular Economy Network, the **importance and necessity to construct a “Knowledge & Science Global Agenda Towards a Circular Economy” White Paper was identified**. This White Paper is composed by three phases.

- Phase 1 (2021/2022): White Paper proposal elaboration through the collection of international contributions from international informal meetings with high experts and a critical review of the barriers on the implementation of Circular Economy at a Global Scale (open for public consult);

- Phase 2 (2023): expansion of the network cooperation and input, contacts with high relevance entities for the global transition to a Circular Economy and integration of the public consultation inputs; and
- Phase 3 (after 2023): Implementation of actions.

The main objectives of the present White Paper are:

- O1. **Collection of contributions at an international level** and opening discussions with governmental and non-governmental entities of high relevance, knowledge and responsibility for the implementation of the Circular Economy, in order to identify problems and challenges;
- O2. **Construction of a tool and framework** for a common **Global Agenda for Circular Economy** in order to place knowledge and science at the genesis of policies for defining action plans and geo-regional targets; and
- O3. **Starting a global collaborative network: Global Circular Economy Cooperation.**

The methodology used to gather worldwide contributions addressing Circular Economy challenges and how to implement and accelerate the transition for Circular Economy takes into account global problems and challenges.

Our message



Intending a Circular Economy transition and not considering: that it is a challenge and a global problem:

- the importance and role of knowledge and science to support effective policies; and*
- society's need for education and literacy as the most powerful vector,*

will be a strong mistake and problem for the survival challenges of the Planet and Society.

The Circular Economy may seem, at first thought, easy to implement because, for many entities and people, it represents the recovery of waste without cost. However, it is very different, seeing as how transport and pretreatment costs, rules/regulations (e.g. compliance of security and quality of second raw materials) and bureaucracies is considerably high.

(1) The beginning of the process to design new policies; and (2) The transfer of new knowledge and technology to the market, need more interaction with knowledge and science. On the other hand, we need more cooperation and clear interaction between knowledge and science entities/people at a global scale if we want to accelerate the transition towards a Circular Economy model.

Managing the Circular Economy only at the place of waste generation and not thinking about the origin of the generation of resources on a global scale shows a lack of understanding of how economic metabolism works. The world is facing major global challenges as we reach 8 billion people and as 70% of them are located in urban ecosystems.

This White Paper represents a long work of interaction with international experts from different regions concerned and available to support a global vision of cooperation and action. It is essential to value the collective work of People: People are the key to the changing of paradigms.

João Nunes, President of CECOLAB





Circular economy is a call for transformation in all levels of our society.

We are now well aware of the impact of our daily decisions. So far, technological developments have brought us new tools, comfort, and convenience, but has also led us to a world full of waste and pollution. This is because we have never thought full cycle. Since the industrial revolution products and services have been designed for their use phase and no consideration has ever been made for the after-use phase. We must now design out waste from our value chains.

Business must re-evaluate its practices, adjust their value proposition and review its joint responsibilities along the value chain. Banks and financial agencies must understand that there are new boundaries, long term returns and parameters to be considered when delivering project finance for circular business models. Governments must develop new public policies and directives to guide us all into this new future path of production and consumption and science can help us to generate new integrated and multi-disciplinary solutions.

We are talking about a new perception of material value, new attitudes and behavior. Reverse logistics becomes reverse supply chain moving the focus from cost to investment.

The New Circular Economy Action Plan, published in March 2020, recommends international guidelines for resource management, which means that developing countries must be sitting on the table side by side with Europe.

Therefore, the actions listed on this white paper and our joint commitment to work together will be essential to bring knowledge and science to think about closed loop solutions, integrating all countries perspectives and creating a just, circular and low carbon society across the world.

Beatriz Luz, Co-chair of the Brazilian Circular Economy Innovation Centre



Centro
Brasileiro de
Inovação em
Economia
Circular



Since its foundation in 2016, the vision of the African Circular Economy Network (ACEN) has been to build a restorative African economy that generates well-being and prosperity, inclusive of all its people, through new forms of economic production and consumption which maintain and regenerate its environmental resources.

This can't be achieved without a high degree of collaboration between all key stakeholders. To implement circular principles across the continent, we need to recognise that Africa plays a key role in many global value chains. As a result, international collaboration and partnerships are an essential component of the means by which countries in the Global South can create development pathways which enhance the well-being of citizens and other living creatures.

As the world looks to equalise the trade and power imbalances between the Global North and the Global South, the circular economy in Africa has a key role to play. As has been seen with mobile phone technology, Africa has an opportunity to leapfrog towards a circular economy to the benefit of people, planet and prosperity.

ACEN looks to accelerate the transition to a circular economy in Africa, for Africa by Africans, using the plentiful resources of people and renewable energy. ACEN continues to advocate for increased food resilience for its people and careful management of critical raw materials through the implementation of circular principles by means of enabling policy environments.

We must ensure that the circular economy focuses on social and community benefits using context appropriate technologies. Through circular principles, we can mitigate the negative impacts of climate change and biodiversity loss for the benefit of the people who have contributed the least to the problem but are impacted the most.

This White Paper lays out the problems and challenges facing the implementation of circular principles around the world and offers potential solutions with practical calls to action. Through new forms of collaboration between regions of the world, we can make faster progress towards a more prosperous and resilient society.

Peter Desmond, Co-Founder, African Circular Economy Network



Overview

The transition from a linear economy model to a more responsible economic model - efficient in the use of resources through their life cycle, regenerative and for the people - it is a critical challenge for the future. The acceleration transition to a Circular Economy model is a key option for the Planet. The recognition of the value and the importance of knowledge and science to define policies, transfer knowledge to the market, global cooperation, regional symbiosis, international trade rules, and Circular Economy literacy are important challenging dimensions. Additionally, the Covid 19 Pandemic generated important lessons: one of the most important is that society recognized the importance of knowledge and science to answer to high level problems and challenges.

Association CECOLAB – Collaborative Laboratory Towards Circular Economy is the key entity in Portugal to promote this transition at a national and international level. CECOLAB has the mission to develop and transfer knowledge and technology solutions to the market addressing Circular Economy, and to create qualified scientific jobs to allow and facilitate the transition towards Circular Economy.

The transition towards Circular Economy must be global and urgent, without leaving anyone behind, and must take into account the regional and local particularities. In this context, on April 20th and 21st, within the scope of the **Portuguese Presidency of the Council of European Commission** (PPUE), CECOLAB

organized an international conference titled "Europe: a Knowledge & Science Bridge Towards a Global Circular Economy"¹ and the joint signing of the memorandum of mutual cooperation between CECOLAB, the Brazilian Centre of Innovation in Circular Economy² and the African Circular Economy Network³.

Additionally, International Informal Meetings in context of "Knowledge & Science Global Agenda Towards a Circular Economy" were organized, as well as other informal meetings between national and regional government authorities. With these informal Meetings, CECOLAB proposed to pave a roadmap for a Global Agenda on Circular Economy and to extend closer cooperations on Circular Economy to a large network of recognized players working worldwide in this subject.

The International Informal meetings aimed to bring together reputable researchers/entities and stakeholders working on Circular Economy all over the world and to gather their contributions - ideas and concerns – in facing the challenges of design and implementation of the Global Agenda Towards Circular Economy.

The Informal Meetings gathered contributions of institutions and people from 25 countries (Fig. 1). Of each contributor it was asked a) to indicate his/her interest and availability for this Global Agenda; b) to provide his/her opinion on how the global agenda should be built; and ultimately, c) to provide notes on the main

¹ <https://www.cecolab.pt/events/ppue/>

² <http://cbiec.com.br/>

³ <https://www.acen.africa/>

topics to be discussed in the acceleration for a Circular Economy model. The contributions gathered during the international conference titled "Europe: a Knowledge & Science Bridge Towards a Global Circular Economy" and the informal meetings were analysed and summarised, allowing to identify six main Working Areas that the "Global Agenda Towards Circular Economy" should address (Fig. 2).

Meetings highlights

- # The importance of Knowledge and Science in supporting the development of public policies at a global scale.
- # A governance model for cooperation on Knowledge and Science to implement Circular Economy at a global scale will have to be created.
- # Prioritizing pilot value chains cases for future replication in others with high importance for the Circular Economy transition, considering the six work areas identified.
- # Promoting ecological public procurement practices yields enormous purchasing power, accounting for an average of 12 percent of gross domestic product (GDP) in OECD countries and up to 30 percent of GDP in many developing countries, plays a key role in achieving Circular Economy transition.
- # Atlas of Circular Economy: successful and unsuccessful strategies and projects on Circular Economy is an important tool.

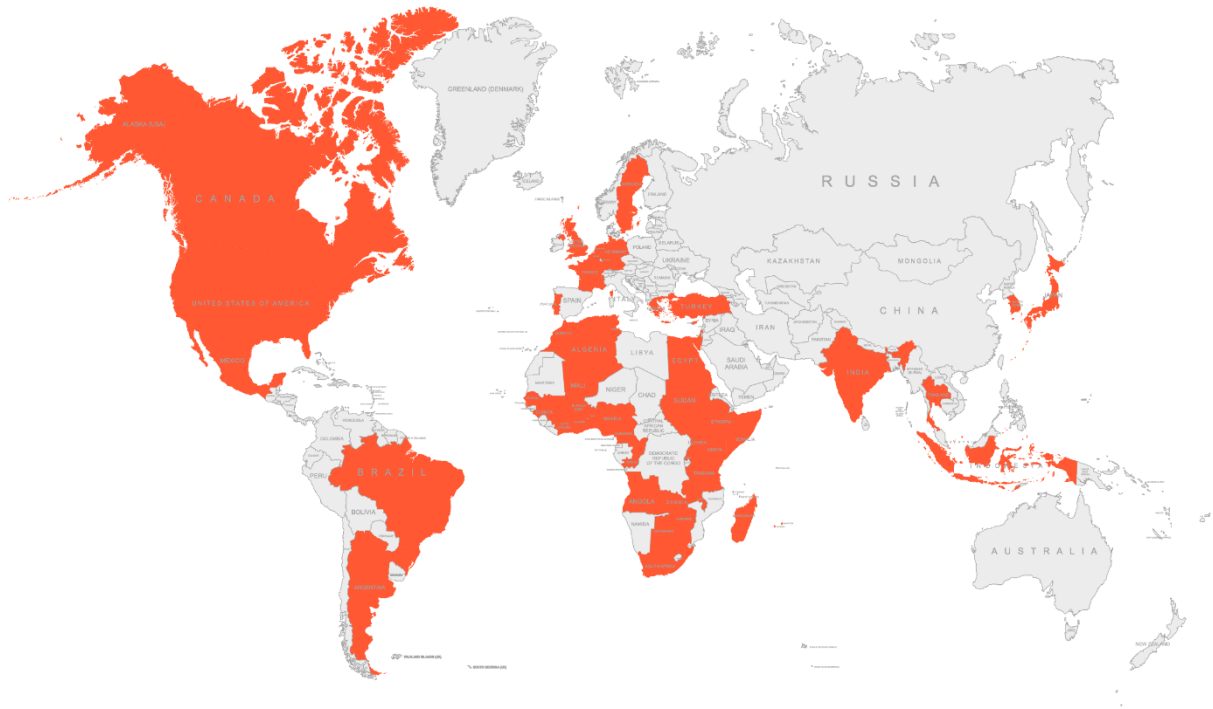


Figure 1. Worldwide distribution of the participants in the International Informal Meetings organized by CECOLAB.



Figure 2. The six Working Areas of the Global Agenda Towards the Circular Economy.

Circular Economy: Six Working Areas

Circular Economy, as defined by the European Commission⁴, *“aims at maintaining the value of products, materials and resources for as long as possible by returning them into the product cycle at the end of their use, while minimising the generation of waste. In this way, the application of the principles of circularity can ensure a new and more sustainable socio-economic model”*. Additional important dimensions are identified, namely (1) *“the empowerment of the “refuse” from the consumers and (2) the regeneration of the natural systems*. To that end, Circular Economy must be observed in a holistic manner to approach all the possible interactions. In our work, assessing all contributions, we observed that these interactions could be associated in one way or another with to the six main working areas. Each one of the Working Areas identified has its own specific particularities and challenges which are now presented and apply to the Circular Economy value chains.

⁴ 2015 European Commission Circular Economy Action Plan: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52015DC0614>

1. International Cooperation & Governance

a) International Cooperation

In general, Circular Economy practices are much more advanced in developed countries than in developing countries. In developing countries, the difficulties in implementing the Circular Economy are not only derived from the lack of availability of technologies, but are mostly due to the lack of strong policies and efforts to change behaviours. The context of the developing countries needs to be approached in order to tackle all specificities of the Circular Economy worldwide, reducing the global differences.

Transition has to be truly global and to include Global South countries, in order to not dilute or weaken their voice. Thus, this Global Agenda is an opportunity to conduct cross learning experiences. It is essential to increase investment in international cooperation between countries at different stages of development to generate solutions that will be able to engender new green tools, (bio)products, services and policies complying with the principles of Circular Economy.

The challenges to be faced are not only local but also global, and partnerships and transboundary actions are required.

At the same time, the local identity of each recognized partners (organizations, hubs, institutions...) should be maintained within the Global Agenda. Their connection to their territories allows the Global Agenda to approach the local specific needs and to integrate them into new solutions and initiatives.

National Circular Economy Guides (NCEG) are a very useful starting tool to navigate along this circular transition, as NCEG deal with very different stakeholders (from governments, academia, entrepreneurs and NGOs) and define milestones for transition. However, at the same time, the network must be empowered as a whole.

International projects and activities on Circular Economy should be supported, not only between European/Global North countries, but also including the Global South countries (e.g., projects funded by

EU's Circular Economy Finance Support Platform). These projects also need to be multidisciplinary in order to approach all perspectives of the circular economy value chains.

b) Governance

Administrations and governance models suitable for the circular transition must be developed and supported. For that, administrations should have a holistic view of the productive sector, with technical knowledge and autonomy in order to articulate different organizations of the same or other sectors. Thus, components of governmental decisions and other large organizations should be studied.

The transition from linear to circular economy must include rigorous policies developed and supported by the knowledge and science. Nevertheless, these methodologies and policies should be distinct for each sector. For example, what is relevant for the textile sector is different for the plastic sector, and completely different for the food sector.

The creation of a governance model will be important for the high level and representative contributions from knowledge and science. This governance model is an important pathway for the relationship with high relevant entities involved in the definition of Circular Economy policies.

Circularity practices are an opportunity to improve our global value chains. The current COVID-19 pandemic situation led to a significant disruption in the global value chains, offering an opportunity to develop new standards and methods to ensure the resilience of the global economy for these types of events. These new standards and methods should be taken into consideration in national and local policies.

A network administration model is the more suitable governance structure for the implementation of the Global Agenda Towards Circular Economy. In this structure, regional brokers, identified among the different stakeholders involved, will be the key players able to orchestrate and deal with these demanding and complex interdisciplinary processes.

2. Circular Economy: Concepts & Objectives

The Circular Economy consists not only of new technologies, but also of new business models, actors, behaviours and value perceptions regarding products and more sustainable processes. It is therefore a great opportunity to establish restorative businesses, while simultaneously fulfilling many of the goals of climate change mitigation and future sustainability, which can be summarized in the 2030 United Nations' Sustainable Development Goals⁵.

The problems associated with the circular transition are systemic and similar to those which cause a low innovation rate: economic risks, innovation costs, lack in funding sources, and lack in qualified labour.

Moreover, the definition of Circular Economy itself is still not consensual, and different schools of thought coexist. Because of this, any clear Global Agenda requires a unified framework of common definitions, concepts and objectives where all key stakeholders can work together. Other concepts such as Zero Waste can also be communicated as avenues to achieve the Circular Economy.

The strategy for the Global Agenda Towards Circular Economy should therefore start by identifying a specific approach to follow. This approach must be systemic, in which different sources of knowledge and competences provided by different stakeholders can be linked to support creativity and innovation in sustainable production and consumption systems. To approach Circular Economy comprehensively, it is necessary to expand priorities beyond bioengineering and chemical engineering perspectives, and to integrate within the Global Agenda other areas of knowledge.

There is also a need to guarantee the acceptance of the Circular Economy model by consumers, investors and governments. It is also necessary to guarantee the sustainability of the Circular Economy model by having a good connection between science, technology and economy, and by ensuring that tools,

services and products are available and people are ready to accept them.

Finally, the Circular Economy must be successful in all regions and within all local chosen initiatives. Circular Economy Objectives can be different depending on the regional context. For each initiative, clear contributions and indicators are needed to measure the progress towards circularity.

3. Industrial and Economic Strategies

Circular Design is a key issue focused on minimising the environmental impact of products during their lifecycle and ensuring they can be returnable to the loop cycle and increase the efficiency of the use of resources. Following this concept, there is a need to address all stages of planned Circular Value Chains, such as Rethinking, Reuse, Repair, Restore, Remanufacturing, Regeneration, Redesign, Recover and Recuse, among other "Rs", and not only Recycling.

Integration of Circular Economy solutions into conventional processes and product development must be studied, thereby obtaining new integrated processes based on knowledge and sharing throughout a multidisciplinary approach.

Technological, regulatory, organizational, social and economic barriers must be broken to advance on Circular Economy. Nevertheless, consumer trends are the driving force for these changes to occur, and it is increasingly clear that consumers want a sustainable world.

Transition Towards Circular Economy will be possible if there is view in scale of the production chains grounded on industrial and regional symbiosis (global dimension). Thus, it is very important to study the availability, distribution and logistics of secondary products, residues and waste derived from different industries, with the aim of replacing raw non-renewable resources/materials and fossil fuel-based energy. In such a way, companies will recognise how

⁵ <https://sdgs.un.org/goals>

they can benefit from one another, developing new technologies and delineating logistic strategies, among other processes.

New added-value circular products (obtained from valorisation of secondary products, residues and waste) have to be standardized, globalized and traceable in order to improve consumer acceptance and perception of the quality, origin and composition of the product.

Digitalization and the concept of Industry 4.0 will be crucial to promote industrial metabolisms within regional/local ecosystems. Strong focus on Artificial Intelligence, IoT and Communication Technologies will allow for smart design of efficient and optimized products (for example, for new material compositions).

Despite the increasing driving force towards circularity, more economic incentives are required to boost that more stakeholders join the transition to Circular Economy. To that end, several efforts are needed, such as modelling studies to explore the effects that the increase in CO₂ price will have in resource consumption, or fiscal reforms (according with ExTax principles), and green procurement, for instance & creation a regulatory framework in the rules of the World Trade Organization.

4. Quantifying the Circular Economy

The systemic vision needed to create a Circular Economy requires the quantification of concrete indicators to evaluate circularity, and thus to assess the actual impact of circular economy implementation.

Life Cycle Thinking (LCT), with transparency and traceability are one of the most effective tools to integrate all circularity components. LCT studies should be conducted for all processes, both those on R&D and on the market.

“Circular Engineering” should be considered in the Global Agenda as a new subcategory of the Circular Economy. Circular Engineering is focused on systemic evaluation of circularity models with well-defined metrics. These metrics must be multi-physical and multiscale and range from micro (product), meso

(business) and macro (national) scales, with a vision of short, medium and long term.

The new international parametrization efforts to be included in the Global Agenda will be a milestone to quantify how circular strategies are implemented i.e., how repair, remanufacturing and sharing, among others, ensure there are savings on raw material consumption, waste generation and greenhouse gas emissions.

To better communicate the concept of Circular Engineering, existing and new Key Performance Indicators (KPI) that should be easily understandable to a wider community.

5. Knowledge Transfer, Education and Training

Knowledge transfer, education (literacy) and training are key drivers towards Circular Economy transition.

Global Agenda Network focused on the Circular Economy should invest efforts into developing good competence and skills on knowledge transfer, teaching and training of this field of expertise to researchers and technicians, policy makers, and the broader public.

The knowledge transfer between industry and science should be enhanced through incentivizing and supporting new pilot projects, accelerating the acceptance of new technologies.

Data and knowledge exchange between members of the global community should be facilitated through the creation of an Atlas of Circular Economy. There is a great need for this Atlas of Circular Economy, a shared repository that includes circular economy concepts and objectives, and strategies implemented, as well as circularity indicators, both for developed and developing countries. This Atlas should also have proper references for successful and unsuccessful circular economy examples and a tool to accelerate the circular economy transition. It would be much easier to follow innovations and new studies and develop new products if players had detailed information on a global level, including the most recent data on operating parameters and types of production, as well as the institutions behind those projects. The Atlas should have links for more

detailed websites or the contact information of the corresponding person to the study/project (researcher, innovator, etc.). The Atlas of Circular Economy should also present all possible avenues for the increase in resource efficiency, with easy and global access.

Younger generations should be included in the construction of the Circular Economy. This can be achieved not only by investing in the teaching of science and knowledge in Circular Economy, but also on the development of abilities such as soft skills, and even personal development (for example, through student networks).

A foundational course on Circular Economy should be established, which would teach the main points of the subject. By doing so, the current increase in interest and activity on this subject would be organized and any differences and confusions between participants and stakeholders would be minimized. This course should include topics like the history of the Circular Economy, avenues for efficiency in resource usage and LCT – Life Cycle Thinking, among others. Such a course should also approach the different schools of thought emerging in this field.

Any future interactions within the Global Agenda Network can also be very positive as the experiences of joint work between researchers and professors can be shared with their students, and the general public.

knowledge on how people can be motivated to change their behaviours and to support the transition towards a Circular Economy. That way, a careful bottom-up approach will be designed and implemented to promote social innovation and changes in values (e.g., a new perception of the value of materials and resources).

Educational and training programs in schools, universities and other institutions, as well as other outreach activities, directed to the new generations will create an active and positive citizenship, with a circular mindset and attitudes of social acceptance, egalitarian and inclusive. Only teaching the scientific concepts and technological tools is not enough. It is also necessary to convince students, young scientists and young people from all over the world of the value of the Circular Economy as the solution for the future.

6. Social Initiatives

Circular Economy needs to address a social perspective, to change behaviours and bring everyone on board of the transition. Circular Economy requires the support of communities and people from all the world, and should take into consideration their own cultures, customs and beliefs.

To achieve the public commitment to Circular Economy, there is a need to invest in social innovation. These innovations can lead to cocreation of circular life styles and a new narrative in order to establish a positive social and economic paradigm shift.

As stated before, the Global Agenda Network will address research in social sciences to gather

Call-to-Action

The challenges to achieve the Circular Economy on a global scale are daunting, but the rewards are worth the investment. Should material and energy cycles be closed, we will be able to reduce our impact on the natural world resources, mitigating climate change, save and reintegrate planetary resources, without excess expenditure. At the same time, we will unlock a new sustainable and inclusive socio-economic model and with it the possibility of increased wealth creation and employment.

The Knowledge & Science Global Agenda Towards a Circular Economy will attempt to do just that, and to that end, CECOLAB and the partners of the Global Agenda propose Actions to be taken in each of the six Working Areas identified:

Action 1

Contribution of Knowledge and Science to the development of public policies

The Global Agenda will perform different activities, contacts and efforts to introduce the knowledge and science dimensions in the beginning of the process of development of public policies and other important mechanisms for the Circular Economy transition. The relationship between important organisms - e.g. European Commission, United Nations Organization, World Bank, World Trade Organization and others – will be a key action of the Global Agenda, with the creation a cooperation model between Knowledge and Science and these entities: the Covid 19 Pandemic time demonstrated the importance of Knowledge and Science to response a global challenge.

Action 2

International Cooperation and Governance Model

To better represent the global distribution and national particularities of our Network partners and to achieve a combined good International Cooperation and Good Governance on Circular Economy, the Global Agenda will be organized into Regional Hubs with capacity to dialogue with important governmental and non-governmental entities. Each regional hub will develop and support ideas and projects and communicate with all stakeholders in various fields. Given the geographical distribution of our participants, we propose to divide into the following Hubs, based on the world regions defined by the World Bank⁶:

- A Hub for Europe & Central Asia;
- A Hub for North America;
- A Hub for Latin America and the Caribbean;
- A Hub for the Middle East;
- A Hub for Africa;

⁶ <https://datatopics.worldbank.org/world-development-indicators/the-world-by-income-and-region.html>

- A Hub for South Asia; and
- A Hub for East Asia and the Pacific.

A Steering Committee formed by key transition brokers to be identified by the partners in each hub and CECOLAB will be responsible for the general coordination of the Global Agenda.

Action 3

Definition of Concepts and Objectives on Circular Economy

To better have a common understanding of Circular Economy, the Global Agenda will clearly define the Concepts and Objectives on which we will all work together, achieving a common language.

Action 4

Minimum Circular Economy Criteria and Indicator at a global scale

To better measure the Circular Economy's implementation, the Global Agenda will establish and evaluate new circularity criteria and indicators taking the regional/local specificities and will promote dissemination of state-of-the-art innovations in this field. In this way, the Global Agenda is expected to provide an evaluation framework, allowing a standardized and worldwide comparison between different implementation projects on Circular Economy.

Action 5

Supporting Industry and Economy Towards Circularity

To better support the economy and industry in taking the necessary steps for the Circular Economy, the Global Agenda will support local businesses and industries in projects and dissemination initiatives so that they can adopt good circular practices (e.g., industrial symbiosis and digitalization) and management skills. Additionally, the interaction and cooperation with World Trade Organization and other important policies stakeholders will be very important in defining new mechanisms and incentives for the Circular Economy transition, with capacity to overcome the current international trade barriers (positive discriminations for Circular Economy). For more efficient action, we will focus on the priorities value chains defined in Phase 2 of the White Paper.

Action 6

Knowledge Transfer, Education (literacy) and Training

To better disseminate knowledge and to educate (literacy) and train the citizens of the circular future, the Global Agenda will support the creation of a common open platform for the Network and beyond, where resources on Circular Economy can be shared on a Global scale, including case studies, new publications and circularity measurement possibilities and examples. Global Agenda will also develop a foundational multidisciplinary course suited, ERAMUS Program model and others for different educational ranges, which will introduce the concept and ideas of the Circular Economy.

Action 7

Not leaving anyone behind: society

To better bring society along the Circular Transition, the Global Agenda will conduct other dissemination initiatives to show current and future citizens of the value of the Circular Economy worldwide, ensuring no one gets left behind.

Action 8

Atlas of Circular Economy: successful and unsuccessful projects and strategies on Circular Economy

The identification and wide communication of successful and unsuccessful cases is a key activity to accelerate the transition to the Circular Economy. This will support greater and faster replication of best practices and prevent mistakes in the development and implementation of Circular Economy projects and strategies.

Action 9

Ecological public procurement

Promoting ecological public procurement practices wields enormous purchasing power, accounting for an average of 12 percent of gross domestic product (GDP) in OECD countries and up to 30 percent of GDP in many developing countries, playing a key role in achieving Circular Economy transition. The Global Agenda will develop efforts in the contact with Public organisms to identify and create mechanisms to establish “Ecological Public Procurement Criteria”.

Final words

The White Paper on “Knowledge and Science Global Agenda Towards a Circular Economy” is a tool and a framework to prepare the way for a global understanding and transition towards Circular Economy and reflects the opinion of renowned international experts on Circular Economy.

During the meetings, it was emphasized that to fully achieve Circular Economy, it is necessary to not restrict it to any particular sector or economic activity, region or country, and to understand and manage resources in a way that provides environmental, economic and social progress. Global Agenda also identified six priority working areas to promote the transition towards Circular Economy: i) International Cooperation & Governance; ii) Circular Economy: Concepts and Objectives; iii) Industrial and Economic Strategies; Quantifying the Circular Economy; iv) Knowledge Transfer, Education and Training; and iv) Social Initiatives.

The Global Agenda will be a (i) new capacity to integrate the knowledge and science in the policies discussion and a (ii) forum for the exchange of knowledge and expertise on Circular Economy practices, and to further work in each of the Six Working Areas, prioritizing value chains to be identified in the second phase; and (iii) an Atlas of Circular Economy will be prepared. Global Agenda requires a well-organized structure based on several key actions. In that way, the collaborative initiative promoted by CECOLAB can be expanded to develop a coordinated network throughout the globe in an organized manner and connected with others initiative.

Circular Economy can only be effective if it is supported by Knowledge and Science in a very closed relationship. Despite the fact that a large number of participants within the Global Agenda Network come from academia, there is a great potential to attract other experts and stakeholders from industry, economy, education and the social sciences in the second phase of White Paper.

The implementation of the *Global Agenda Towards Circular Economy* will tackle the challenges of the future, and will ensure that Sustainable Development Goals are fulfilled globally, not just for this decade, but also beyond.

“Knowledge & Science Global Agenda Towards a Circular Economy” White Paper is structured in three phases:

- Phase 1 (2021/2022): White Paper proposal elaboration through the collection of international contributions from international informal meetings with high experts and a critical review of the barriers on the implementation of Circular Economy at a Global Scale (open for public consult);
- Phase 2 (2023): expansion of the cooperation and input network, contacts with entities of high relevance for the global transition to a Circular Economy and integration of the public consultation inputs; and

Phase 3 (after 2023): Implementation.

Contributors

The Global Agenda Towards Circular Economy was also built thanks to the worldwide discussions in the PPUE meeting and the contributions receive in the informal meetings organized (see Table 1):

Table 1 – List of Global Agenda Network experts

Name	Institution	Country
Alondra Tiemann	Gestion Verde	Chile
Anastasia Zabaniotou	Aristotle University of Thessaloniki	Greece
Apostolis Koutinas	Agricultural University of Athens	Greece
Ardi Dortmans	TNO Netherlands	Netherlands
Adrienna Zsakay	Circular Asia Association	Malaysia
Alexander Goldberg	Tel Aviv University	Israel
Ana Rubia	Exchange 4 Change Brasil	Brazil
Ashok Pandey	CSIR-Indian Institute of Toxicology Research	India
Beatriz Luz	Exchange 4 Change Brasil Centro Brasileiro de Inovação para a Economia Circular	Brazil
Beatriz Ildefonso	Young Leaders in Sustainability and Energy	Portugal
Benjamas Cheirsilp	Prince of Songkla University	Thailand
Binod Parameswaran	CSIR-National Institute for Interdisciplinary Science and Technology	India
Carlos Silveira	Comissão de Coordenação e Desenvolvimento Regional do Centro, CCDR-C	Portugal
Carlos Soccol	Universidade Federal do Paraná	Brazil
Christian Larroche	Institut Pascal, Université Clermont Auvergne	France
Claude-Gilles Dussap	Institut Pascal, Université Clermont Auvergne	France
Cristina Area	Instituto de Materiales de Misiones	Argentina
Christian Wolf	Thecnische Hochschule Köln	Germany
Cristobal Gonzalez	Universidad Autónoma de Coahuila	Mexico
Drogui Patrick	National Institute of Scientific Research, INRS, University of Quebec	Canada
Daniel Normandin	Centre for Intersectoral Studies and Research on the Circular Economy	Canada
David Fitzsimons	European Remanufacturing Council	Belgium
Débora Campos	AgroGrIn Tech	Portugal
Dean Tashobya	Ambassador at Circular Economy Institute (ACEN Country representative)	Uganda
Eldon Rene	IHE Delft Institute for Water Education	Netherlands
Emmanuel Raufflet	Pôle e3c – HEC Montreal	Canada
Filipa Figueiredo	Association CECOLAB – Collaborative Laboratory Towards Circular Economy	Portugal
Graça Fonseca	Comissão de Coordenação e Desenvolvimento Regional do Norte, CCDR-N	Portugal
Gracia Munganga	African Circular Economy Network	South Africa
Giorgio Mannina	Università degli Studi di Palermo	Italy
Gboyega OLORUNFEMI	Enviromax Global Resources Limited (ACEN Country representative)	Nigeria

Name	Institution	Country
Héctor A. Ruiz	Autonomous University of Coahuila	Mexico
Henrique Vasquez Vale	Financiadora de Estudos e Projetos – Finep	Brazil
Irem Deniz	Manisa Celal Bayar University	Turkey
Inês Freitas	CIM Alentejo Litoral	Portugal
Jin-Suk Lee	Gwangju Bioenergy Research Center	South Korea
João Nunes (CECOLAB)	Association CECOLAB – Collaborative Laboratory Towards Circular Economy	Portugal
Jorge Paiva	Association CECOLAB – Collaborative Laboratory Towards Circular Economy	Portugal
Jorge Nhambiu	Eduardo Mondlane University	Moçambique
Jonathan Wong	Hong Kong Baptist University	Hong Kong
João Coutinho	University of Aveiro	Portugal
José Teixeira	University of Minho	Portugal
John K. Barreh	Strategic Urban Development Consultants (ACEN Country representative)	Kenya
Ladeja Kosik	Circular Change	Slovenia
Lisendra Marbelia	Universitas Gadjah Mada	Indonesia
Lurdes Costa	FEUP - University of Porto	Portugal
Mark Wilkins	University of Nebraska-Lincoln	USA
Miguel Carvalho	Association CECOLAB – Collaborative Laboratory Towards Circular Economy	Portugal
Michail Koutinas	Cyprus University of Technology	Cyprus
Mohammad Taherzadeh	University of Borås & Swedish Centre for Resource Recovery	Sweden
Nuno Bento	Comissão de Coordenação e Desenvolvimento Regional do Lisboa e Vale do Tejo, CCDR-LVT	Portugal
Orlando Rojas	University of British Columbia	Canada
Otaigo Elisha	Founder at NovFeed (ACEN Country representative)	Tanzania
Paulo Ferrão	COST – European Cooperation in Science and Technology & Instituto Superior Técnico da Universidade de Lisboa (IST-UL)	Portugal
Paul Agenor Koffi	UNECA – United Nations Economic Commission for Africa (ACEN Country representative)	Côte d'Ivoire
Peter Desmond MA(Oxon) MA FCA MBA	African Circular Economy Network	South Africa
Pedro Lopes	Government of Cape Verde	Cape Verde
Petar Ostojic	Center of Innovation and Circular Economy	Chile
Rita Silva	CIM Beira Baixa	Portugal
Rosa Onofre	Comissão de Coordenação e Desenvolvimento Regional do Alentejo, CCDR-A	Portugal
Rui Caseiro	CIM Terras de Trás-os-Montes	Portugal
Ricardo Riquito	CIM Viseu Dão Lafões	Portugal
Ronald Singoma		Rwanda
Sang-Hyoun Kim	Yonsei University	South Korea
Show Pau Loke	Sustainable Food Processing Research Centre, University of Nottingham Malaysia	Malaysia
Siming You	Glasgow University	United Kingdom
Su Shiung Lam	University Malaysia Terengganu	Malaysia
Sunil Kumar Khare	Indian Institute of Technology Delhi	India
Suzana Yusuf	Universiti Teknologi PETRONAS	Malaysia
Sandra Estevens	CIM Alto Minho	Portugal

Name	Institution	Country
Susanne Kadner	Circular Economy Initiative Deutschland – CEID	Germany
Sang Jun Sim	Korea University	South Korea
Sengoga Desire	Green Resources Ltd (ACEN Country representative)	Rwanda
Teresa Jorge	Comissão de Coordenação e Desenvolvimento Regional do Centro, CCDR-C	Portugal
Thallada Bhaskar	CSIR Indian Institute of Petroleum	India
Vijai Gupta	Scotland's Rural College – SRUC	United Kingdom
Wiratni Budhijanto	Universitas Gadjah Mada	Indonesia
Yen Wah Tong	E2S2-CREATE, National University of Singapore	Singapore
Yuni Kusumastuti	Universitas Gadjah Mada	Indonesia
Zhongfang Lei	University of Tsukuba	Japan

(+351) 238 011 400

Business Centre
Rua Nossa Senhora da Conceição, 2
3405-155, Oliveira do Hospital

circular@cecolab.pt | www.cecolab.pt

