

## Time to connect the dots: What is the link between climate change policy and the circular economy?

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### Key Ideas and Policy Recommendations

With the adoption of the Paris Agreement at COP21, global and EU climate change policy is entering a new phase. The ambitious target to limit global warming to well below 2°C and possibly even to 1.5 C above pre-industrial levels mandates substantial reductions in global greenhouse gas emissions and gives a new impetus to the EU's long-term objective to reduce GHG emissions by 80-95% by 2050 compared to 1990.

This CEPS Policy Brief shows that GHG emissions constitute some 80% of the global economy's output, making the atmosphere by far the largest site for the disposal of global waste. Given the direct physical relationship between the quantity of raw materials used in industrial processes and GHG emissions, policies aimed at limiting climate change must not only focus on reducing emissions but also on reducing the amount of raw material used as inputs to the global economy. Improved resource efficiency, greater recycling and re-use, as well as an absolute reduction in the use of raw materials must thus become a key element of climate policy in the context of the circular economy.

In December 2015, the European Commission published the new Circular Economy Package, containing a host of initiatives to reduce waste and to increase the longevity of products and materials, but it failed to set a headline target for reducing the EU's use of resources. Such a target could help to increase political attention and visibility of the issue, stimulate long-term ambitions and streamline the action of all actors – both public and private – towards reducing the consumption of natural resources.

In order to gain political support for such a target, this CEPS Policy Brief highlights two preconditions that need to be obtained:

- i. First, the target needs to be based on an attractive vision for change shared by a majority of stakeholders (including business and industry).
- ii. Second, it needs to be based on robust and consistent indicators across the EU – both on the public and on the company level.

Meeting these two preconditions will considerably ease the introduction of a policy mix aimed at fostering more circular business models.



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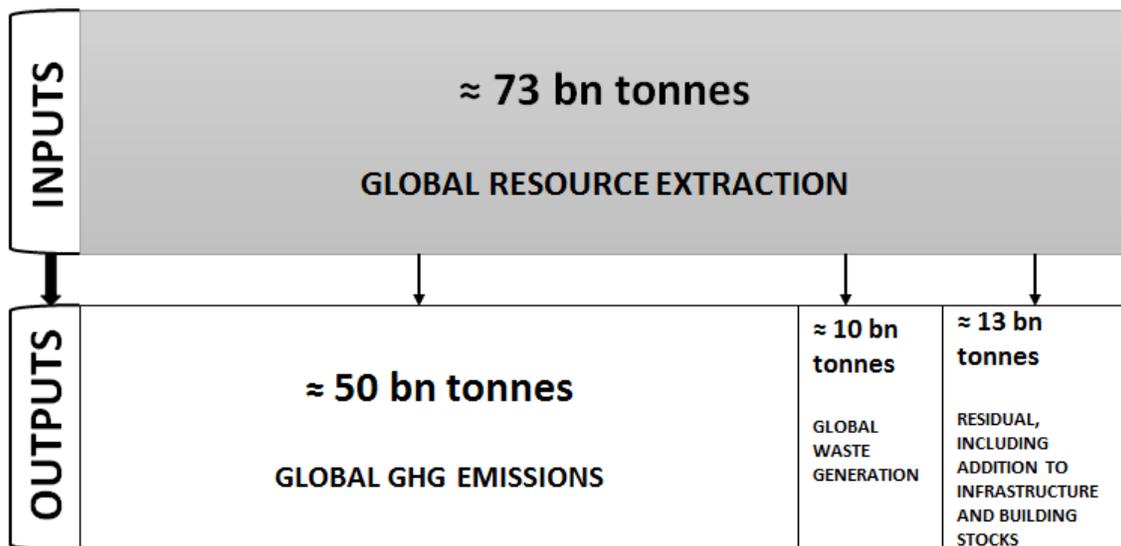
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## 1. The potential of the circular economy to reduce greenhouse gas emissions

The publication of the Circular Economy Package on 2 December 2015 (European Commission, 2015b) coincided with the agreement reached at the COP21 in Paris on a new global climate change deal. Although this timing may be merely coincidental, it is a reminder of the close relationship between the use of natural resources and climate change. This relationship becomes evident when looking at the numbers (see Figure 1). An estimated 73 billion tonnes of resources were extracted<sup>1</sup> worldwide in 2010, global

greenhouse gas (GHG) emissions stood at about 50 billion tonnes<sup>2</sup> and roughly 10 billion tonnes of global (industrial and municipal) waste was generated.<sup>3</sup> This means that more than 80% of annual raw material inputs were returned to the environment in the form of emissions and waste (with the rest largely representing additions to stocks, e.g. in the form of buildings and infrastructure). These figures underline the importance of emissions in the physical output of the global economy: GHG emissions accounted for more than 80% by weight of material outflows in 2010, thereby making the atmosphere by far the largest site for the disposal of global waste.

Figure 1. Estimates of material inputs and outputs of the global economy in 2010



Sources: Author’s own calculations based on data from SERI/WU Vienna (2016), IPCC (2014), World Bank (2012) and Frost & Sullivan (2012).

There is a direct physical relationship between the quantity of raw materials used in industrial processes, the energy required and hence GHG emissions. The latter are emitted in all stages of the product lifecycle: extraction, production,

consumption and waste management. The production of raw materials, for example, accounts for roughly 19% of global GHG emissions and the waste sector for another 3%.<sup>4</sup> Reducing global GHG emissions by at least 60%

<sup>1</sup> Including only used materials in four categories: metal ores, industrial and construction minerals, fossil fuels and biomass (from agriculture, forestry and fishery).

<sup>2</sup> IPCC (2014).

<sup>3</sup> World Bank (2012); Frost & Sullivan (2012).

<sup>4</sup> See Enkvist et al. (2015).

by 2050 compared to 2010 in order to limit global warming to “well below 2°C above pre-industrial levels” (as stipulated in Art. 2 of the new Paris Agreement<sup>5</sup>) will thus require more than a shift to low-carbon and renewable energy sources. Improved resource efficiency, greater recycling and re-use, as well as an absolute reduction of raw material use must become key elements of climate policy in the context of a circular economy.

The potential effects of these measures on climate change mitigation are substantial. For example, the Ellen MacArthur Foundation, a charitable organisation established in 2010 with the aim of accelerating the transition to the circular economy, estimates that the transition to a circular economy in three of Europe’s largest and most resource-intensive value chains (mobility, food and the built environment)<sup>6</sup> could decrease CO<sub>2</sub> emissions in the EU by 48% by 2030 and 83% by 2050, compared to 2012 levels.

## 2. Raising the bar for EU circular economy policies

The level of ambition is much lower in the European Commission’s Circular Economy Package, in which full implementation could reduce EU GHG emissions by some 500 million tonnes between 2015 and 2035,<sup>7</sup> equivalent to about 10% of current total EU GHG emissions.<sup>8</sup> In particular, the package contains legislative proposals on waste, which set common EU targets for the recycling rates of municipal and packaging waste (65% and 75% by 2030, respectively) as well as a binding target to reduce landfill to a maximum of 10% of all waste by

2030. Amongst others, the package also includes new proposals on ecodesign, broadening the focus from energy efficiency to other product features including reparability, durability, upgradability, recyclability and the identification of certain materials.

The targets and proposed measures of the Circular Economy Package are likely to reduce both inputs (natural resources) and outputs (emissions and waste) of the EU’s economy. What is missing, however, is an explicit high-level political commitment to an overall reduction of EU resource use within the context of a circular economy. An earlier version of the Circular Economy Package proposed in July 2014 (and later recalled) still included an indicative target to increase resource efficiency, measured as GDP/raw material consumption (RMC) by 30% between the years 2014-2030. This target compares to a business-as-usual projection of a 15% increase over the same period.<sup>9</sup>

Linking the circular economy policy agenda to a headline target of reducing EU resource use would underline the political support for the transition to a circular economy. Possibly, even a non-binding, indicative target could help to increase political attention and visibility of the issue, stimulate long-term ambitions and streamline the actions of all actors – public and private – towards reducing the consumption of natural resources. Similarly, the inclusion of a resource efficiency target in the European Semester process would ensure proper monitoring and sharing of best practise resource efficiency policies.<sup>10</sup>

<sup>5</sup> UNFCCC (2015), Adoption of the Paris Agreement, 12 December (<http://unfccc.int/resource/docs/2015/cop21/eng/109.pdf>).

<sup>6</sup> Including electric, shared, and autonomous vehicles, food waste reduction, regenerative and healthy food chains, passive houses, urban planning, and renewable energy.

<sup>7</sup> European Commission (2015), Circular Economy – Closing the Loop: An Ambitious EU Circular Economy Package, Circular Economy Fact Sheet.

<sup>8</sup> Eurostat (2016), Greenhouse gas emission statistics ([http://ec.europa.eu/eurostat/statistics-explained/index.php/Greenhouse\\_gas\\_emission\\_statistics](http://ec.europa.eu/eurostat/statistics-explained/index.php/Greenhouse_gas_emission_statistics)).

<sup>9</sup> See European Commission (2014). In this Commission Staff Working Document, the calculations are based on a GDP growth forecast of 30% between 2014-30 and an increase in RMC of 14% by 2030.

<sup>10</sup> Ibid.

Some member states have already set similar targets for themselves. For example, in 2002, the German government adopted a National Sustainability Strategy, which includes a target to double resource productivity by 2020 compared to 1994.<sup>11</sup> By 2010, an increase of 47.5% had been achieved.<sup>12</sup> Similarly, France adopted in 2015 a national target to increase by 30% the ratio of GDP to domestic consumption of raw materials by 2030 (compared to 2010).<sup>13</sup>

### 3. Policy Recommendations

Political support for such a target, however, depends on establishing two fundamental preconditions.

First, the paradigm shift towards a circular economy will only gain support if it is linked to an attractive vision for change shared by a majority of stakeholders. Indeed, a circular economy has the potential not only to reduce GHG emissions and other environmental impacts, but also to increase competitiveness of EU businesses and to create jobs. The European Commission, for example, estimates that the Circular Economy Package has the potential to create 580,000 jobs in the EU, 170,000 direct jobs by 2035 through measures on waste management alone.<sup>14</sup> New business opportunities related to recycling, repairing and reusing products have the potential to create jobs on the local level, often at higher qualification levels (vocational level). However, given that other jobs will also be destroyed, the net effect on the EU economy requires closer scrutiny.

But to be successful, this ‘macro-vision’ needs to be underpinned by a strong case for the business sector to ‘turn circular’. In particular small-and-

medium-sized enterprises (SMEs), which constitute 99.8% of all European enterprises<sup>15</sup> and are often considered the backbone of the European economy, need practical, technical, legal and financial support to identify and realise business opportunities associated with the circular economy.<sup>16</sup> After all, 8 out of 10 businesses are satisfied with the return on their resource-efficiency investments, according to a recent Eurobarometer survey.<sup>17</sup>

Second, any (potential) target needs to be measurable by means of robust and harmonised environmental indicators. These indicators thus also play a key role in the transition to a circular economy.<sup>18</sup> They are not just indispensable for the identification of actual trends but also for the effective formulation, assessment, monitoring and evaluation of policies. A lack of data and indicators is often used as a pretext for no action or delayed action on the policy level. Despite the complexity of the issue, a multitude of indicators already exists to measure the transition towards a circular economy (see [www.measuring-progress.eu](http://www.measuring-progress.eu)), although with varying applicability. However, indicators need harmonisation and consistency across the EU – both on the public and on the company level.

### 4. Conclusion

The Paris climate agreement mandates a stronger commitment by the EU to curb its natural-resource consumption in the context of the transition to a circular economy. This commitment should be based on a long-term vision and common indicators in order to ease the introduction of a policy mix aimed at fostering more circular business models. A policy

<sup>11</sup> Resource productivity in this context is defined as GDP generated per tonne of (abiotic) materials used.

<sup>12</sup> See German Government (2012).

<sup>13</sup> See République Française (2015).

<sup>14</sup> European Commission (2015b), Circular Economy – Closing the Loop, An Ambitious EU Circular Economy Package, Circular Economy Fact Sheet.

<sup>15</sup> Eurostat (2016), Business economy – size class analysis ([http://ec.europa.eu/eurostat/statistics-](http://ec.europa.eu/eurostat/statistics-explained/index.php/Business_economy_-_size_class_analysis)

[explained/index.php/Business\\_economy\\_-\\_size\\_class\\_analysis](http://ec.europa.eu/eurostat/statistics-explained/index.php/Business_economy_-_size_class_analysis)).

<sup>16</sup> See also Rizos et al. (2015).

<sup>17</sup> See European Commission (2015c).

<sup>18</sup> See also Behrens et al. (2015).

mix could include voluntary approaches (e.g. voluntary agreements of businesses and industries, information systems, education), economic instruments (e.g. reform of subsidy and tax systems, public procurement) and – where needed – regulation of technology and/or environmental performance of goods and services.<sup>19</sup> Some of these elements are already in the current Circular Economy Package, but reaching the long-term EU GHG emissions targets will require a more comprehensive approach to the full set of resource use policies available. This approach needs to include the setting of a headline resource use target to prove political commitment and streamline action towards a more sustainable use of natural resources in Europe.

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<sup>19</sup> See also Behrens (2004).

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