

Materials & Products Taskforce

Green Circularity:
Advancing the EU's
climate goals through a
Circular Economy

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CLG Europe Taskforce for Climate Neutral and Circular Materials and Products

The Taskforce for Climate Neutral and Circular Materials and Products was created by CLG Europe in September 2021, with the aim of driving forward policy action on sustainable materials by bringing together a group of progressive businesses across sectors and value chains. The group brings together companies that are actively committed to producing and using climate neutral and sustainable materials, and who want to work together to promote and support EU-wide measures to decarbonise material production and use.

We Mean Business Coalition

The We Mean Business Coalition is a non-profit coalition working with the world's most influential businesses to take action on climate change. The Coalition is a group of seven non-profit organisations: BSR, CDP, Ceres, CLG Europe, Climate Group, The B Team and WBCSD. Together, the Coalition catalyses business and policy action to halve emissions by 2030 and accelerate an inclusive transition to a net zero economy by 2050.

Authors

Kirsten McNamee, Tahmid Chowdhury and Salomé Lehtman (CISL).

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Introduction

The EU has recently made great strides towards meeting its climate goals. However, less focus has been placed on the key role that a circular economy plays. This paper highlights the critical role that building a circular European economy plays in meeting the EU's climate goals. Furthermore, this paper sets out that the challenges and recommendations for policymakers to speed up the transition to a circular economy.

Over the past year, progress has been made. CLG Europe's Taskforce for Climate Neutral and Circular Materials and Products (the Taskforce) warmly welcomed the EU's newly proposed Ecodesign for Sustainable Products Regulation, part of the EU Circular Economy Action Plan, which can be a key framework Directive to drive change. For maximum impact, however, there is also a need to address wider issues, and to help resolve a series of challenges that businesses encounter when driving to become more circular and sustainable.

Furthermore, the wider political context highlights the importance that building a circular economy plays for the EU. Russia's invasion of Ukraine has plunged Europe into an energy and climate crisis, which underlines the importance not only of reducing dependence on fossil fuels and increasing energy efficiency but also of ensuring resilient supplies and the smart use of all materials.

The policy context in the EU

In March 2020, the European Commission presented a central component of the European Green Deal, the Circular Economy Action Plan (CEAP).¹ It advocates for more sustainable product design, waste reduction and consumer empowerment to help decouple economic growth from resource use. By February 2021, the European Parliament had adopted a resolution on the new CEAP, requesting additional measures to achieve a fully circular economy by 2050. Whilst welcoming the CEAP, Members called on the Commission to propose binding targets for 2030 to reduce the EU's raw material and consumption footprints.

The CEAP announced initiatives along the entire life cycle of products, targeting the way they are designed, promoting circular economy processes, encouraging more sustainable consumption and aiming to prevent excessive waste. The plan lists 35 actions in various areas, including plastics, waste and recycling, critical raw materials, sustainable products and textiles.

The Commission has recently proposed a package of legislative measures as previously announced in the CEAP. The proposal includes: the Ecodesign for Sustainable Products Regulation, the Review of the Construction Product Regulation, the EU Strategy for Sustainable and Circular Textiles and the Empowering Consumers for the Green Transition legislation. As set out in our analysis published in June 2022, the Materials and Products Taskforce broadly welcomes these initiatives as a potential enabler for businesses to develop more sustainable material use. Nevertheless, additional clarity and further policy measures in certain areas are necessary to fulfil the Circular Economy Package's potential for greater ambition and progress on the transition to a climate neutral economy through competitive sustainability.²

The role a circular economy in achieving climate goals

Lindahl and Dalhammar define circular economy as “an economic system that uses a systemic approach to maintain a circular flow of resources, by regenerating, retaining or adding to their value, while contributing to sustainable development”.³ It focuses on value creation, optimises resource use and emphasises a ‘reduce, reuse, recycle’ waste management system.

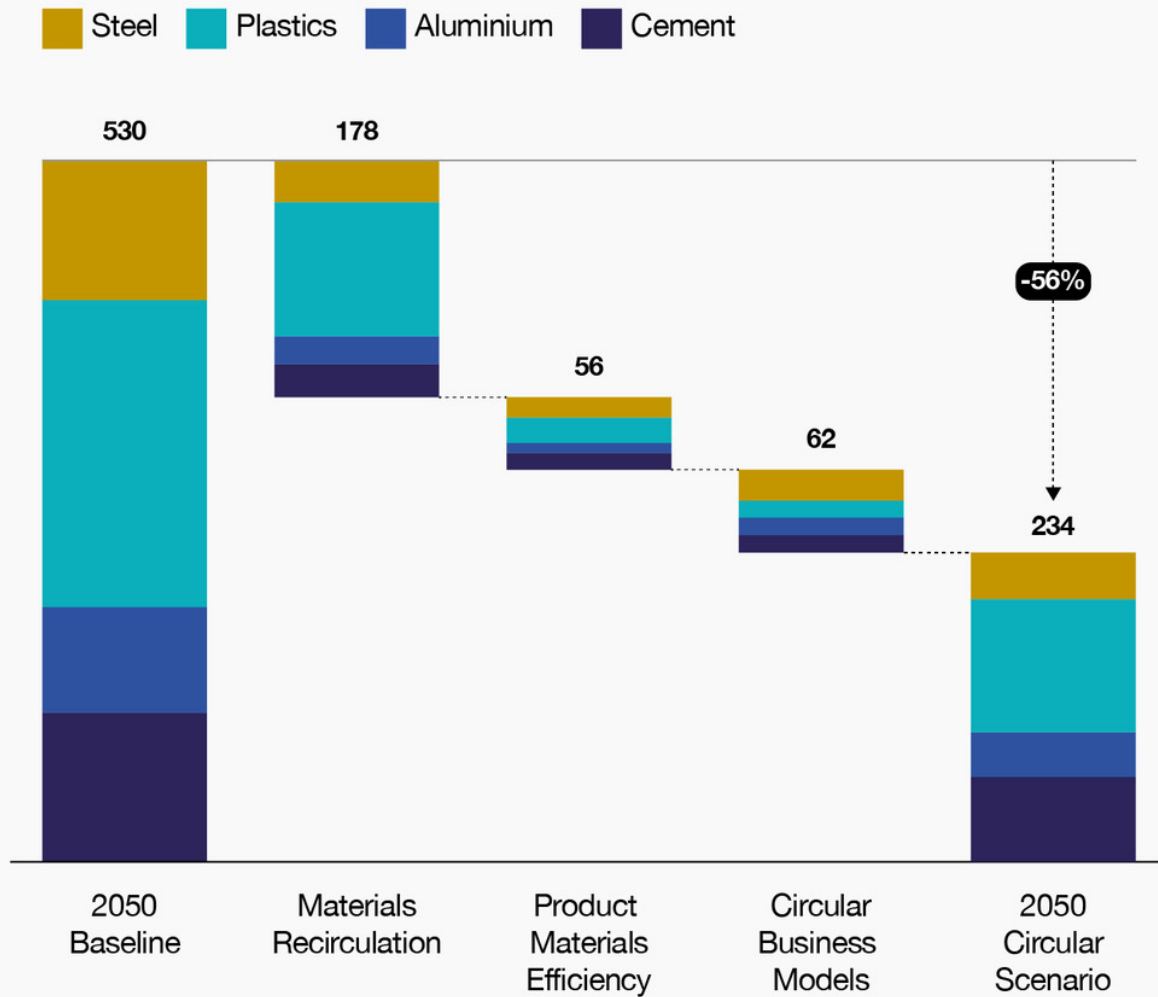
Measures to tackle climate change have often focused on the transition to renewable energy, complemented by energy efficiency. The roll-out of critical renewable energy infrastructure, decarbonising transport and improving energy efficiency have been major EU priorities even before the European Green Deal. These measures do play a critical role in the climate transition, but they most directly address only 55% of emissions, and have less impact on the remaining 45% of emissions.⁴

Fewer measures tackle these remaining 45% of emissions deriving from material production – these emissions come from producing the cars, clothes, food and other products we use every day.⁵ However evidence increasingly shows that a circular economy is a cost-effective and systemic way to address this challenge and ensure that the world remains on track to limiting temperature rise to 1.5°C.⁶ As material consumption is expected to increase eightfold in the 21st century while raw materials are growingly scarce, it is vital to rethink our economic processes and move towards a more regenerative design.⁷

Commitments to more circular and sustainable economies have been ramped up internationally but country ambitions from Nationally Determined Contributions (NDCs) will need to increase fivefold to meet the necessary global emission reduction targets. Failing to make this fundamental shift means that Member States will not achieve net zero by 2050 nor meet the requirements for a 1.5°C scenario.⁸ The Intergovernmental Panel on Climate Change (IPCC) estimates that only around 800 billion tonnes (Gt) CO₂ emissions can be emitted up until 2100 if we are to keep warming below 2°C. However, materials production alone is set to emit 900 Gt based on current trends.⁹ Measures to tackle climate change have focused on the energy and transport sectors. And rightfully so, as these sectors represent around two thirds of EU greenhouse gas (GHG) emissions, according to 2020 data.¹⁰ By applying circular economy principles to the mobility, food and built environment sectors alone, Europe can reduce its emissions by as much as 61% by 2050.¹¹

Material Economics’ report ‘The Circular Economy – a Powerful Force for Climate Mitigation’ highlights that a more circular economy can make deep cuts in emissions from steel, plastics, aluminium and cement.¹² In an ambitious scenario, this could be a 56% reduction – as much as 296 million tonnes (Mt) CO₂ per year in the EU by 2050, out of 530 Mt in total.

EU Emissions Reductions Potential from a More Circular Economy, 2050 Mt of Carbon Dioxide per Year



EU Emissions reductions potential from a more circular economy 2050. Source: *The Circular Economy – a Powerful Force for Climate Mitigation (2018)*.¹³

The EU needs to embark on an entire system overhaul to significantly reduce emissions, a process that will require greater ambition beyond current policy measures. A new circular economy will play a key part in this.

The role of progressive business and the circular economy

Organisational interest in environmental management has been growing worldwide, with businesses being encouraged to act towards avoiding and/or reducing the adverse effects of poor environmental performance evident in both production and consumption.¹⁴ The European Investment Bank (EIB)'s 2021 survey shows that 58% of European firms are exposed to physical climate risks, but also that most European firms are optimistic about how the green transition will impact their activities.¹⁵ Businesses can

take on the responsibility to defend the environmental and sustainable values of society, as they can demonstrate how the circular economy is, in fact, the solution to more sustainable development.¹⁶

One way that businesses can make this shift is by changing from production to service. An example of this is the company MUD Jeans¹⁷, which rather than selling jeans rents them. People can rent a pair of jeans for a year and repairs are free. Another example is RePack,¹⁸ which provides a packaging service for e-commerce, designing packages that last at least 20 cycles whilst also removing excess waste packaging. We are seeing a growing number of ways in which businesses are adapting to a circular model to ensure more sustainable practices that reduce resource consumption and achieve commercial viability.

Creating products that reduce harmful emissions

Businesses can be the designers of circularity. For example, they can create some categories of products that maintain their value after each use and avoid obsolescence.

Looking at plastic packaging, applying refillable designs to all the bottles in the home cleaning, beauty, and personal care sector would lead to savings on packaging and transport amounting to an 80–85% reduction in GHG emissions compared with the single-use bottles currently available.¹⁹ Unilever has been revisiting its approach to packaging to use less, better or no plastic. For instance, by developing concentrated formulations the company encourages its consumers to think of bottles of cleaning and laundry products as a 'bottle for life' – Cif and OMO customers are encouraged to reuse their bottles through ultraconcentrated products they can dilute at home. Diluting the product at home means 97% less water being transported, 87% fewer trucks on the road and less greenhouse gas emissions. Similarly, Dove's refillable steel deodorant case launched in 2021 is expected to reduce virgin plastic waste by around 30 tonnes within its first year.²⁰

Signify, a Dutch lighting corporation, is seeking to replace plastic packaging completely by the end of 2022. This will avoid the use of 2,500 tonnes of plastic annually, which is the equivalent of 125 million PET bottles. As the new, alternative packaging is also smaller, the company will reduce carbon emissions from transport and materials by 6,000 tonnes per year.²¹ Data shows that there has already been a EUR 0.2 million decrease in societal costs through its efforts to eliminate plastic in consumer packaging, based on their methodology for calculating societal impact. In addition to Signify seeing a reduction in costs, 21–25% of its revenue in 2021 was derived from its circular economy portfolio. Circular economy can prove not only good for society, but good for business as well.

ROCKWOOL is a Danish multinational manufacturer of stone wool products, of which a key attribute is that it can be fully recycled into new products – infinitely, and without any loss in performance. In 2021, three-quarters of ROCKWOOL's stone wool manufacturing facilities had eliminated all stone wool waste going to landfill. In addition, recycling reduces the carbon intensity of production on average by 10%. ROCKWOOL also upcycles annually well over half a million tonnes waste from other industries, such as slag from steel production, which further improves the energy efficiency and thereby the carbon intensity of its production. By recycling waste and transforming it into new products, the demand for primary raw materials is reduced, reducing the overall environmental impact of the built environment.²²

The circular economy can help tackle industry emissions and further accelerate the transition to a net zero economy. Around 21% of global CO₂ emissions derive from industry, with the production of cement, steel, plastics and aluminium being responsible for 60% of these emissions. High-temperature heat processes, production and end-of-life emissions are the main sources of CO₂. A circular economy offers cost-effective ways to reduce emissions by shifting energy-intensive industrial processes towards remanufacturing and recycling – which are much easier to decarbonise and often powered by renewables.²³

Moving up the 'waste hierarchy', as outlined by the EU's Waste Directive, towards increased recycling and away from landfilling can lead to significant reductions in GHG emissions. If Member States increased their recycling of solid waste, a reduction of over 6% of global GHG emissions could be achieved.²⁴ Plastic has the greatest untapped potential to improve circularity. Recycled plastics represent only 10% of plastics in the market, when in fact over 50% of plastic volumes can be mechanically recycled and a further 11% chemically recycled.²⁵

More than 60 Mt of CO₂ per year are emitted by the flat glass and container industries, which combined make up 80% of glass production.²⁶ Saint-Gobain, a French manufacturing company, has now achieved zero carbon production of flat glass. By focusing on circularity, and using 100% recycled glass available from demolition and renovation sites, along with 100% green energy,²⁷ Saint-Gobain has created ORAÉ®.²⁸ For every 4 mm of this new glass substrate, it leaves an estimated carbon footprint of only 7 kg CO₂ eq./m².

The momentum towards circularity is also growing fast in the aluminium sector. The demand for aluminium is growing, and the EU's stock per capita will have to increase 80% by 2050 to meet this need. The production of aluminium is energy-intensive, and in scenarios where electricity production is decarbonised more slowly than envisioned by the goals of the Paris Agreement, emissions from aluminium production would rise to 1.5 Gt of CO₂ per year.²⁹ Hydro, a Norwegian aluminium and renewable energy company, has produced 130 tonnes of near-zero carbon aluminium from 100% post-consumer aluminium scrap in its plant in Luxembourg this year.³⁰

Challenges encountered by businesses

Progressive businesses are taking the traditional business model, which describes a framework of how firms create value and deliver value to customers and developing that architecture further by implementing circular strategies that prolong product life cycle and close material loops.³¹ This innovation change process should be made as smooth as possible for enterprises of all sizes. To do this, it is first important to acknowledge emerging barriers. The list below is not exhaustive, but it addresses some of the most frequently referenced problems highlighted by businesses in recent studies.

Achieving the necessary financing

To obtain higher investment levels in climate and a circular economy, some of the challenges cited are barriers to the availability of finance as well as uncertainty. Transitioning to a circular economy business model requires new investment and funds to allow for greater research and development, new technological innovation and the development of new markets.³² Evidence from the EIB's 2022 survey shows that firms in countries that were most affected by the 2008 sovereign debt crisis say that access to funds is a key obstacle for their businesses. These countries are also shown to have fewer firms investing

in climate change mitigation measures. Uncertainty about the future means that businesses are less likely to allocate funds for climate investments. If uncertainty is reduced, more businesses will feel comfortable in investing towards climate action.³³ Currently, the EIB does not mention the idea of circularity at all when discussing investment in climate action, demonstrating that the idea is not yet well harmonised.

Businesses have identified low prices of virgin materials, for example fossil-fuel-based plastic being cheaper than bio-based plastic, and high upfront investment costs as key barriers to becoming more circular. The outstanding need for learning curves could result in losses for trailblazing businesses and large financial gains for the companies that follow, thus creating a waiting game.³⁴

There are case studies of financial measures that can stimulate the national uptake of sustainable practices. For example, by reducing the percentage value-added tax (VAT) on repair services to stimulate consumer engagement in circularity, as Sweden did in 2017.³⁵ More work is to be done to link investment and growth plans with a shift towards greater circularity, as currently the understanding in this space is lacking.

Knowledge and research gaps

Lack of clarity around commonly accepted definitions presents major challenges for businesses in the transition to circularity. The absence of an agreed standard of measurement for circular economy standards and metrics for circular materials and processes makes measuring or comparing success very difficult. It is not possible to develop improvement pathways for businesses and consumers if there is not enough research to inspire confidence or consensus on indicators to measure desired levels of circularity and overall environmental performance.³⁶

For example, further research is needed to better understand how different business models can support the shift towards a circular economy. There are also additional questions around the role of SMEs and start-ups compared with larger organisations when discussing the circular economy. Currently, the boundaries and synergies that exist between circular business models and sustainability are not being fully explored.³⁷ The EU can play a key role in gathering this necessary data, by better engaging with businesses through stakeholder consultations and building case studies as a means of sharing best practice. Furthermore, the EU can set clearer definitions in future legislation to build a greater common understanding of what we mean by a circular economy in Europe.

Consolidating the definitions and boundaries of this evolving concept, on a sector-by-sector basis, calls for a greater harmonisation of definitions and methodologies, as well as greater research in this area.

Support from consumers

Companies can be encouraged to shift their business models to more circularity if there is greater demand for sustainable products and production processes.³⁸ By taking a consumption-oriented approach to reducing GHG emissions that alters the behaviour and patterns of consumers, the EU's overall carbon footprint could be reduced by about 25%.³⁹ Changes in consumer behaviour can affect emission levels directly, for example by individual consumers altering their choices of vehicle or heating. Emission levels can also be targeted more indirectly by consumer behaviour, as emissions can be affected upstream, such as in the case of activities that produce consumer goods, or downstream, such as in waste disposal.

Consumers will play a key part in the transition to a more circular, sustainable economy. By making more sustainable choices and demanding more sustainable options, they can drive industrial change. For consumers to play an active role, they need to be informed. Consumer information and education in sustainability is fast developing, but a proliferation of different initiatives may also create confusion. There is a role for policy makers to support science-based labelling to engage consumers. Labels should educate and provide accurate information. 'Used' products still carry an unnecessary stigma that needs to be countered. Doubts often arise around second-hand products, with consumers questioning cleanliness and comparing their price against the price of newly produced goods. By rethinking the terminology around reused products, it should be possible to move away from this old logic and towards greater sustainability.⁴⁰

The need for a systems-wide approach

A circular economy represents a radical departure from our current 'take, make, waste' model, and will therefore require considerable systemic change and close co-ordination. Policymakers and businesses must take a joint approach to ensure the smooth inception of an industrial system that is intentionally designed to be restorative. This begins with initiatives like the Taskforce, whereby leading businesses from different sectors can highlight leadership examples that demonstrate how the circular economy can be shaped for the benefit of the EU and the world.

Adopting a circular economy model is critical for the EU's open strategic autonomy. The twin transition will require increasing amounts of various raw materials, and the EU's dependence on third countries, particularly China, for a number of those materials is even greater than that on Russia for fossil fuels.⁴¹ Securing the availability of critical raw materials within the single market through their continual reuse is paramount for the EU's resilience.

The European Commission's report on critical raw materials and the circular economy highlights the important role that circularity can play in ensuring security of supply, whilst also greatly reducing energy use.⁴² The following table demonstrates that the amount of energy used to produce metals from scrap compared with from ores can be over ten times lower.⁴³ There are also significant reductions in water use.

Metal	Energy use (MJ per kg of metal extracted)		Water use (m ³ per tonne of metal extracted)	
	Scrap	Ores	Scrap	Ores
Magnesium	10	165-230	2	2-15
Cobalt	20-140	140-2100	30-100	40-2000
PGM	1400-3400	18,860-254,860	3000-6000	100,000-1200,000
Rare Earths	1000-5000	5500-7200	250-1250	1275-1800

Energy and water consumption in the production of metals from scrap and ores (range given is high to low grade).

Source: European Commission, Report on critical raw materials and the circular economy.⁴⁴

Currently, the recycling rates of critical raw materials vary depending on the material. Whilst cobalt is being recycled at a rate of 35%, platinum group metals are being recycled at a rate of only 11% and other materials such as borate are not being recycled at all.

The implementation of a fully functional circular economy requires the right information to be available at the right moment for the right stakeholder. The upcoming Digital Product Passport (DPP) will allow information on the composition and life cycle of a product or material to be monitored and managed along the value chain. DPPs are expected to be the cornerstone of the EU's circular economy, as they will be key to enabling circularity in practice. However, shared responsibility will be required along the entire supply chain; thus, all actors, suppliers and manufacturers will need to work together to generate and communicate the relevant data.

The report on the DPP conducted by the Wuppertal Institute and the Materials and Products Taskforce⁴⁵ provides a detailed overview of the potential role of this tool and the expected benefits and challenges from a business perspective.

Examples of policy action

The EU has several policies in place to reduce waste and increase recycling. Designing and implementing regulatory instruments to increase recycling rates and reduce waste from packaging is challenging because it is derived from multiple materials and uses.⁴⁶ Although some broad regulations, such as the Single-Use Plastics Directive,⁴⁷ provide a combination of high-level and sector-specific requirements (including a 90% collection rate for plastic beverage bottles by 2029, and a minimum of 25% recycled

plastic in PET bottles from 2025).⁴⁸ Further materials are expected to be tackled in the upcoming Packaging and Packaging Waste Directive.

One policy instrument that can be especially successful in reducing beverage packaging waste and in increasing recycling rates and reuse is the Deposit Return System (DRS).⁴⁹ Under a DRS, a deposit fee is charged at the point of purchase, which is refunded to the purchaser when the packaging is returned via a specially designed system. DRSs can have extensive environmental benefits by reducing litter in cities and rural areas, and achieve high collection rates of around 90%.

Most DRSs in Europe are mandatory and apply only to certain materials and types of beverage packaging. Norway, however, operates a highly effective voluntary scheme that relies on tax exemptions to incentivise producer participation – the higher the collection rate, the lower the environment tax, which ceases to be charged when the collection rate reaches 95%. Interestingly, this scheme has been extremely successful, achieving return rates of over 90% on single-use plastics bottles and metal cans.⁵⁰

Conclusions and policy recommendations

Building a circular economy must be given the necessary attention and support it requires, so that economic activity and environmental and societal wellbeing can be successfully integrated. Businesses are currently facing several hard barriers, such as a lack of transparency across the supply chain, a lack of understanding from consumers and market uncertainty. External barriers such as insufficient capital and policy support also exist. We would like to make the following recommendations to show how policymakers can ensure a successful transition to a European circular and climate neutral economy:



Clarification on the meanings and metrics surrounding the circular economy concept are required if businesses are to see clear transition pathways to improve their circularity. Conceptual contention ultimately risks the circular economy concept being undermined. This clarification should be incorporated in further pieces of legislation on the circular economy that are to be announced by the EU, such as the Product Environmental Footprint and additional delegated acts as part of the Ecodesign for Sustainable Products Regulation.



Use of demand-side policy to create the necessary long-term demand for sustainable materials and products and services that is needed to boost business confidence. For example, CLG Europe and Agora Energiewende's report 'Tomorrow's markets today' sets out numerous policy options that could increase demand for carbon neutral products through greater transparency. One example could be the development of a standardised rating system and information tool for the CO₂ performance of basic materials, similar to Energy Performance Rating labels.⁵¹



Policymakers should build a greater link between stakeholder consultations and legislative outputs as they continue to develop and deliver the CEAP. Because of the gaps in research on circularity and varying business models, it is key that policymakers are constantly refreshing their understanding of latest technology and practices. This is an opportunity to strive for more tailor-made and effective policy. The European Circular Economy Stakeholder Platform is a positive step to bring different stakeholders together, and more could be done to ensure better sharing of knowledge and leadership from business and civil society.



Greater integration of financial and investment policy decisions with the promotion of circularity. This can be achieved by increasing understanding of the importance of circular practices within the finance community, whilst also ensuring that there is a strong understanding across different policymaking institutions of the benefits that fiscal measures can play in increasing circular practices.

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