ISO/TC 323 STRATEGIC BUSINESS PLAN

Executive summary

ISO/TC 323 Technical Committee (“TC”) on Circular Economy (“CE”) was created in September 2018 to propose an answer to the global economy which is characterised as “linear”. This linear economy is mainly based on extraction, production, use and disposal. It leads to resource depletion, climate change, biodiversity losses, waste and pollution causing serious damage to the capacity of our planet to continue to provide for the needs of future generations.

To meet our current and future human needs, there is an increased understanding that a transition towards a circular economy, based on a circular flow of resources, can create and share more value with society and stakeholders, while natural resources are managed and regenerated in a sustainable way, securing the quality and resilience of ecosystems.

Some political, economic, technical, regulatory and legal dynamics promote circular strategies at many scales from global to national ones. The objective is to implement new modes of production that meet social dynamics which promote new modes of consumption. CE is a major change of mindset. Applying CE is complex and implies a system-thinking approach and may include a new set of opportunities and risks. Goals are restoring economic activities within planetary boundaries, absolute reduction in resource consumption, contribution to net carbon reduction, substitution of primary material with secondary materials, elimination of waste, toxic emissions and pollution, regeneration of damaged ecosystems, increase of economic resilience and social benefits including new jobs.

Countries from all continents participate in the TC work. They produce documents designed to harmonize the understanding of the circular economy and to support its implementation including measurement, assessment and improvement. These documents support organizations, such as government, industry, and non-profit organizations in contributing to the achievement of the UN Agenda 2030 for Sustainable Development.

From 2019 to 2022, main TC objectives were to:

- Develop the first drafts of impactful standards that support and encourage organizations to adopt CE through a time-efficiency process;
- And promote a broad and effective participation from countries all around the world.

From 2023, TC will reinforce the above 3 main objectives to publish the current set of documents by 2024.

But the TC will also focus on:

- Communication to encourage the standards use to promote an alternative and collaborative model that facilitate the transition towards circular economy;
- To engage the revision of ISO 59000 series after publication its in 2024, return of experiences would be collated to better adapt and make it more operational;
- High quality standards’ development for all types of stakeholders based on new topics related to CE while coordinating efforts and avoiding duplication of work and proliferation of divergent standards and other initiatives, for the net benefits of stakeholders worldwide.

1 Introduction

1.1 ISO technical committees and business planning

The extension of formal business planning to ISO Technical Committees (ISO/TCs) is an important measure which forms part of a major review of business. The aim is to align the ISO work programme with expressed business environment needs and trends and to allow ISO/TCs to prioritize among different projects, to identify the benefits expected from the availability of International Standards, and to ensure adequate resources for projects throughout their development.

1.2 International standardization and the role of ISO

The foremost aim of international standardization is to facilitate the exchange of goods and services through the elimination of technical barriers to trade.

Three bodies are responsible for the planning, development and adoption of International Standards: ISO (International Organization for Standardization) is responsible for all sectors excluding Electrotechnical, which is the responsibility of IEC (International Electrotechnical Committee), and most of the Telecommunications Technologies, which are largely the responsibility of ITU (International Telecommunication Union).

ISO is a legal association, the members of which are the National Standards Bodies (NSBs) of some 164 countries (organizations representing social and economic interests at the international level), supported by a Central Secretariat based in Geneva, Switzerland.

The principal deliverable of ISO is the International Standard.

An International Standard embodies the essential principles of global openness and transparency, consensus and technical coherence. These are safeguarded through its development in an ISO Technical Committee (ISO/TC), representative of all interested parties, supported by a public comment phase (the ISO Technical Enquiry). ISO and its Technical Committees are also able to offer the ISO Technical Specification (ISO/TS), the ISO Public Available Specification (ISO/PAS) and the ISO Technical Report (ISO/TR) as solutions to market needs. These ISO products represent lower levels of consensus and have therefore not the same status as an International Standard.

ISO offers also the International Workshop Agreement (IWA) as a deliverable which aims to bridge the gap between the activities of consortia and the formal process of standardization represented by ISO and its national members. An important distinction is that the IWA is developed by ISO workshops and fora, comprising only participants with direct interest, and so it is not accorded the status of an International Standard.

2 Business Environment of the TC

2.1 Description of the Business Environment

The following political, economic, technical, regulatory, legal and social dynamics describe the business environment of the industry sector, products, materials, disciplines or practices related to the scope of this TC, and they may significantly influence how the relevant standards development processes are conducted and the content of the resulting standards.

Unlimited growth in a world of limited resource is not sustainable[1]. The current dominant economic model is linear, following an extract-produce-consume-dispose step-by-step plan, that depletes the natural systems without concern for resource regeneration, ecological footprint, and consequences (e.g., global warming, biodiversity collapse, pollution, human health risk, economic and social inequalities, etc.) as shown in figure 1.

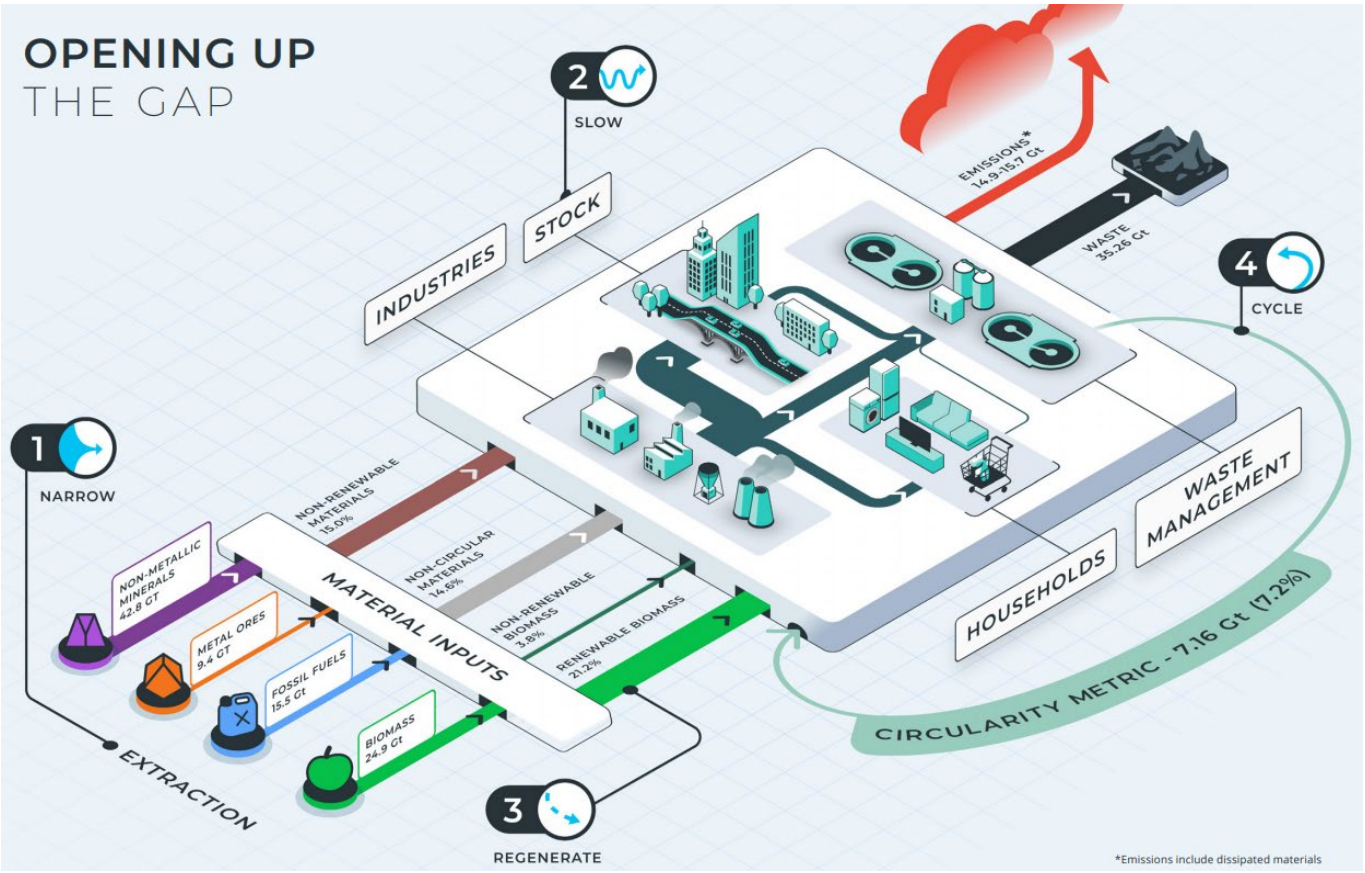


Figure 1 - This illustrates how key materials flow into different parts of the economy -including additions to stock and waste- and highlights where circular strategies (narrow, slow, regenerate and cycle) may be most appropriate. Source: The circularity gap report 2023 - https://www.circularity-gap.world/2023

The planetary boundaries concept[2] (figure 2) which demarcates a safe operating space for humanity and its over-exceed boundaries reinforces the need for solutions to tackle human impact

[1] That has already been pointed out by The Club of Rome since 1972. The Limits *to Growth, 1972,* Dennis L. Meadows, Donella H. Meadows Jørgen Randers, The Club of Rome

[2]https://www.stockholmresilience.org/research/research-news/2022-04-26-freshwater-boundary-exceeds-safe-limits.html

on ecosystems and associated consequences to human health, wellbeing, and economic progress.

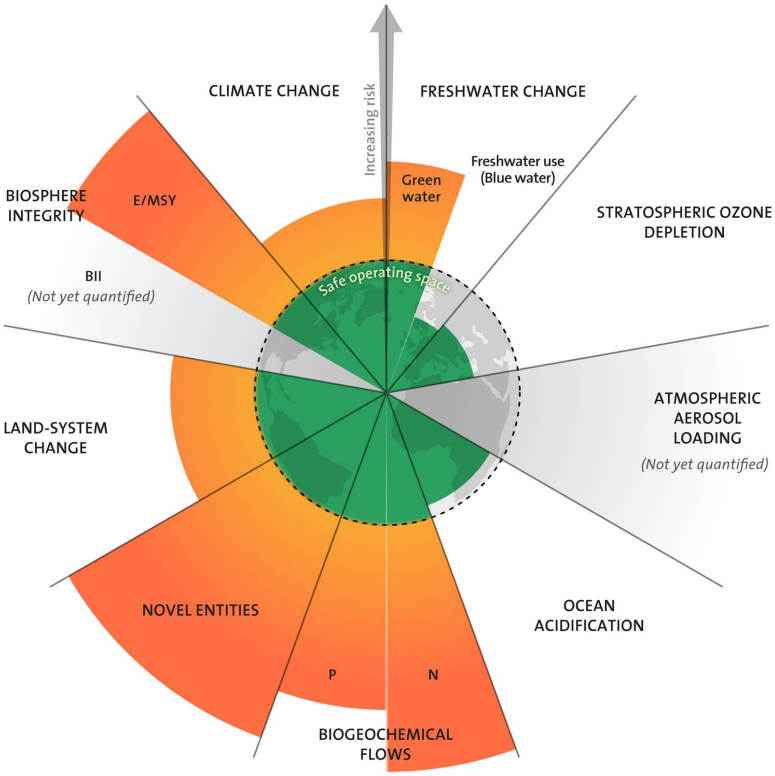


Figure 2 - The 6 on 9 transgressed boundaries are: climate change, biosphere integrity, biogeochemical cycles, land system change and, in 2022, novel entities (which includes plastic and other manmade chemicals) and green water.

There is now a growing awareness of the limitations and risks associated with the linear economy. Governments and organizations are increasingly turning to the principles of the CE to avert the worst impacts of climate change, and build a resilient, sustainable, and prosperous future. The principles of the CE, which seek to decouple economic activity from the consumption of resources, includes the elimination of waste and pollution; the continuous circulation of products and materials; and the regeneration of natural systems .

The concept of the CE is not new, with its theoretical underpinnings dating back several decades. Many of its components, such as design for circularity, circular sourcing, and material recycling, have already been embraced to varying degrees by different sectors. The activities of this TC however, promises to compile and distil the circular principles, theories, and practices into readily accessible standards to ease adoption, and implementation, by organizations.

The following is a breakdown of the business environment in relation to the TC scope, under the categories of political, economic, technical and social dynamics.

Political dynamics

Governments and global/regional governmental organizations are embracing, with varying degrees of enthusiasm, circular principles to decouple economies from the consumption of finite resources to address both short- (resource waste, pollution, biodiversity loss, ecosystems degradation, etc.), and long-term (climate change, ecosystem collapse, etc.) risks and opportunities (see economic dynamics). The resulting activities have spurred cross-jurisdictional

collaboration and multi stakeholder involvement, a recognition that transitioning to the CE will happen within globalization, where countries are intertwined by economics and shared risks.

The following is not intended to be an exhaustive list of best practices but serves to give a sense of the global interest in moving away from ills of the linear economic model. At the national level, circular economy policy dynamics can be both transversal, global dynamics and/or dynamics focusing on more specific actions such as reuse, remanufacturing, banning single use, etc. (Annex A focus on these national examples).

Examples of political dynamics at global and regional scale:

- The United Nations (UN) have developed Sustainable Development Goals (SDGs) which have been agreed to by 193 countries in 2015 to have a sustainable and poverty-free world by 2030. More details on the United Nations High-level Political Forum on Sustainable Development (HLPF) website: https://sustainabledevelopment.un.org/

Figure 3 - UN Sustainable Development Goals and Circular Economy

UN Environment Programme has developed UNEP Circularity Platform to promote circular economy processes described below: https://buildingcircularity.org/

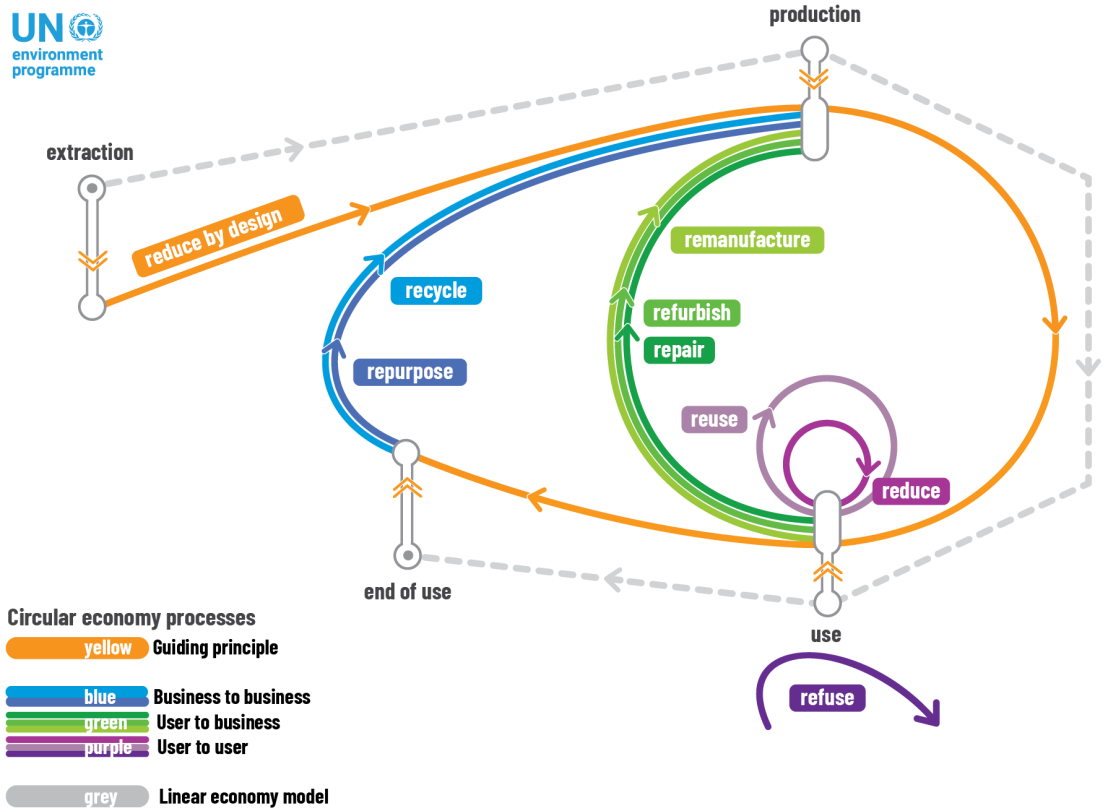


Figure 4 - UNEP circularity platform: Understanding circularity. Source https://buildingcircularity.org/

- An African CE Alliance has been formed with the ambition to spur Africa's transformation to a CE that delivers economic growth, jobs and positive environmental outco mes at the national, regional and continental levels. The 17th Ordinary Session of the African Ministerial Conference on the Environment, which took place in Durban, in November 2019, called for the widespread adoption of the circular economy on the contin ent, and committed to replicate, scale -up and use. https://www.aceaafrica.org/

- Circular economy in the Africa-EU cooperation: "The CE is an opportunity for Africa as it synergises well with economic diversification as well as industrialisation policies that are high on the continent's political agenda. Furthermore, the CE provides a paradigm for the development of new economic activities, while it simultaneously addresses some urgent environmental and social problems in the continent, such as the growing problem of plastic waste pollution. Furthermore, the projected high population growth for the continent combined with increasing levels of economic well-being will create vast increase in demand for natural resources. As such, the CE will not only be an economic opportunity, but a necessary strategic paradigm for economic development that can foster sustainable economic development while decoupling it from resource consumption and negative environmental impacts."
https://op.europa.eu/en/publication-detail/-/publication/4faa23f2-8b8a-11eb-b85c-01aa75ed71a1/language-en

- The European Green Deal, approved in 2020, sets out policy initiatives of the European Commission with the aim of making the European Union climate neutral by 2050. It is supported by an evolving set of initiatives and laws including, the European Climate Pact, the CE Action Plan, the EU Forest Strategy, the Zero Pollution Action Plan, the EU Chemicals Strategy for Sustainability and the EU Strategy for Sustainable and Circular Textiles, to name a few.
  https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en
- ASEAN adopted the Framework for Circular Economy for the ASEAN Economic Community (AEC) at the 20th AEC Council Meeting held on 18 October. The Framework aims to guide ASEAN in achieving its long-term goals of a resilient economy, resource efficiency, and sustainable and inclusive growth. In which "Standard Harmonisation and Mutual Recognition of Circular Products and Services" is one of the five Strategic Priorities.
  https://asean.org/asean-adopts-framework-for-circular-economy/

This nutshell picture reinforces the need for a CE common understanding through international standardization to be implemented.

Economic dynamics

According to the World Economic Forum: "A Circular Economy has benefits that are operational as well as strategic, on both a micro- and macroeconomic level. This is a trillion-dollar opportunity, with huge potential for innovation, job creation and economic growth."[3] Just in Europe, a report by the McKinsey Center for Business and Environment, and, the Ellen McArthur Foundation, estimates a 7% GDP rise[4] when circular economy practices are employed.

With supply chains globalized, and governments recognizing that the linear supply chain is not sustainable – government policies and intergovernmental collaboration are leading to strategies, roadmaps, regulations, and incentives to transform economies with CE principles. Similarly, organizations are also undertaking such transformations, and are looking up and down their supply chains to seek out and collaborate with trading partners and competitors. It is expected that CE principles will increasingly be topical in cross-jurisdictional business relationships and will be enshrined in future international trade agreements (similar to human rights and social responsibility requirements). Such relationships will require shared foundational understanding that the work of this TC brings.

To support organisations in capturing these opportunities, TC proposes to establish a framework to help organizations, and in particular economic stakeholders, to integrate CE within their activities, collaborate within and beyond sectors and value chains, as well as to create tools to measure the progress made in the implementation of CE.

The implementation of CE principles in processes, products and services will enable organizations to optimize the management of their resources, to collaborate throughout their value chains, to deploy new business models, to be more resilient to environmental, social, and economic challenges.

For example, some new business models promote a transition from the concept "Pay to own" to the concept "pay to use", which reflects a new user's mind-set, based on the idea that resources are limited and, therefore, the use of products must be maximized.

[3] World Economic Forum

[4] Growth within: A circular economy vision for a competitive Europe

At a macroeconomic level, TC will help to integrate CE issues in products and services production and consumption. By providing a common understanding on CE and tools, TC will facilitate the dialogue and trade between the different stakeholders at national, regional or international levels. TC documents will help organisations to support their actions to implement CE in their activities toward their internal and external stakeholders.

Mobilization of the financial sector will be important in catalysing the transition towards CE.

Technical dynamics

CE is a generic concept that needs operational tools to be implemented. To promote this implementation these technical issues have to be addressed:

- Partnerships: are crucial to CE; no organization is able to implement a CE system alone;
- Integration: in CE all the possibilities of improvement of the resource efficiency should be considered in an integrated way (material and energy flows integration; biological and technical cycles integration);
- Infrastructure: need to build the necessary infrastructure to enable the sustainable flow of materials across value chains;
- Support companies and organisations to become more circular throughout their whole value chains, becoming more circular since the early stages of the development of products and services;
- Measuring and assessing circularity at materials, products and services, organisations and territorial level and its sustainability impact;
- Market conditions: to promote the use of CE products and services including CE principles, customers need transparent information on materials circularity and level of maturity;
- Specifications needed: to provide materials, products, services and solutions that consider circular economy principles in the market;
- Local synergies: to identify a match between circular resources and potential recovery sectors from a technical point of view;
- Innovations needed: to promote the use of recoverable resource, and stimulate innovation investments on materials, products and services that consider circular economy principles.To promote innovation in business models, technologies, products and services such as performance-based approaches are reducing adverse environmental and social impacts and providing sustainable development improvements;
- Improved data flows: for efficient material and energy flows to be enabled for the CE, data must likewise flow efficiently through the circular value chain, requiring transparency and traceability, while protecting privacy and confidential information.

Regulatory and legal dynamics

Regulatory and legal dynamics are key drivers to implement a CE along the value chain and within value networks.

Countries are leveraging established intergovernmental organizations (eg. OECD, UN) and establishing new ones to collaborate on policy efforts to evolve their regulatory framework mitigating risks to the environment. Similar activities are also happening within countries with varying levels of government, from federal to municipal. Such efforts tackle the depletion of the natural capital at levels ranging from local to global, and while progressive, also introduce inconsistencies due to their focus on meeting stakeholder needs.

Recently the focus has been to evolve legislative frameworks from a waste management focus, to managing material flows employing circular principles. New and updated regulations are making the costs associated with the linear economy more readily apparent to all value chain partners, including users, while setting targets to stymie material flow to the waste stream and disincentivizing waste-to-energy schemes.

Some of these efforts, however, are not optimized to efficiently transition towards CE, as they cater to the constrained needs of the involved regulatory and political stakeholders. Their needs tend to be siloed to the demands of local constituents, and don't include the broader context of the associated value chain, all resources and not only waste (Eg. Regulations setting targets on recycled content and incentivizing waste diversion, but not recognizing that the demand for waste diverted materials exist in other jurisdictions - see figure 5). But CE must include all resources and not only waste, deals with all value chains, innovation etc. Legislative effort also needs to address barriers to material flows within a country, and between countries.

Policy package type	Policy package characteristics	Typical policy instruments	Number of countries[a]
Basic waste management	No linkage between waste management and resource use	Basic provision for public service managing of wastes through landfilling or burning	7
Integrated waste management	Limited linkage between waste management and resource use	Collection and treatment of wastes, some limited usage of wastes	22
3R/waste hierarchy	Strong linkage between waste management and resource use	Implementation of the waste hierarchy (reduce, recover, recycle) in resource use and waste management	21
Circular economy	Complete integration of waste management and resource use	Reducing waste and pollution through design, maintaining materials in production and consumption cycles through reusing, recycling and recovering.	10

Figure 5 - Policy package types and national policy packages (a) from a sample of 60 states
Source - Journal of Cleaner Production (2020)

Social dynamics

Increasing awareness of the potential environmental and social impacts of products, processes, and services, are leading to decisions being made by both industry and users to consider perceptions of these impacts. Standards help stakeholders to implement CE in their products, processes, and services to understand the sustainability impact, to valorise CE implementation toward their stakeholders with transparent information and to collaborate throughout value chains and within economic sectors.

The complete implementation of the CE necessitates user engagement as an active part of the value chain. Welcoming users into the value chain as an active member, will require effort from the existing value chain – to educate; to facilitate active participation; to remove structural barriers; and to incentivize participation including Diversity Equity Inclusion concerns and principles; vulnerable society; indigenous concerns and principles factors; Users will need a broad

understanding of the drivers behind the circular economy and accept the fact that humans' current consumptive ways are unsustainable in a world of finite resources. This challenge cannot be understated, as evidenced by the current state of user participation in extended producer responsibility schemes around the world.

Crucially for CE implementations is to ensure no stakeholders, especially users, are left behind. Considerations and conscious effort must be made to include those users who are at risk of not being included as active participants in the circular value chain. At-risk users include those who live in poverty; are elderly; are illiterate; do not speak the native language; live in remote or socially-at-risk communities; etc. For populations already experiencing the adverse effects of climate change (extreme weather, etc.), or are marginalized in society, this will be a challenge. For countries with indigenous populations, where the level of trust in institutions is non-existent, this will be a challenge.

Customers' role in the circular economy will transition from today's consumption role to that of a dynamic and participatory role. The principles of diversity, equity and inclusion must be used to ensure all customers are represented – including those of traditionally marginalized groups, such as those living in poverty, minority populations, and indigenous peoples. With these principles ensuring no one is left behind, the transition to the circular economy will align to the objectives of the United Nations' Sustainable Development Goals.

Addressing social dynamics will be crucial to including users in CE implementations, and needs to be included in future work by the TC.

2.2 Quantitative Indicators of the Business Environment

The following list of quantitative indicators describes the business environment in order to provide adequate information to support actions of the TC. The following is intended as a summary of current state-of-the-art environmental and social indicators.

These indicators provide an overview of some boundary conditions where CE transition may offer a concrete contribution.

"Where we stand" part is based on data and facts including:

- The Earth Overshoot Day (Figures 6 and 7);
- The Stock Check, estimated remaining world supplies of non-renewable resources (Figure 8);
- The limit of natural resources illustrated by the Periodic table of elements (Figure 9);
- Global income and wealth inequality (Figure 10);
- The poorest half lags behind: Bottom 50%, middle 40% and top 10% income shares across the world in 2021 (Figure 11);
- Global income inequality: Between vs. within country inequality (Theil Index), 1820-2020 (Figure 12);
- Global carbon inequality, 2019. Group distribution to world emissions (%) (Figure 13);
- The extreme poverty (Figure 14);
- Human Development Index, ecological footprint and country profile (Figure 15);
- The multiple benefits resource efficiency policies (Figure 16).

"Time to act" part shows expected benefits of a CE.

Where we stand

The Earth Overshoot day[5] marks the date when humanity's demand for ecological resources and services in a given year exceeds what Earth can regenerate in that year.

We maintain this deficit by liquidating stocks of ecological resources and accumulating waste, primarily carbon dioxide in the atmosphere. This day comes earlier and earlier every year (figure 6). Note that countries contribute differently to the overshoot day (figure 7).

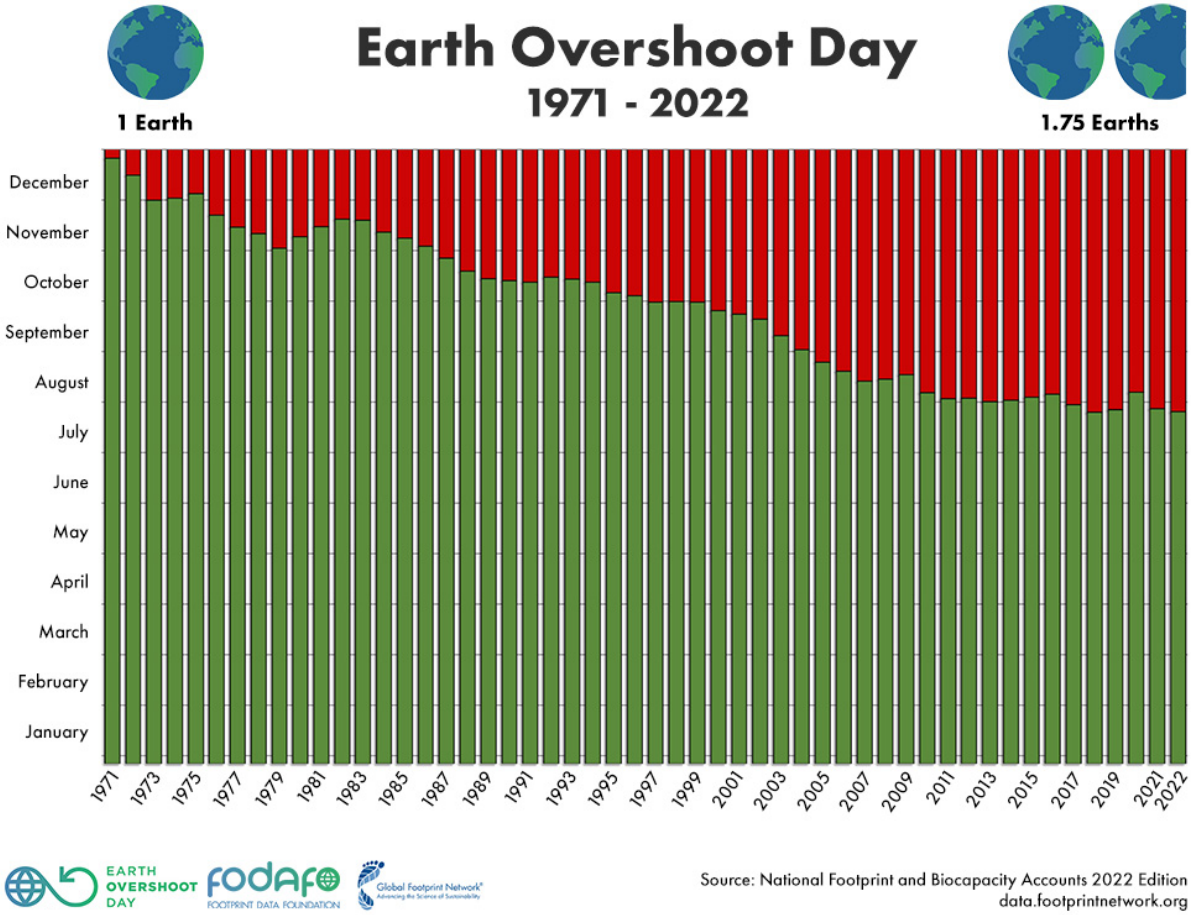


Figure 6 - Earth overshoot day from 1971 to 2022

[5] https://www.footprintnetwork.org/our-work/earth-overshoot-day/

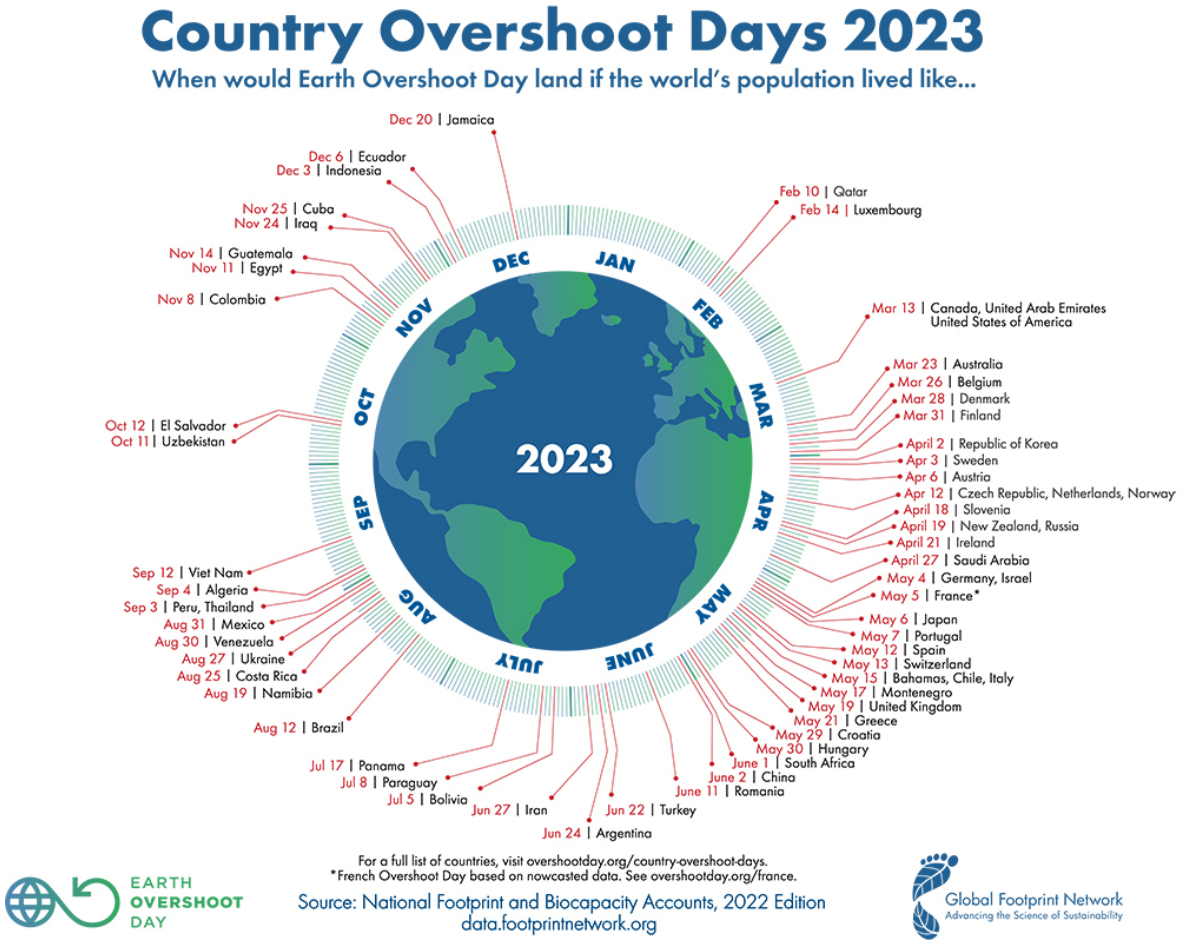


Figure 7 - Earth overshoot day by country in 2023 - https://www.overshootday.org/newsroom/country-overshoot-days/

That means we excess consume all non-renewable resources, e.g. ores, rare earths, oil and gas, sand, land … and we excess generate pollution and waste without enough concern.

To illustrate this excess consumption, see the below infographic[6] which estimates the remaining stocks of non-renewable resources such as minerals, fossil fuels and ecosystems considering a business as usual approach:

[6] iibstudio (https://beyondwordsstudio.com/) – 2012 – UN TEEB, US Geological survey, BP, Worm et al (2006), London Metal Exchange. Figures are worldwide. Living natural resources dates are worst case based on published estimates. Minerals and fossil fuel data based on known reserves currently economical to extract, assuming fixed % increase in usage per year. No provision made for changes in demand caused by new technologies, discoveries of new reserves or market forces. Agricultural land means land suitable for rainfed cultivation net of other land usage. Thirty-year historic agricultural expansion rates are applied.

Source: http://www.bbc.co.uk/bbc.com/future/BBCF_infoData_stock_check.pdf

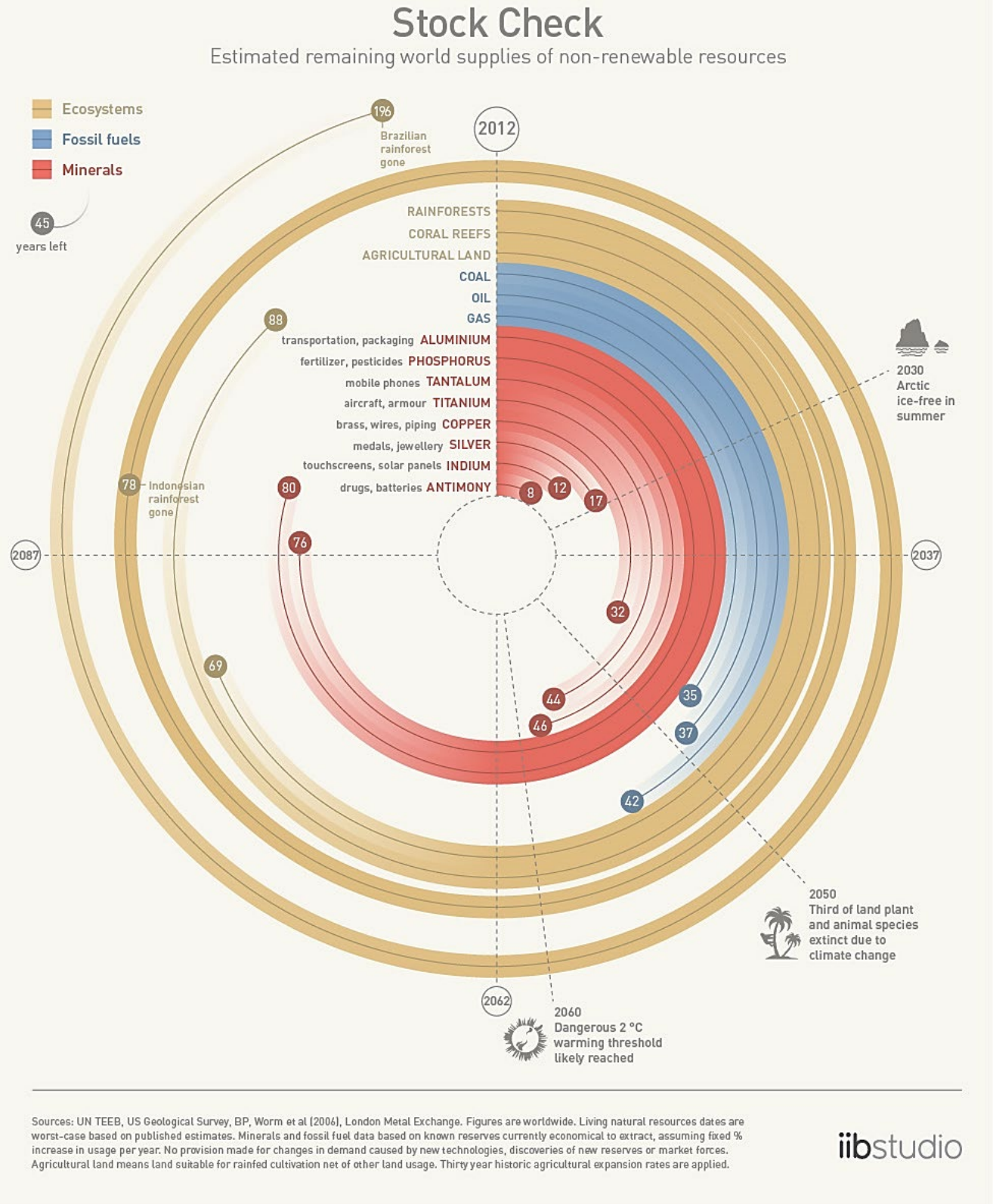


Figure 8 - Estimated remaining world supplies of non-renewable resources. Source UN TEEB, US Geological survey, BP, Worm and al (2006)

To complete and precise the above Stock Check, the periodic table below the shows the risk of exhaustion of mineral resources over the next 50 years, with current production and consumption patterns:

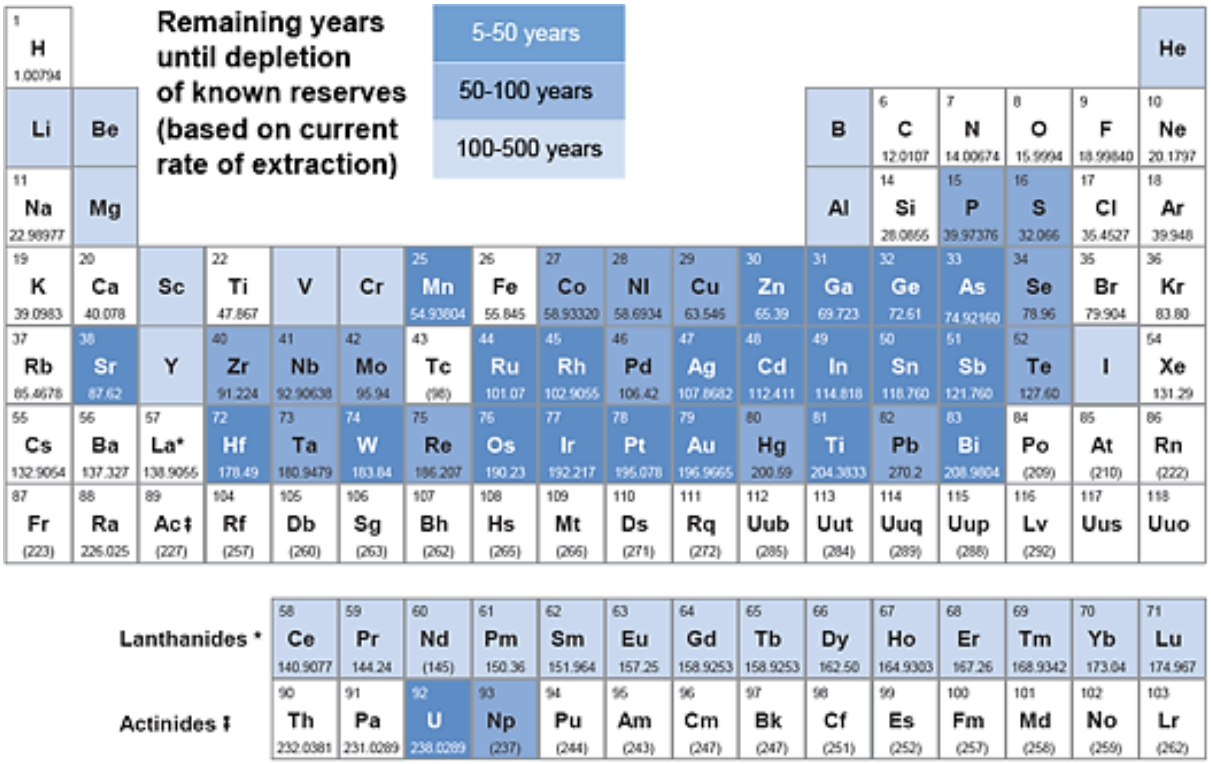


Figure 9 - Supplies of key resources are limited.
Source Hunt, A. J. (ed.), Element Recovery and Sustainability, RSC Green Chemistry Series, Cambridge, 2013.

To complete the picture and illustrate the over waste generation, it has been established by the World Bank[7] that:

- An estimated 2.01 billion tons of municipal solid waste were generated in 2016 in the world, and this number is expected to grow to 3.40 billion tons by 2050 under a business-as-usual scenario;
- Recyclables make up a substantial fraction of waste streams, ranging from 16% paper, cardboard, plastic, metal, and glass in low-income countries to about 50% in high-income countries. As countries rise in income level, the quantity of recyclables in the waste stream increases, with paper increasing most significantly;
- Globally, about 37% of waste is disposed of in some type of landfill, 33% is openly dumped, 19% undergoes materials recovery through recycling and composting, and 11% is treated through modern incineration."

This demonstrates human activities impacts on ecosystems especially by waste generation[8]. At the same time, humans may also be negatively impacted by such environmental changes.

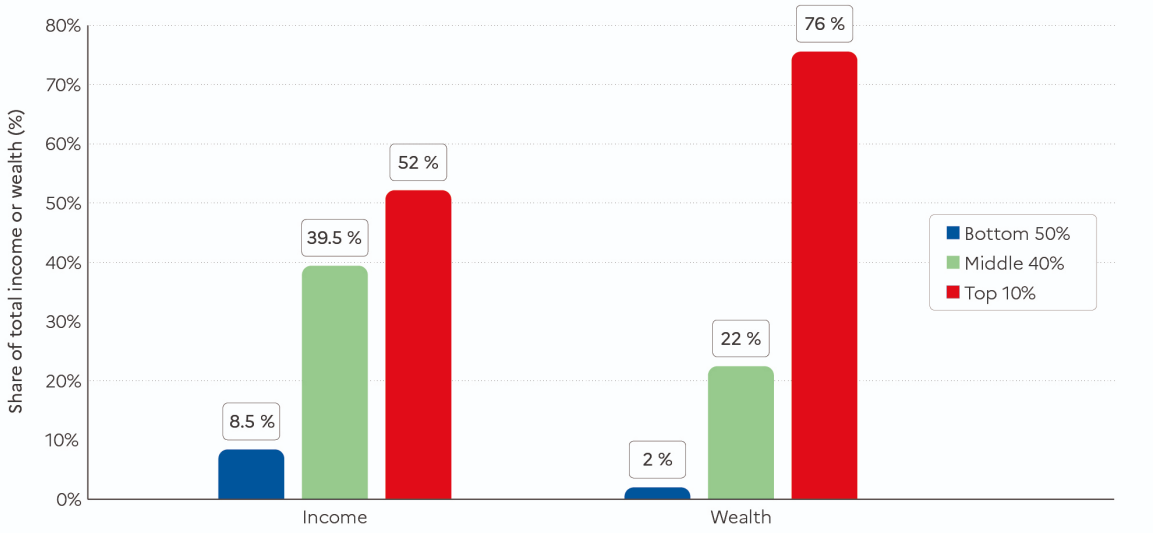
No less importantly, account must be taken of economic inequality amongst people, between countries and within countries. According to the World Inequality Report 2022[9], "global wealth inequalities are even more pronounced than income inequalities. The poorest half of the global population barely owns any wealth at all, possessing just 2% of the total. In contrast, the richest

[7] What a waste 2.0 – A global snapshot of solid waste management to 2050 – World Bank - 2018

[8] Other human activities' strong impacts are on ecosystems, climate and biodiversity by not using resources in a circular way.

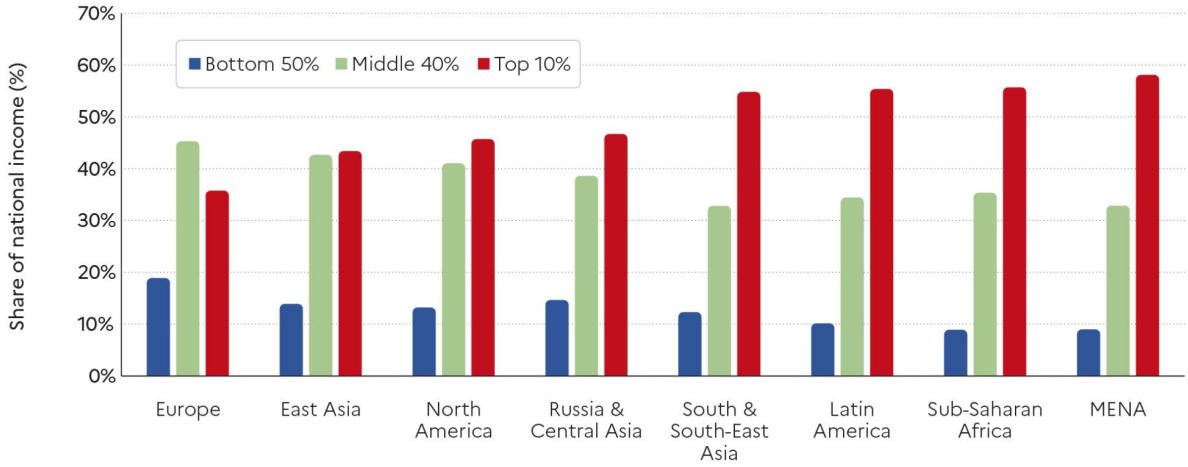
[9] https://wir2022.wid.world/

10% of the global population own 76% of all wealth" (figure 10). The figure 11 shows income inequality levels across the regions.



Interpretation: *The global bottom 50% captures 8.5% of total income measured at Purchasing Power Parity (PPP). The global bottom 50% owns 2% of wealth (at Purchasing Power Parity). The global top 10% owns 76% of total Household wealth and captures 52% of total income in 2021. Note that top wealth holders are not necessarily top income holders. Incomes are measured after the operation of pension and unemployment systems and before taxes and transfers.* ***Sources and series:*** *wir2022.wid.world/methodology.*

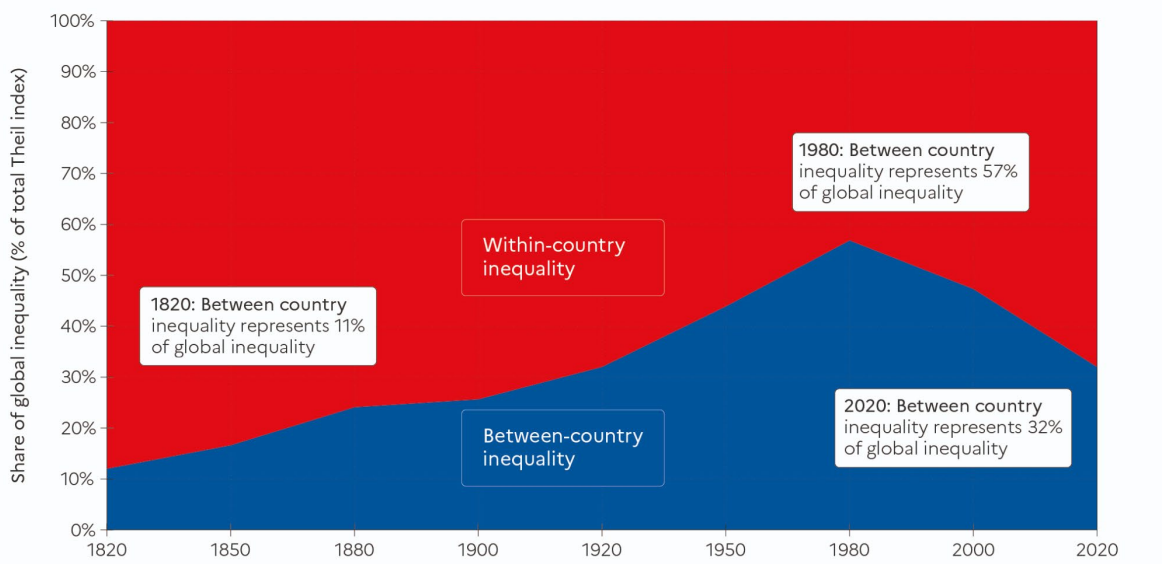
Figure 10 - Global income and wealth inequality, 2021



Interpretation: *In Latin America, the top 10% captures 55% of national income, compared to 36% in Europe. Income is measured after pension and unemployment contributions and benefits paid and received by individuals but before income taxes and other transfers.* ***Sources and series:*** *www.wir2022.wid.world/methodology.*

Figure 11 - The poorest half lags behind: Bottom 50%, middle 40% and top 10% income shares across the world in 2021

The World Inequality Report 2022 mentions that over the past two decades, "inequalities increased significantly within countries. The gap between the average incomes of the top 10% and the bottom 50% of individuals within countries has almost doubled, from 8.5x to 15x. This sharp rise in within-country inequalities has meant that despite economic catch-up and strong growth in the emerging countries, the world remains particularly unequal today. It also means that inequalities within countries are now even greater than the significant inequalities observed between countries." (Figure 12).

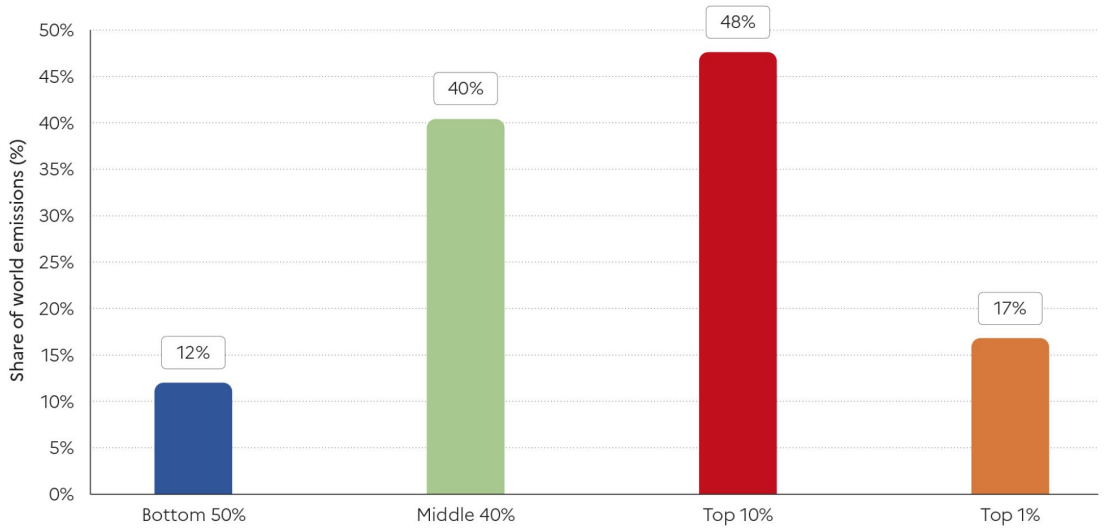


Interpretation: *The importance of between-country inequality in overall global inequality, as measured by the Theil index, rose between 1820 and 1980 and strongly declined since then. In 2020, between-country inequality makes-up about a third of global inequality between countries. The rest is due to inequality within countries. Income is measured per capita after pension and unemployement insurance transfers and before income and wealth taxes.* ***Sources and series:*** *wir2022.wid.world/methodology and Chancel and Piketty (2021).*

Figure 12 - Global income inequality: Between vs. within country inequality (Theil Index), 1820-2020

The World Inequality Report points out the “global income and wealth inequalities are tightly connected to ecological inequalities and to inequalities in contributions to climate change. On average, humans emit 6.6 tonnes of carbon dioxide equivalent (CO2) per capita, per year.”

Data set on carbon emissions inequalities reveals important inequalities in CO2 emissions at the world level: the top 10% of emitters are responsible for close to 50% of all emissions, while the bottom 50% produce 12% of the total (figure 13).



Interpretation: *Personal carbon footprints include emissions from domestic consumption, public and private investments as well as imports and exports of carbon embedded in goods and services traded with the rest of the world. Modeled estimates based on the systematic combination of tax data, household surveys and input-output tables. Emissions split equally within households.* ***Sources and series:*** *wir2022.wid.world/methodology and Chancel (2021).*

Figure 13 - Global carbon inequality, 2019. Group distribution to world emissions (%)

But in the meantime, we note that extreme poverty decreased to approximately 10% in 2015 of the overall earth's population[10] (figure 14):

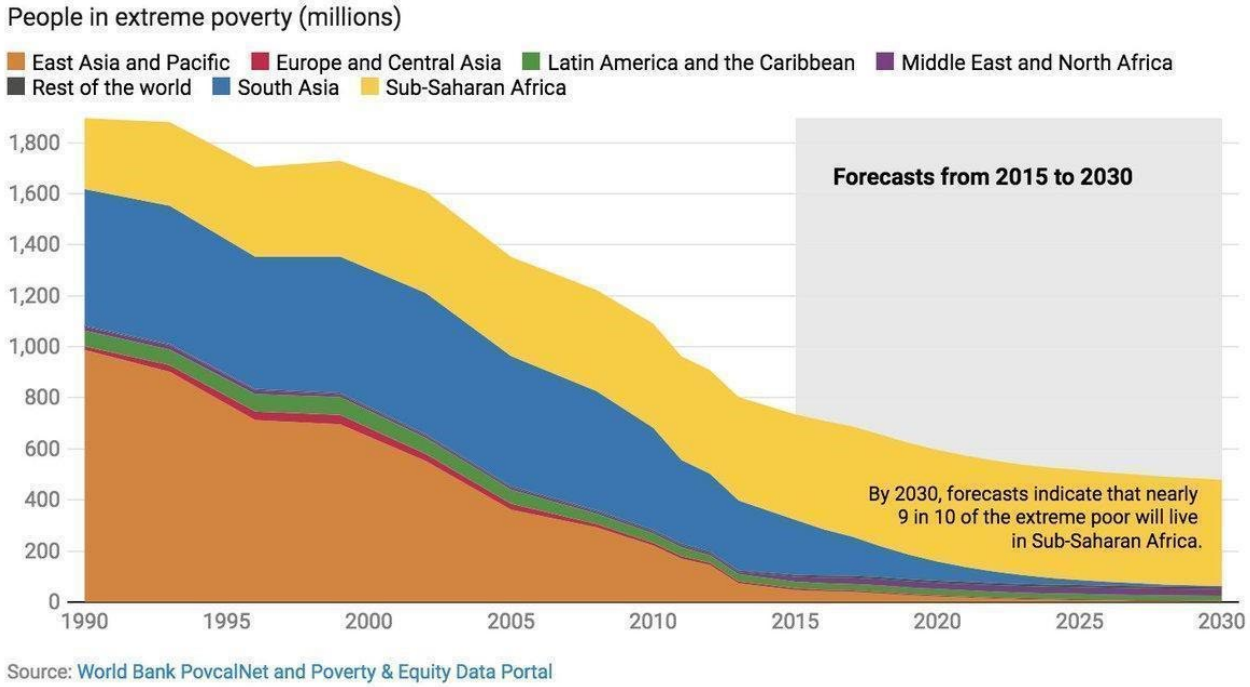


Figure 14 - People in extreme poverty, 1990 - 2030

As per the figure 14, the data and reports show that a large majority of people live better. A lot of improvements have been made during the last decades. The challenge is to combine economic, social and environmental development by further improving social aspects without environmental depletion.

In addition to economic inequality and environmental challenges, social challenges have to be considered to implement a CE. These challenges can be summarized using the Human development index (HDI). HDI is a measure of the standard of living of a citizen: having a higher HDI means higher standard of living therefore higher good consumption and more waste generation.

Country profile allows prioritising circular solutions based on countries' performance on human development and ecological impact (figure 15).

[10] https://www.worldbank.org/en/news/feature/2018/12/21/year-in-review-2018-in-14-charts

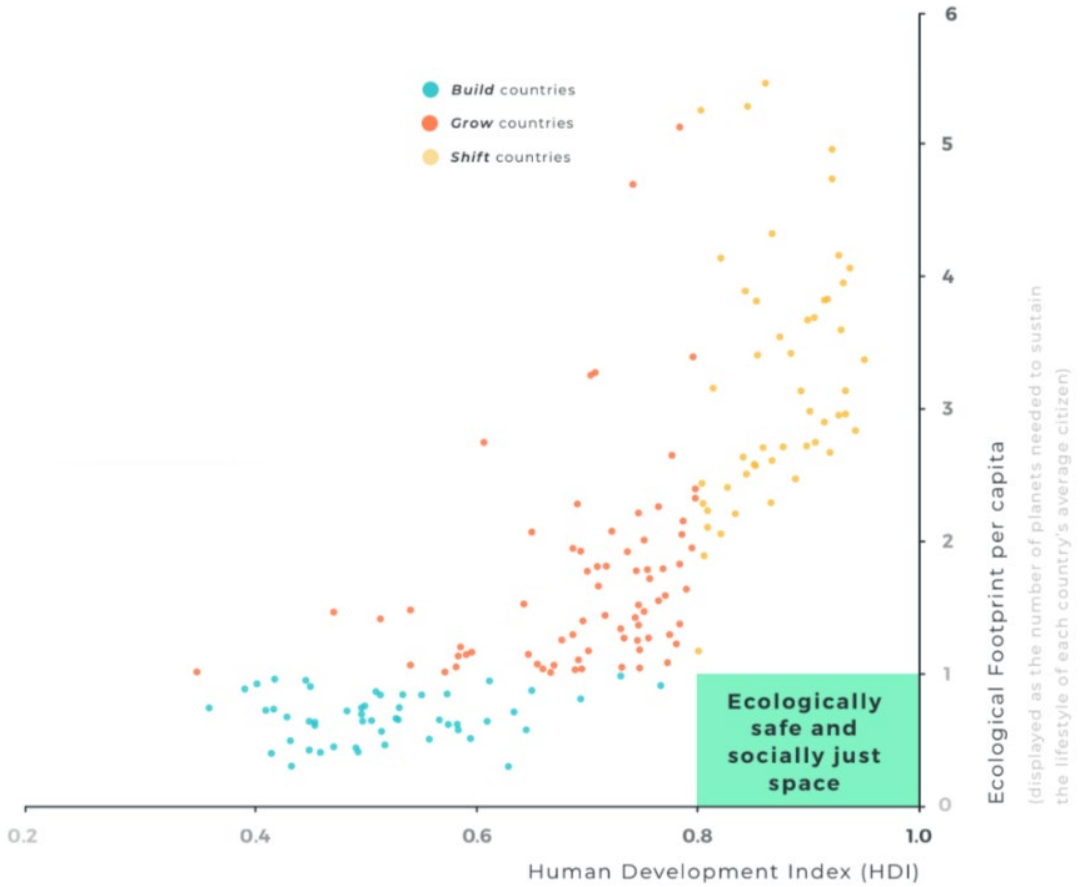


Figure 15 - HDI, ecological footprint and country profile - Source: https://www.circularity-gap.world/2023

Circularity Gap Report proposes 3 countries' type to implement specific circular solutions:

- **"Build countries** live within planetary boundaries, but still need to build an economic system that satisfies their society's basic needs.They are home to 46% of the global population. They currently transgress few planetary boundaries, if any at all, but struggle to meet their basic needs, such as education and healthcare, and therefore score low on Human Development Index (HDI) indicators. Their economies are dominated by agriculture and forestry, and they are building basic infrastructure. The Build profile is most relevant to countries in Sub-Saharan Africa, South Asian countries and some small island states. The larger countries by population to which the profile may apply are India, Bangladesh, Ethiopia, Nigeria, Pakistan and the Philippines.

- Largely middle-income, **Grow countries** need to continue growing in a way that satisfies their societal needs, but within planetary boundaries. They are home to 37% of the world's population, and are industrialising rapidly and building infrastructure to lift their populations out of poverty and accommodate a growing middle class. They are global manufacturing hubs and the world's biggest agricultural producers. They use 51% of materials and generate 41% of emissions. The Grow profile is most relevant to countries in Latin America and Northern Africa, as well as those with an economy in transition in Eastern Europe, the Caucasus and Central Asia, plus larger Southeast Asian countries. The largest countries in this group are China, Indonesia, Brazil, Mexico, Vietnam, Myanmar and Egypt.

- Higher-income **Shift countries** need to shift away from over-consuming the planet's materials in servicing their relatively affluent and comfortable lifestyles (although

inequalities within Shift countries are rife). They are home to a minority of the world's population but consume 31% of materials and generate 43% of emissions. Per capita, Shift countries are the largest customers across all material groups; their extraction of fossil fuels is relatively high, as is their participation in global trade. So, despite high HDI scores and comfortable lifestyles, these countries have a way to go to limit their consumption in line with our planet's boundaries. The Shift profile fits best with the higher-income countries in the Global North, in the Gulf, Australia and Oceania. The larger ones include the US, Japan, Canada, Argentina and Member States of the European Union."

For more detailed information about solutions by country's type, see: https://www.circularity-gap.world/2023.

Time to act

CE is pointed out as a model that brings relevant contributions to support a more sustainable development by several stakeholders such as organizations[11], governments, cities and civil society.

Gathering figures of CE benefits is a complex task. But the International Resource Panel[12] modelled the economic and environmental consequences of ambitious resource efficiency and greenhouse gas abatement policies in the G7[13]. The results show that resource efficiency policies and initiatives could have some multiple benefits as presented below:

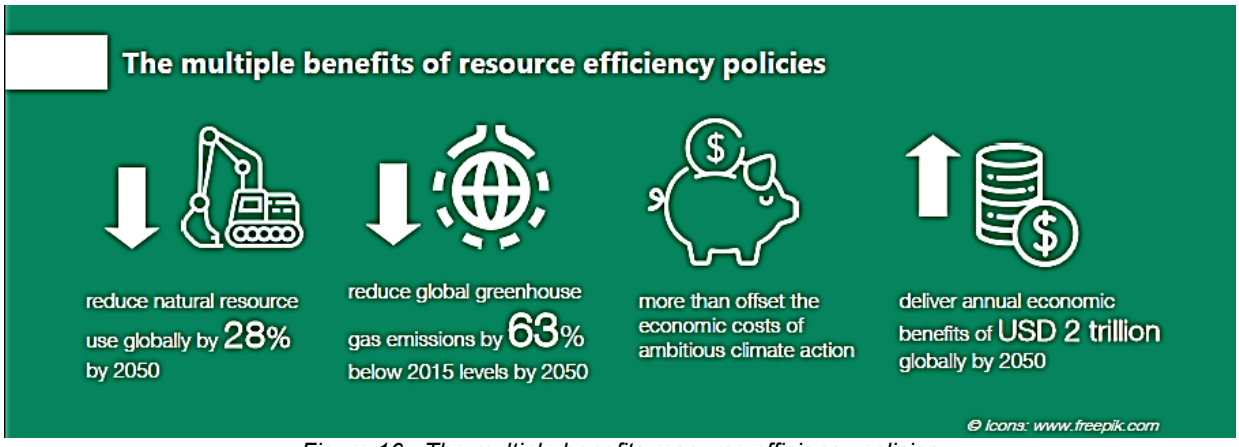


Figure 16 - The multiple benefits resource efficiency policies

In another publication[14], the International Resource Panel estimates: « Resource Efficiency is practically attainable and there are many opportunities for its improvement in low, middle and high-income countries. It is estimated that 60 to 80% improvements in energy and water efficiency are technically possible and commercially viable in construction, agriculture, food, industry, transport and other sectors compared to conventionally used technologies. This would deliver economic cost savings of 2.9 to 3.7 trillion USD per year by 2030. In 70% of cases, the required resource efficient investment would offer a rate of return greater than 10 per cent per year. Investing some USD 900 billion could potentially generate 9 million to 25 million jobs. »

[11] https://www.ellenmacarthurfoundation.org/

[12] https://www.resourcepanel.org/

[13] UNEP, 2018 - Resource efficiency for sustainable development: Key messages for the Group of 20 – Reflections from the International Resource Panel

[14] UNEP, 2016 - Resource Efficiency: Potential and Economic Implications - Summary for Policy-Makers

So moving together towards a CE could deliver benefits such as:

- Reducing our pressure on the ecosystems: raw material demand, greenhouse gases emission, biodiversity, waste/water/energy management…;
- Stimulating innovation and creating jobs;
- Developing beneficial and productive networks between stakeholders and enhance collaboration and value sharing.

3 Benefits expected from the work of the ISO/TC 323

TC proposes to maximize the contributions of organisations to sustainable development by developing standards to implement CE in their activities and in collaboration with partners and key stakeholders. This also includes international organizations.

The committee's work will advance the development of international documents for the CE, focusing on requirements, frameworks, guidance and supporting tools related to the implementation of CE projects.

The work done by this committee will directly impact the productivity of those using the standard. The current linear economic model is overexploiting natural capital. The CE economic model promises to reduce resource consumption, end the overexploitation of natural resources, by managing and regenerating natural resources in a sustainable way, securing the quality and resilience of ecosystems. . As said previously in "Economic dynamics" it was estimated that employing circular economy practices would translate to a GDP increase of 7%. Governments are investing heavily in building capabilities and capacity to develop and sustain the Circular Economy.

Due to the global nature of supply chains, CE endeavours would not be jurisdictionally limited – therefore collaborating to develop international norms for conducting CE projects is vital for the success of this standard. Governments around the world recognize that the linear economic model is not sustainable – and are increasingly developing strategies, roadmaps, and incentives to transform their economies with CE principles. Businesses are undertaking similar transformations – and the leading organizations are expecting trading partners to have Circular Economy capabilities. Increasingly, businesses are not just looking at social responsibility credentials of their trading partners, but also asking pointed questions to potential partners on how their business practices mitigate environmental risks.

It is essential for organizations to have CE capabilities to remain competitive globally. It is expected that CE principles will be topical in cross-jurisdictional relationships and will be enshrined in future international trade agreements (like human rights and social responsibility requirements). Such relationships will require shared foundational understanding that the work of this TC brings.

The TC deliverables will:

- Promote improved and globally shared understanding of CE;
- Provide a common framework to support any organizations integrating CE principles and strategies in their activities;
- Develop a common understanding on how to monitor, measure, assess and communicate circularity performance;
- Facilitate dialogue, communication and collaboration amongst stakeholders at international, regional and national levels;

- Show concrete benefits and actions that interest potential stakeholders and contributors;
- Provide guidelines for the creation of an enabling environment for collaboration within and among sectors and value chains;
- Making products accessible to more customers through circular-based business models;
- Facilitate exchanges and feedback on experiences;
- Provide easy to use documents to implement CE and avoid proliferation of standards;
- Avoid greenwashing and misleading claims about the circular aspects of an organization or a system;
- Contribute to a change of mindset, which will help build a systemic approach that promotes the maintenance of the circular flow of resources.

The added value of the TC program is an integrated and global vision of CE. It leads organizations to make the best strategic choices and use the right tools.

4 Representation and participation in the TC

4.1 Membership

Membership list including organizations in liaison to TC CE is available here : https://www.iso.org/committee/7203984.html.

There is meaningful representation from developed countries, developing countries and countries with economies in transition. 97 countries are part of the TC in May 2023.

4.2 Analysis of the participation

This TC promotes the broadest participation of ISO and liaison members.

It met for the first time in May 2019, in Paris. More than 120 delegates from 47 countries were present which can be considered as an amazing participation for a first meeting. Then the second and third committee meetings have been held virtually due to the COVID-crisis. A strong participation has been registered. The 4th committee meeting was hosted by Rwanda in September 2022: 174 experts from 61 countries attended this hybrid meeting (half on site, half virtually).

The TC promotes the participation of developing countries and is encouraging them to contribute and take responsibilities in the Committee. As an example, WG2 is led by a twinning team: Japan-Rwanda. Mauritius took the co-convenorship with Switzerland of Joint WG14 (ISO TC207 SC5 and ISO TC323) to develop a standard related to secondary materials.

TC leadership works with ISO's Capacity Building Unit to train developing countries and reinforce their capacity to participate actively in the TC. Capacity building sessions have been organised for each physical Committee meeting and TC management will encourage them for coming TC meetings.

Participation in TC is also open to International organizations. Today more that 15 organizations joined the Committee, such as:

- ECOS (Environment) - European Coalition on Standard;
- EMF - The Ellen MacArthur Foundation;
- GRI - Global Reporting Initiative;

- ITU - International Telecommunication Union;
- SBS - Small Business Standards;
- UNIDO - United Nations Industrial Development Organization;
- WCSD - World Business Council for Sustainable Development;
- WCO - World Customs Organization.

For a better understanding and implementation of CE, committee management invites any interested person to contact its National Standardisation Body to join the Committee (www.iso.org/members). For liaisons, International organizations are invited to contact the committee manager to join the works. .

5 Objectives of the TC and strategies for their achievement

TC develops International Standards and other documents in support of an alternative and future oriented economic model by giving a common understanding of what CE is, identifying new business models and establishing a framework and tools that any organization can adopt to help them integrate CE within their activities in an effective and systematic manner.

TC aims at acting pragmatically and operationally to contribute to give a quick and consistent answer to the environmental and social needs.

The scope of TC is (https://www.iso.org/committee/7203984.html):
“Standardization in the field of circular economy to develop frameworks, guidance, supporting tools and requirements for the implementation of activities of all involved organizations, to maximize the contribution to Sustainable Development.

Excluded: Aspects of Circular Economy already covered by existing committees.
Note: In parallel, the ISO/TC 323 works in cooperation with existing committees on subjects that may support Circular Economy.”

The 5 objectives of the TC and strategies for their achievements are:

Objective 1: To develop standards that support and encourage organizations to adopt circular economy through a time-efficiency process

Strategies to achieve this:

- Ensure the practical applicability and added value of the deliverables, making sure they address real-life challenges to unlock opportunities for the CE (growth of green markets, opportunities through value chain thinking, environmental benefits through reduced, efficient and effective use of resources, managing natural resources sustainably to contribute to the regeneration of ecosystems);

  The current set of standards ISO 59004, 59010 and 59020 will be published beginning 2024 and ISO 59040, ISO 59014 end of 2024. Considering the level of maturity of CE implementation in organizations, considering the difficulty to transition from a linear to a circular economy, the revision of these standards will be needed rapidly after publication. To achieve this revision, the first step could be running a survey gathering return of experiences that will support the revision process for more operational and pragmatic standards. This survey would be achieved during the year following publication. This survey would integrate organizational, business issues, opportunities and risks as well as practices that will help the transition to CE (see figure 17).

- Adopt pragmatic and operational project management and efficient decision-making to be able to deliver consensual and widely approved texts;
- Be inclusive with all stakeholders as an essential part of delivering globally;
- Avoid duplication of work between the TC, existing and future WGs and other ISO/TCs;
- Promote transparency and inclusiveness of the standards development process.

Figure 17 - TC roadmap 2024-2025 (the revision itself has to be validated by a TC323 ballot)

Objective 2: To promote an alternative and collaborative economic model that is more sustainable and facilitate the transition towards circular economy

Strategies to achieve this:

- Identify new alternative business models to linear one integrating life cycle thinking and long term-based value;
- Promote inter sectoral collaboration to achieve innovation (both technical and social);
- Develop standards considering all stakeholders along the value chain.

Objective 3: To promote a broad and effective participation from countries all around the world and encourage organizations and its representatives to adopt a circular mindset

Strategies to achieve this:

- Take into account the interest of all regions of the world (developing and developed countries);
- Include representatives from all continents in the Chair Advisory Group;
- Encourage attendance at in-person meetings through the ISO programmes for developing countries;
- Organize plenary meetings in all continents;
- Promote virtual, hybrid and physical meetings to allow a wider participation;
- Facilitate sponsorships;
- Promote liaisons with external organizations;
- Use social networks for communication;
- Develop skills for collaborative thinking:
  - Make clear that circular solutions can not be achieved on its own, without collaboration
  - Explain how collaboration works and its benefits
- Write the standards recommending inclusiveness and multi stakeholder participation.

Objective 4: To maximize the contribution to Sustainable Development

Strategies to achieve this:

- Set ambitious principles for contributing to sustainable development;
- Consider interrelation amongst environment, economic and social systems all together in the standards developed by ISO/TC 323;
- Continue to assess and communicate which UN SDGs are supported by the ISO/TC 323 standards.

Objective 5: To develop high quality standard for all types of stakeholders

Strategies to achieve this:

- Develop various ISO deliverables (International Standards, Technical Specifications, Publicly Available Specifications, Technical Reports, International Workshop Agreements) corresponding to the various needs;
- Develop horizontal and structuring documents (Terminology, principles) and operational ones (Management System Standards, cases studies, measurement methods, …);
- Develop operational tools to monitor the effective implementation of circular economy such as decision aid tools, indicators, measurement, and assessment methods…;
- Consider all scales: materials, processes, resources, products & services and organisations;

- Develop standards for all sectors, all stakeholders, all organisations of all types and sizes adapted with their maturity degree moving to a more harmonised approach for providing reliable information related to circularity, increasing simplification and reduction of administrative burdens, especially for Small and Medium Enterprises;
  TC 323 encourages its members to submit New Work Item Proposals in order to address the specific needs of specific stakeholders groups including SMEs..
- Ensure the consistency between Working Groups and between TC and other TCs (The CAG is helpful for that purpose);
- Synergy with the options under the other ISO TC and Liaison organisations;
- Promote transparency and inclusiveness during the elaboration process.
- In case of New Work Item Proposals, not cause conflict with other existing standards. Consideration shall be given to co-operation with other bodies wherever possible by providing a process to take into account available information on environmental, social and economic systems and give full account of the impacts of their requirements.
- Update this Strategic Business Plan as required to reflect the business and business environment in which the TC is operating.
  The TC further recognizes that CE is a dynamic and evolving subject, so care will be taken to ensure that standards remain up to date and do not impede innovation. There are different kinds of standards for different situations and the TC will monitor the development of standards to ensure that requirements are appropriate for the intended circumstances.

Objective 6: To communicate about ISO/TC323 works to encourage their use

Strategies to achieve this:

- Create a communication group which will report to the TC management or CAG;
- Implement a communications strategy and channels that reach wider communities of interest such as national mirror committees, professional institutions, public sector and trade bodies to develop awareness, promote circular mindset and encourage the use of TC documents
  The communication group will define a strategy that can include:
  - TC LinkedIn page creation to highlight the activities and accomplishments and to seek additional experts;
  - Newsletter including a Chair's message;
  - Virtual webinars which show case existing standards and new initiatives and highlight challenges;
  - Post real-life profiles of how the standards have helped users and include their recommendations for improvement.
  - Provide an infographic/visual to better explain what CE is.

6 Factors affecting completion and implementation of the TC work programme

A number of factors (both challenging and supportive) are expected to come into play in terms of completing the TC work programme, and further on in implementation at national level of the standards.

As the degree of implementation of circular solutions is still relatively low in several business sectors, there is a clear need of defining the concept and the aspects it entails, and dissemination of this knowledge. This in turn will enable transitioning towards increased circularity and building knowledge in collaboration with other actors.
A first factor is the fairly recent creation of the TC. National standardization bodies need time to create networks, find suitable experts in the field and explain the purpose and work program of

the TC. CE is especially challenging in the sense that it requires a wide range of stakeholders and sectors in order to encompass all aspects.

Solutions to this:

- A pedagogical approach during and between meetings;
- The availability and contribution of TC leadership;
- The promotion of the harmonization between countries having the same issues;
- The strengthening of the capacities of developing countries in coordination with ISO programmes;
- Engage stakeholder groups on how to get involved and contribute actively.

A second factor is the lack of resources, both expertise and financial, which is a recurring theme among the member bodies in standardization. Because the CE is new and complex, this factor is reinforced. This may result in differing levels of national prerequisites to implement ISO standards at national level.

Solutions to this:

- Organize plenary meetings in different localisations all around the world;
- Facilitate sponsorships;
- Engage stakeholders;
- Use external communication strategies.

A further challenge in implementing is the risk of the deliverables being too resource intensive to implement at organizational level. All types of organizations, but Small and Medium Enterprises in particular, are facing challenges to allocate resources in the best ways possible. This may be further compounded by geopolitical and financial aspects, such as the energy crisis and inflation. The effect may be that simpler solutions of circular transformation are used instead of the comprehensive 59000-series.

Solutions to this:

- Provide information and support to all types of organizations on how to approach the standards
- Add visualization of the circular economy to easier gain understanding
- Promote the benefits of a well-established circular economy in the long run

In all standards development, a common challenge is time. Reaching consensus globally, especially in a complex topic such as CE, is time consuming. Development of standards can be considered too slow in a topic where the demand is vast, risking the deliverables are irrelevant or less ambitious compared to national initiatives and legislation.

From 2019, the development of standards in TC was heavily affected by the Covid 19 pandemic. Global lockdowns made meeting face to face impossible, and all national standards bodies had to switch to digital solutions to meet. This has had a severe impact on finding consensus and working forward effectively, given the large number of experts that are engaged are spread over all continents and time zones. In late 2022, the pandemic situation improved and enabled meeting face to face again. This resulted in great progress of the work and will be the preferred meeting mode in continued work.

Solutions to this:

- Face to face meetings will be the preferred meeting mode;
- Changing continents enable physical attendance from member bodies from all continents.

Given the complexity of the subject and the interdependency of the work conducted in TC and its Working Groups, one challenge to finish the work programme has been to find alignment between all experts in the working groups. This also risks becoming a challenge in the implementation of the standards, as they have a presupposed logic that needs to be understood by the user of the standards.

Given the large number of member bodies involved, it is unavoidable that some aspects of the drafts are contentious. Potentially differing perspectives may lead to lower implementation or even development of other standards deviating from the ISO standards.

Solutions to this:

- Continue Alignment workshops which have been conducted between the working groups to enable alignment in the drafting period;
- Provide information and training material to provide guidance to intended users of the standards;
- Promote unifying standards developed at both ISO and CEN level by using the Vienna Agreement wherever possible and to uphold a collaborative culture between all relevant groups.

In the long term, we expect integration of global socio-economic issues like climate change to influence the development of the work. Nations that are heavily affected, as well as nations active in adaptation, will have to take natural systems as the model for economic development to maintain human well-being and preserve the natural environment.

Solutions to this:

- Enable participation from all types of nations by e.g. hybrid meeting forms;
- Highlight the contribution of standards in sustainable development;
- Underline the need of transitioning towards circularity as part of meeting the ongoing climate crisis, as committed to by ISO's signing of the London Declaration.

In Africa, the private sector is increasingly pushing for regulation to enable circularity. Governments are promoting circular enterprises, and in general companies are asking for clarity that is provided by legislation. The misalignment between sectors on which solution, or what combination of solutions, is best suited to enable transitions towards circular economy creates challenges that reach beyond standardization activities and highlights the need of regional and national strategies.

Furthermore, the current legislation and strategic management of resources creates a core challenge to implementing new standardization that is developed in a circular mindset. Existing legislation developed in a linear line of thinking introduces complexity at national and regional level to apply and combine the different mindsets. The relationship between stakeholders in private and public sectors is complex and transversal and value chains and value networks reaches beyond national and even regional boundaries. The implementation of the standards on circular economy will therefore need dedicated review of existing and developing policy and legislation and a promotion of standards as an essential part of policymaking.

Solutions to this:

- Standards can inspire a certain direction of legislation, information activities may be needed;

- The private sector is encouraged to absorb the standards and by implementing the frameworks and influence legislation.

7 Structure, current projects and publications of the TC

Information on ISO online: The link below is to the TC 323's page on ISO's website **https://www.iso.org/committee/7203984.html**

In 2019, TC was structured into four Ad Hoc Groups to develop the first formal proposals of work items based on consensus, then Working Groups were created.

In 2023, 5 Working Groups managed the standardisation work to produce the ISO 59000 series (figure 17 and annex B).

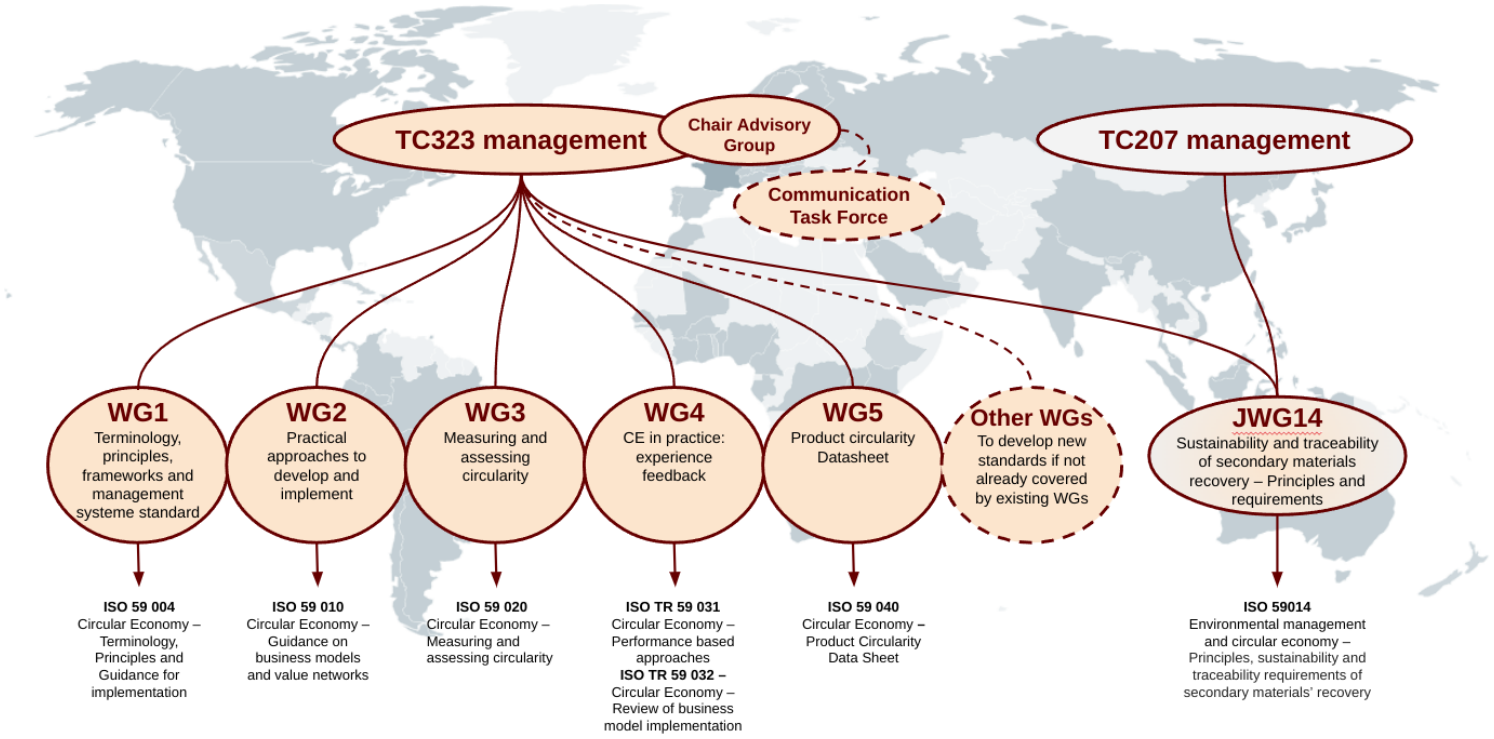


Figure 18 - TC existing and potential structure

TC decided to create a Chair Advisory Group (CAG) in order to ensure consistency, to support the Technical Committee and to avoid duplication of Working Groups or between TC and other Technical Committees. For the coming period, a communication Task Force will be created to promote TC works.

When needed, alignment workshops open to TC members are planned to solve specific challenges that are raised by WGs. These workshops are managed under TC leadership.

Reference information
Glossary of terms and abbreviations used in ISO/TC Business Plans
General information on the principles of ISO's technical work

ANNEX A
Example of national political dynamics

At the national level, circular economy policy dynamics can be both transversal, global dynamics and/or dynamics focusing on more specific actions such as reuse, remanufacturing, banning single use, etc.

Note: This list is not an exhaustive list of national political dynamics. A specific benchmark document could be developed to present a state of the art regarding political/legal texts.

- Brazil has strong regulations regarding environmental issues and the use of natural resources. The Brazilian Constitution of 1988 has a specific chapter on the environment, which states: “Everyone has the right to an ecologically balanced environment, an asset for common use by the people and essential to a healthy quality of life, imposing on the Government and the community the duty to defend and preserve it for present and future generations”. In addition, there is a set of laws related to the environment, such as: National Environmental Policy, National Solid Waste Policy, National Water Resources Policy, National Basic Sanitation Policy, Brazilian Forest Code, to name a few. Issues related to circular economy are spread between those national laws, with emphasis on the National Solid Waste Policy, which brings elements such as reverse logistics, shared responsibility, product life cycle, sustainable production and consumption patterns, among others.

- Canada has embraced the CE as a pillar to achieving its broad sustainability goals, including its commitments to the UN SDGs.
  https://www.canada.ca/en/services/environment/conservation/sustainability.html

- CE Promotion Law of the People's Republic of China – first tabled in 2008, and came in force in 2018. The law is intended to address some of the unintended consequences of China’s rapid growth, while setting the environmental tone for sustained growth.
  https://leap.unep.org/countries/cn/national-legislation/circular-economy-promotion-law-peoples-republic-china

- France has published in 2020 its Anti-Waste and CE law designed to be overarching and cross-sectoral leading to circular practices from production, through the behaviour of users to waste management, reuse and recycling.
  https://buildingcircularity.org/the-french-approach-to-circular-economy-and-coherent-product-policies/
  Part of this law, the repair index was rolled out in 2021. This tool aims to provide better information to customers on the more or less repairable nature of their purchases.

- Japan established its Basic Act for the Establishing a Sound Material-Cycle Society in 2000, representing a similar concept to the circular economy. The government has followed with planning reports every five years since 2003 (the latest published in 2018), setting out targets for material flows and resource productivity. Japanese businesses have followed with similar plans. https://www.env.go.jp/content/900452892.pdf

ANNEX B
TC Working Groups and their scopes

WG	Title	Scope as defined and validated by TC323 in 2021
1	Terminology, principles, frameworks and management systeme standard	In a first instance, it addresses circular economy concepts, related definitions, principles and frameworks for implementation. In a second instance, it supports the development of a Management System Standard for circular economy. Note to the future deliverables: - Provide definitions and terminology for a common understanding of circular economy, framework and principles - Define frameworks and principles of circular economy - Provides frameworks for the implementation of CE in the three dimensions of sustainable development: economic, social and environmental -Consider an integral perspective of life cycle thinking along the value chain e.g. resource extraction, production of products and services, usage of products and services, new life management - Contribute to sustainable development
2	Practical approaches to develop and implement	Addresses approaches on how to develop and implement business models and value networks that contribute to the transformation towards a circular economy. Note to the future deliverables: - Includes externalities and enablers such as education, social infrastructure, behavioural changes, natural environment, sustainable procurement and finance. - Helps practical and operational implementation of circular economy concepts and frameworks, including guidance, e.g; - how to foster new businesses that is design as circular - how to redesign already existing business models to become circular - how to build partnerships and promote the necessary changes to the circular economy implementation and foster network perspective - how to share information in the value network/chains - how to systematically minimize food loss issues - how to utilize sustainable finance - Contribute to sustainable development
3	Measuring and assessing circularity	Addresses measuring and assessing circularity by providing guidance and requirements Note to the future deliverables: - Applies an integrated view of circularity and sustainability and is intended to support the transition towards CE; - Build upon existing ISO Standards, especially the ISO 14000 series. Duplication and inconsistencies will be avoided - Contribute to sustainable development
4	CE in practice: experience feedback	Addresses by searching, identifying and analyzing specific issues identified by ISO TC323. Provide related support documents such as case studies and best practices. Note to the future deliverables: - WG4 support documents that can help others of TC323 identify best practices around the world about uses cases in CE area and support the WG's understand these practices to write the standards

		- WG4 documents could be related to business models (including products and services) in accordance with WG's needs - Contribute to sustainable development
5	Product circularity Data Sheet	Develops a document that establishes the principles and procedures for the creation, maintenance and verification of a Product Circularity Data Sheet for efficient exchange of data throughout supply chain networks. It provides adequate guidance on the type, content and format of information to be provided to: 1. Support the design of circular and healthier products 2. Support the implementation of cost-effective circular business models
Joint WG14	Sustainability and traceability of secondary materials recovery – Principles and requirements	Develops a standard that provides a framework for the sustainable management of secondary materials considering valuable materials. The framework includes sustainability (Social aspects will be considered, with respect to the transition from informal to formal sector) and traceability requirements for economic operators recovering valuable materials from all kinds of waste streams.

These Working Groups produce the following standards:

The ISO 59000 series of documents as March 2023

<table>
<tr><td colspan="4">WG1 (lead by Brazil-France)
ISO 59004 – Circular Economy – Terminology, Principles and Guidance for implementation</td></tr>
<tr><td>WG2 (lead by Japan-Rwanda)

ISO 59010 Circular Economy – Guidance on business models and value networks</td><td>WG3 (lead by Netherlands)

ISO 59020 Circular Economy – Measuring and assessing circularity</td><td>WG5 (lead by Luxembourg-China)

ISO 59040 Circular Economy – Product Circularity Data Sheet</td><td>JWG14 (lead by Switzerland-Mauritius)

ISO 59014 Environmental management and circular economy – Sustainability and traceability of secondary materials recovery – Principles and requirements</td></tr>
<tr><td colspan="4">WG4 (lead by Brazil - secretariat Kenya)

ISO TR 59031 – Circular Economy – Performance based approaches
ISO TR 59032 – Circular Economy – Review of business model implementation</td></tr>
</table>