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POCACITO Policy Brief No. 4 – December 2016

CIRCULAR CITIES

OPPORTUNITIES TO SUPPORT A CIRCULAR ECONOMY IN CITIES

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This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no. 613286.



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LIST OF ABBREVIATIONS

BAU2050	Business-as-usual scenario for 2050
GDP	Gross domestic product
GHG	Greenhouse gas
PC2050	Post-carbon scenario for 2050
SMEs	Small and medium-sized enterprises



SUMMARY

In the POCACITO project, cities around Europe have created a 'post-carbon 2050' vision in which cities have moved towards greater sustainability owing to various environmental measures. However, the results from the project also show that the increase in gross domestic product (GDP) and the rise in consumption that goes with it, along with a reduction in direct emissions at a local level, are in most cases outweighed by a larger, indirect environmental footprint occurring outside the city boundaries.

To address this consumption issue, a transition towards a circular economy is one possibility. A circular economy has the potential not only to reduce the indirect footprint, and thereby total emissions, but also to boost local productivity and create new green jobs.

To support cities in their transition towards a circular economy this policy brief highlights several examples of circular initiatives, including reuse malls, recycling parks, clothing libraries and foodbanks.

A circular economy can sometimes seem hard to achieve but one should not forget the old-fashioned circular business models that already exist, like flea markets, clothing collection services and laundry rooms. With the new technologies of today a circular economy is not far away.

1 ATTENTION! SUSTAINABLE CONSUMPTION NEEDED

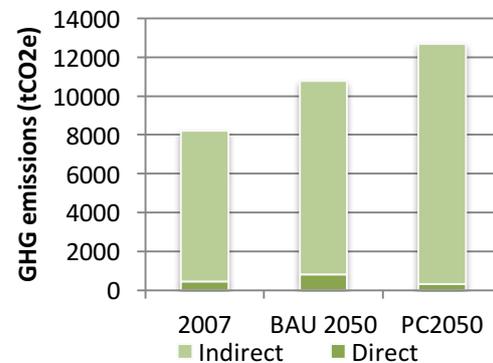
Rapidly growing urban populations and the consequences of climate change place added pressure on the economic, environmental and social health of cities. Local stakeholders are faced with significant challenges and trade-offs when trying to address these concerns. Meanwhile, with the ongoing urbanisation, projections show that two-thirds of the world's population will live in cities by 2050 and in Europe, North America and Latin America the share of the population doing so will be over 80% (United Nations, 2014). With this in mind, it is clear that sustainability will be won or lost in cities.

The importance of making cities sustainable has been considered in the EU-funded project "Post-Carbon Cities of Tomorrow – foresight for sustainable pathways towards liveable, affordable and prospering cities in a world context (POCACITO)", which seeks to facilitate the transition of EU cities to a forecasted sustainable or 'post-carbon' economic model for 2050, by creating an evidence-based, EU roadmap for post-carbon cities.

At the core of POCACITO was a series of participatory workshops in nine case-study cities: Barcelona, Istanbul, Lisbon, Litoměřice, Malmö, Milan, Rostock, Turin and Zagreb. The purpose of these workshops was to bring together local stakeholders to construct a common post-carbon vision for 2050 (PC2050) and roadmap, or action plan, to realise the vision. The scenario was then quantified to determine what impacts it would have and how it would look in comparison with a business-as-usual scenario (BAU2050). The results were shocking: as a result of higher growth in GDP and thereby increased consumption, the PC2050 scenario turned out to have higher emissions than BAU2050 for most cities.

With local city policies focusing on energy efficiency and renewable energy reducing direct, territorial greenhouse gas (GHG) emissions, consumption is often neglected – resulting in a larger, indirect environmental footprint (activities taking place upstream in the supply chain), as shown in Figure 1.

Figure 1: Direct and indirect GHG emissions, the example of Barcelona



Source: Harris et al. (2016a).



Hence, policies developed for cities need to begin to address the growing gap between local emissions and indirect emissions per capita (i.e. address consumption). Otherwise, measures such as renewable energy and energy efficiency will just be window dressing.

In addition to local action, the results from POCACITO also highlight that national policy must support city policies. As the economies of European cities become progressively more based on the service/finance industries, expected to make up 80% or more of GDP by 2050 (Harris et al. 2016b), manufacturing jobs will continue to move abroad. This goes hand in hand with the export of GHG emissions and an expanding, indirect environmental footprint, but also with the export of employment in the manufacturing sector.

1.1 A CIRCULAR ECONOMY

During the POCACITO workshops some cities pointed to the issue of rising consumption. A commonly suggested strategy to reduce the environmental impacts was the implementation of a circular economy approach (Harris et al., 2016b). To support cities in their future work, this policy brief primarily explores how cities can support the transition to a circular economy at a local level.

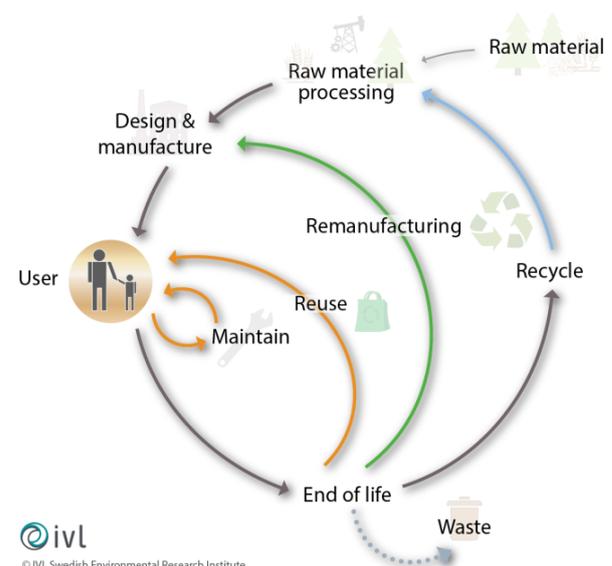
In the EU, cities are beginning to address their local carbon emissions through energy efficiency measures, improvements in waste management and investments in renewable energy. Yet, despite the measures, so far there has been little progress on how to reduce the individual footprint, which to a large degree stems from consumption and the indirect footprint that comes with it. As private consumption drives growth, a reduction of consumption as a way to reduce environmental impacts is often seen as undesirable from an economic perspective. Therefore, increased consumption, often encouraged at the political level, is in contradiction to what is needed, creating a catch-22 situation. The result from the POCACITO project shows that changes in consumption patterns are inescapable in order to reach our environmental targets.

At the workshops of the POCACITO project, a circular economy was often put forward as a solution to the dilemma of rising consumption and highlighted as a means to both reduce environmental impacts and create new green jobs

(Harris et al., 2016b). A circular economy as a means to boost local and regional economies is fully possible. According to the Ellen MacArthur Foundation (2015), economically, implementation could increase Europe's resource productivity by up to 3% annually, which would have positive effects on GDP of as much as 7 percentage points relative to the current development scenario for 2030.

The industrial world has seen a shift of jobs and emissions to the developing world, primarily in the hunt for lower costs (but also in part due to stringent environmental regulation). In the longer term, however, costs for production will also rise outside Europe. Furthermore, European manufacturing has the skills and technology to produce products and components with a lower environmental impact. Together with improved product design, a shift of manufacturing back to Europe could be a key aspect of a future circular economy. As a functioning circular economy requires the ability to undertake repairs and remanufacture on a local scale, it also requires local skills and knowledge.

Figure 2: Pathways in a circular economy



Despite improvements in recycling, Europe still heavily depends on finite resources, which by definition are unsustainable. The linear consumption models of today generate waste, which depletes our resources. In Figure 2, a



circular economy is illustrated and the preferable paths are highlighted: maintain, reuse (including sharing), remanufacture and recycle. The aim is to keep products and materials in the inner circle. As the flow moves inward to remanufacturing, reuse and repair (or maintain), the value of the components is increasingly captured and the resource and energy use are reduced, transforming waste into value. In contrast with today, recycling is not desirable and should be seen as the last solution. The prevailing economy is nonetheless far from circular, and currently only small percentages of the products are actually remanufactured. The development over the last decades has been negative, with less than a percentage of the total product flow being reused or repaired compared with a few decades ago (Parker et al., 2015). The potential for capturing the value of the enormous flow of resources entering cities every year is therefore huge.

On the different paths in Figure 2 different, various business models can be found or developed. Frequently, the inner circle for which a product is best suited is decided in the design phase of the product. In fact, up to 80% of the environmental footprint of a product is already set before the product is produced (RISE, 2014).

1.1.1 Refurbishment and remanufacturing

Refurbishment and remanufacturing are important parts of a circular economy. In these processes, used products or product parts are restored to like-new condition and can replace new parts or products. Remanufacturing is common today for some parts in the automotive industry. There are two approaches to how this could be handled in a future circular economy:

- 1) send products back to where they were manufactured, mainly in foreign countries; and
- 2) encourage and support more local activities that undertake refurbishment and remanufacturing (and which also increase local manufacturing, itself more economically beneficial in this scenario).

The major challenge of (1) is getting the products back in one piece, but there is also the impact of transport, which needs to be taken into account. But with the efficient transport flows of today it

could be done in a way that is environmentally friendly. For the other approach (2), the business potential for new local SMEs that undertake remanufacturing and refurbishment is high, although the businesses will probably need some kind of support initially.

1.1.2 Sharing

In a circular economy, an important aspect is to look at the underlying need. When a consumer purchases a product, it is often done to fulfil a need that sometimes can be satisfied just as well by a service. One example is the purchase of a new car when the transportation need could be fulfilled just as well by joining a car pool. Hence, it is important to remember that the circular economy not only circulates materials, but also circulates value and ultimately jobs and well-being. The purpose of a circular economy is thus not just to close the material flow, but at the same time to reduce it. A way of doing this is by sharing products and the concept of a sharing economy is often seen as an important part of in a circular economy. The sharing economy enables a more efficient use of products and can preferably be used within circular business models. An example is car sharing. A typical European car is parked and not used 92% of the time (Ellen MacArthur Foundation, 2015). This leaves room for a significant efficiency increase if more people could use the same car. Furthermore, the use of products in a sharing economy is a very efficient and direct type of reuse. In addition to the contributions to reduce the environmental footprint, the sharing economy could be beneficial from the social perspective of sustainability, as it enables access to goods by citizens who cannot afford to buy them.

1.1.3 Technological development

Technological developments during the last decades have produced new tools and platforms that can support a circular economy. Tools such as 'the internet of things' (a networked connection of physical objects), product hacking and social media together are changing the face of society, innovation and modern business. Recently, the development of different smartphone apps that enable people to share and sell production in an easy way have gained attention. Apps have also



enabled new information platforms through which cities can spread information to their residents.

2 EXAMPLES OF CIRCULAR ECONOMY INITIATIVES

The concept of a circular economy is broad and can be applied in numerous ways and business models. In most European cities, a number of circular economy initiatives already exist. The POCACITO cities are no exception, and the several examples of circular business models found were used as both a means to reduce waste and to create new green jobs, taking back aspects of production from foreign countries. Below are a number of examples of circular business initiatives, from cities in the POCACITO project (Malmö and Copenhagen) as well as other European cities.

Toolpool

There is a hardware store in the city centre of Malmö where people can borrow tools for free. This reduces the need for consumers to purchase their own tools, yet the business owner has still increased his revenue by 25% as a result of higher sales of nails, bolts, tape, etc.

SwopShop

Clothes swapping has been made into a business. If someone has purchased clothing that did not have the perfect fit or did not come to use, SwopShop offers to hand it in and in return the individual gets credit that can be used to purchase new clothing in the shop. The shop is located in Malmö.¹

Rumba

A company based in Malmö rents out meeting rooms in vacant venues, offices or shops. The business model enables the use of vacant premises while the property owner is looking for new long-term tenants or businesses.²

¹ See <http://www.swopshop.se/>.

² For more, see www.rumba.nu.

Streetbank

Through this initiative, neighbours give away or share things with each other through a webpage. One can also offer training or help with language or gardening, for instance. Streetbank is not limited to a certain area but open for all neighbourhoods to use.³

ResQ club

ResQ club is an organisation that connects restaurants which have leftovers with customers via a smartphone application. The meals are sold at a discount and meals that otherwise would have been thrown away are eaten. ResQ club so far mainly serves businesses in Sweden and Finland.⁴

Foodbanks

Foodbanks are charity organisations that distribute food to economically or socially vulnerable persons. Most of the time food that is approaching its expiration date or for other reasons cannot be sold is donated to the organisations from grocery stores or restaurants. Among the examples are Foedevarebanken in Copenhagen and Matsentralen in Oslo.⁵

ReTuna – Reuse mall

ReTuna is one of the first shopping malls that accepts things that are no longer used, broken or are discarded for other reasons. Through renovation, repair and creative reuse, old things are made attractive again and resold. In the ReTuna shopping mall there are 14 stores and a restaurant. The vision is that people come to the shopping mall to leave their unwanted things, then continue with an eco-friendly lunch in the restaurant before taking a tour of the shopping mall. The mall is located in Eskilstuna, Sweden, and owned by the municipality.⁶

³ See <https://www.streetbank.com/>.

⁴ See <https://resq-club.com/en/>.

⁵ See <http://matsentralen.no/>; see also <http://www.foedevarebanken.dk/>.

⁶ See <http://www.retuna.se/>.



Box 1: Old-fashioned circular business initiatives

With the technological development of the internet, smartphones and other technical devices, many new possibilities to share products have emerged. The positive aspects of this trend should not be neglected. Still, if we look around society, there are already several well-established models that people take for granted.

A common sharing model is the shared laundry room in many apartment buildings, and sometimes the buildings also have a shared guestroom that can be booked by the tenants. Another example is car sharing, which has existed for a long time, often within housing associations. Although the concept is becoming more common, the concept as such is nothing new. Related to transport, it is also interesting to see how such companies as Uber have made the very old concept of car sharing seem like something new and popular. What other old concepts in the transport sector could be renewed in a similar way?

In many European cities clothing collection is common, often undertaken by charity organisations. The collected clothes are later resold in second-hand shops, creating a perfect circular business model. Many second-hand stores also collect and sell things other than clothing. In addition, flea markets represent a platform for circular business that has been around for a long time. As in the case of second-hand shops, things find new owners and are put into use again.

Recycling park – Alelyckan

At the recycling park Alelyckan, just outside Gothenburg, people are welcome to discard rubbish and worn-out stuff for recycling. To ensure that reusable goods are not thrown away, all visitors first have to show their discarded items to the staff, who sort out those things that are still in good shape and possible to sell and reuse. All items that can be resold are transported to stores located in the recycling park.

Clothing library

One example of a circular business model for fashion is clothing libraries, which work along similar lines as a common book libraries but offer fashion instead of books. There are several types of clothing libraries, including clothing brands that only rent out their own brand and independent clothing libraries that purchase clothing from several brands. Clothing libraries have already opened up in several different cities, including Malmö, Gothenburg and Barcelona.

Efficient collection

An alternative to people leaving their things at a recycling station is to have a collection car going around the city picking up those items that can be reused. In this way, items can be collected more efficiently and emissions from transport by separate donors can be avoided. Examples can be found in Gothenburg.

3 THE ROLE OF THE CITY

Current circular business models are primarily developed as private initiatives. The POCACITO project shows that sustainable consumption often falls off the radar for many cities (Harris et al., 2016a). Yet for a city to increase the momentum in moving towards a circular economy, there are several direct actions that can be taken.

Above all, new business models need customers in order to survive. As the municipality itself is one of the main consumers in a city, the municipality could make a direct difference by **enabling its own companies and administration to use circular business services**. Through this action, the municipality could lead the way for others and reduce the perceived uncertainty of many consumers about new business models. In addition, the municipality would also reduce its own indirect environmental footprint. Furthermore, the cities could support local enterprises by **providing business support and strategic advice to entrepreneurs** thinking of starting a business based on circularity. This could potentially ease the implementation of circular business models and function as a platform for spreading knowledge and experience from other enterprises in the city.

To enable a higher degree of reuse in a city, many municipalities have the possibility to work on two



levels. To begin with, they can work through their ordinary activities, for instance presenting an alternative to ordinary waste management by providing collection facilities for used products. Many cities also own and manage large real-estate holdings over which they have influence. An example action would be to provide rooms in apartment blocks where the tenants could leave unwanted items and let someone else pick them up. **There are several municipalities that have already been successful in some measures, such as Alelyckan and ReTuna described above.** In the case of ReTuna, the business not only enables reuse but also undertakes repairs and remanufacturing.

Cities could encourage sharing services in several ways, both in general and in connection with their property holdings, for example by enabling parking lots for car sharing.

4 CONCLUDING REMARKS

In the necessary transition to a sustainable or 'post-carbon' society, the circular economy will play a central role, as **it inherently reduces the total environmental impacts of cities while also promoting innovation, equality and social cohesion (through the sharing of products), and fosters local businesses – resulting in increased employment and economic development.**

Moreover, it should be recalled that **circular business models are not rocket science. Even though a complete transition to a circular economy will take time, there are plenty of areas where we can start. With enough creativity the possibilities seem endless.**

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PROJECT

This policy brief was written as part of the POCACITO project (Post-Carbon Cities of Tomorrow – foresight for sustainable pathways towards liveable, affordable and prospering cities in a world context), coordinated by the Ecologic Institute.

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