WaysTUP!

VALUE CHAINS FOR DISRUPTIVE TRANSFORMATION OF URBAN BIOWASTE INTO BIOBASED PRODUCTS IN THE CITY CONTEXT

# PROJECT NEWSLETTER

## ISSUE 1

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*If everyone on the planet consumed like the average European, we would need almost three Earths to sustain the global economy.*

SOURCE: Pantzar, M. and Suljada, T. (2020) Delivering a circular economy within the planet's boundaries: An analysis of the new EU Circular Economy Action Plan. Institute for European Environmental Policy (IEEP) and Stockholm Environment Institute (SEI): Brussels and Stockholm.

## Welcome to the first WaysTUP! newsletter

We are delighted to welcome you in our very first WaysTUP! project newsletter.

Take a minute to explore the project and better understand it through the interview of Ricardo Martínez Fuentes, CEO of SAV, the project's Coordinating partner. Discover successful stories of biowaste-biobased products and recent Circular Economy policy development.

Become familiar with our recently launched WAYSTUP! project website and follow us on social media to stay updated about news

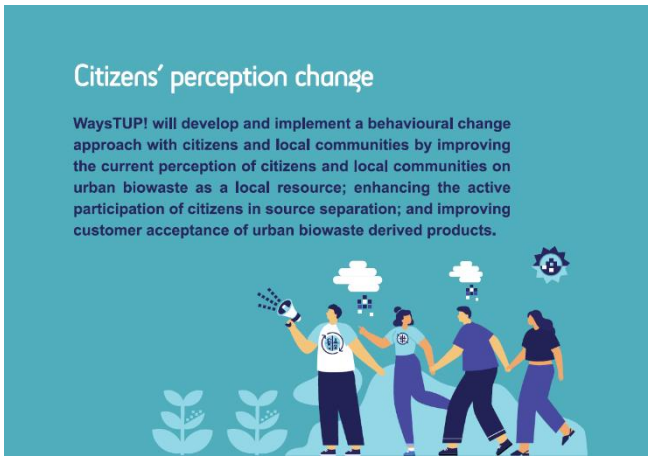

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 818308.

# WaysTUP! in brief

Turning urban biowaste into a resource is major key to a circular economy. WaysTUP! aims to demonstrate the establishment of new value chains for urban biowaste utilisation through a multi-stakeholder approach in line with circular economy.

WaysTUP! is designed to showcase a portfolio of new "*urban biowaste to biobased products*" processes starting from different feedstocks i.e. fish and meat waste, spent coffee grounds, household source separated biowaste, used cooking oils, etc. The processes will result in the production of food and feed additives, flavours, insect protein, coffee oil, bioethanol, biosolvents, bioplastics etc. End-product characterisation and safety assessment will be implemented as well as Life Cycle Assessment of the value chains to assess their environmental impact.

Moreover WaysTUP! will develop and implement a behavioural change approach with citizens and local communities by improving the current perception of citizens and local communities on urban biowaste as a local resource, enhancing the active participation of citizens in the separate collection of urban biowaste and improving customer acceptance of urban bio-waste derived products. New profitable business models will be developed preparing market entry of the technology solutions demonstrated, as well as of the end-products resulting from them. The project will also provide guidance to city managers on adopting new organizational models supporting the valorisation of urban biowaste, as well as evidence-based EU level policy recommendations for decision makers. Pilot demonstration will take place in Valencia, London, Alicante, Prague, Athens, L'Alcúdia, Terni and Chania.

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# WaysTUP! project progress

The identification of opportunities and barriers to utilisation of urban biowaste sources started in the beginning of the project and has already made valuable progress. A laboratory analysis protocol has been successfully developed and a methodology for executing waste analysis campaigns in the pilots of the project. Moreover, in this work package, the activities related to the development of a catalogue of urban biowaste valorisation solutions and good practices examples were initiated, as well as the conceptual framework for cataloguing the main barriers related to urban biowaste valorisation for biobased products was set.

Regarding the preparation of the pilots, the partners are currently setting the type and logistics for the feedstock they will use in pilot operation. For example, the deliveries of food waste from schools and hotels to be transformed into bioethanol were established. Cellulosic waste was received, and the pre-treatment of these waste resources is underway. Other partners are preparing construction works needed for their pilots. Moreover, the first small scale tests have been performed such as extracted coffee oil from spent coffee grounds from cafes, and the first samples of used cooking oil have been processed.

The objective with respect to the setting the scope of the behavioural change campaignwas to define the scope of the behavioural change intervention aiming to improve citizen's and communities' participation in sorting biowaste as well as improving their acceptance of bio-based products. In doing so, the behavioural change study contributed to a sustainable economic system whereby the aim is to reduce the consumption footprint and increase the circular material use rate.

The work in regard of the evaluation of the pilots will begin once all pilots will be developed and tested. Based on data provided by all the developed processes, this work package aims to evaluate the technical achievements and practical limitations, characterize the end products including their safety assessment, evaluate the environmental and economic performance of the developed process and explore the regulatory aspects related to new value chains from urban biowaste.

The objective of the work package on new business concepts along the urban biowaste value chains is to assess the market readiness, define and setup business models and marketing concepts and prepare market entry of the technology solutions. So far, the relevant project team is working on the analysis of the markets where WaysTUP! pilots are expected to be active in, examining among other things the market drivers and barriers to entry as well as the potential markets for deployment beyond the pilot stage. Furthermore, the team is looking at the development of new innovative business models relevant to the concept of circular economy. The strategy for Intellectual Property Rights stemming from the Project has been setup.

The objective of the work package on policy implications and recommendations is to assess policy implications and recommendations for city managers adopting new models supporting the recycling and revalorization of urban biowaste. The policy framework to provide evidence-based recommendations at the EU level will be examined and a series of guidelines and directions on how local decision makers can best implement the WaysTUP! model will be produced.

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# The Circular Economy Action Plan

In December 2015, the European Commission adopted the Circular Economy Action Plan, which was an important step towards closing the carbon loop in Europe and making sure resources are not wasted but re-enter the economy by design or intention.

A few weeks ago, the European Commission adopted a new Circular Economy Action Plan that sets out 54 ways to "*close the loop*" of product lifecycles while it puts a major emphasis on finding new, innovative means to move away from a 'take-make-dispose' culture. This approach helps to drive forward not just environmental, but also economic progress.

A circular economy can offer major benefits:

- 450 million fewer tonnes of EU carbon emissions by 2030
- Savings of €600 billion for EU businesses (8% of their annual turnover)
- 580,000 new jobs

The Action Plan is accompanied by over €10 billion in funding, confirmed by the Commission for 2016-2020.

The new Action Plan announces initiatives along the entire life cycle of products, targeting for example their design, promoting circular economy processes, fostering sustainable consumption, and aiming to ensure that the resources used are kept in the EU economy for as long as possible. It introduces legislative and non-legislative measures targeting areas where action at the EU level brings real added value.

It presents measures to:

- ✓ Make sustainable products the norm in the EU;
- ✓ Empower consumers and public buyers;
- ✓ Focus on the sectors that use most resources and where the potential for circularity is high;
- ✓ Ensure less waste;
- ✓ Make circularity work for people, regions and cities,
- ✓ Lead global efforts on circular economy.

## Simply said about the New Circular Economy Action Plan

*What is the new EU Circular Economy Action Plan?*

The new Action Plan announces initiatives for the entire life cycle of products, from design and manufacturing to consumption, repair, reuse, recycling, and bringing resources back into the economy. It introduces legislative and non-legislative measures and targets areas where action at the EU level brings added value.

*What measures are foreseen on waste?*

Preventing waste from being created in the first place is key. Once waste has been created, it needs to be transformed into high-quality resources. The Commission will put forward waste reduction targets for more complex streams, and enhance the implementation of the recently adopted requirements for Extended Producer Responsibility schemes, amongst other actions. The Commission will continue modernising EU waste laws. Rules on waste shipments facilitating recycling or re-use within the EU will be reviewed. This will also aim to restrict exports of waste that cause negative environmental and health impacts in third countries by focusing on countries of destination, problematic waste streams and operations. The Commission will also consider how to help citizens to sort their waste though an EU-wide harmonised model for separate collection of waste and labelling.

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# Success Stories

## Jelšovce Distillery in Slovakia

More or less 10 percent of the raw material entering a distillery turns into a liqueur or brandy. The majority of what is left is waste signifying substantial disposal issues. Functional and well-thought waste management system is key for efficient recycling and reuse of nutrients and resources.

The distillery in Jelšovce, Slovakia established a unique system leading to almost a zero-waste production. It is equipped with state-of-the-art technology, based on a modern method of distillation management using the latest knowledge in the burning process. Already the first step works as a waste prevention measure, since all fruits are manually picked up from trees and shrubs. The main process takes place in a single-boiler device with a rectification multi-storey column. The first distillate containing methanol is toxic. It is used by a local producer of paints. The fruit ferment is used by local farmers as an effective fertilizer with no odour in comparison with liquid manure. It is available free of charge. For instance, the apricot seeds are taken gratis by a Swiss pharmaceutical company for further production. The fruit kernels are available free of charge for heating purposes as it was discovered that their caloric value is even higher than in wood. This way, the environmental impacts of the distillery are minimized. Furthermore, valuable nutrients are returned back to nature and side-products are reused elsewhere following the principles of industrial symbiosis.

The distillery is well-known for the modern method of distillation management meeting the strictest EU rules and using the latest knowledge in the burning process. Local community likes to use the valuable side-streams (e.g. ferment or kernels) free of charge. In Slovak conditions, this case of industrial symbiosis, although small-scaled, is unique.

SOURCE: Interreg Europe project BIOREGIO

## Fazer Mills in Finland

*Utilising the side stream of an oat milling process with state-of-the-art technology for xylitol production is a great example of a modern circular economy innovation.*

Xylitol is a sweetener produced from xylose, which is found in various trees and plants, e.g. birch, beech, corn and berries. The most popular xylitol products are chewing gum and pastilles.

Fazer is the only company producing chewing gum in Finland. In Fazer's oat milling process, a substantial amount of oat hulls is derived as a side stream. Oat hulls are used mainly for energy production, but they contain xylose which can be used to produce xylitol. As the xylitol market is growing, Fazer aims to be the only xylitol manufacturer producing xylitol from a plant-based raw material.

Construction work for the new manufacturing facility started in February 2019 and Fazer Xylitol will be commercially available at the beginning of 2021.

SOURCE: Fazer Mills

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# An insider's view Interview with Ricardo Martínez Fuentes, CEO SAV

**The WaysTUP project aims to develop bio-based products from biowaste materials. Can you give us some examples?**

Nowadays a transition to a bio-economy is imperative and an economy based on a linear model is no longer a valid option. WaysTUP! aims to use biological resources from farming, sewage and organic waste to make new sustainable and value products. Therefore, WaysTUP! is a project-based into bio-economy inside a framework of circular economy.

As a model of examples, we are going to use by-products from fisheries (managed by small producers) or leftovers of meat from municipal markets to produce new valuable by-products such as jellies and feed. Another interesting example will be to use biochar from water treatment processes as fertilizer in local orchards of small farmers in Valencia (Spain), in order to retain soil structure and moisture during dry times while holding nutrients during wet periods. As it can be seen, one of the main objectives of WaysTUP! is to support local jobs & local business.

**Why is this type of action important at this point of time?**

The world is actually witnessing the vulnerability of the current production and consumption systems. WaysTUP! is going to demonstrate that besides transforming waste & by-products into high-quality raw materials, in order to reduce the impact on the environment, a big contribution towards a more European competitive economy can be also delivered.

**If you had to predict the best and the worst scenario for the future of our environment, what would it be? How can we secure the one and not the other?**

We are actually running a linear economic model "make-use and dispose". Instead to destinate resources for reducing the negative impacts of this model, we must adopt a circular model that will provide environmental and societal benefits while providing, at the same time, new business and economic opportunities.

[from left to right]
Belén Miranda, Ricardo Martínez Fuentes, Jeroni Franco

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# On our radar

Carbo Culture https://www.carboculture.com/ is a carbon tech company founded in Finland and headquartered in San Francisco. Since 2018, Carbo Culture has raised €550K in pre-seed investment. The company believes that profitable carbon sequestration is possible by turning biomass waste into biochar to repair the soil.

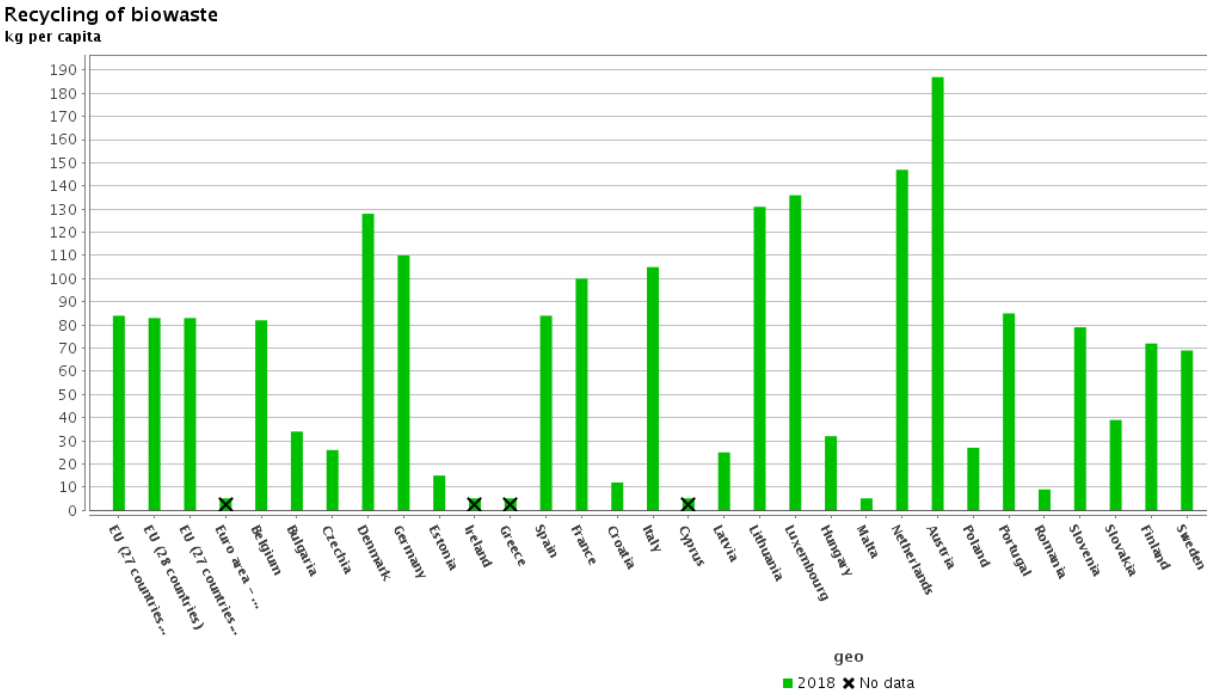
Carbo Culture has a demo scale facility with a 500 lbs/h capacity in the Central Valley of California that processes multiple types of forestry waste, dry plant matter waste (woody plants, nutshells, etc.) into high-quality carbon.

> Biochar is a relatively new term that essentially describes biomass charcoal when used or found in soil (Josiah Hunt, CEO of Pacific Biochar).

Pacific Biochar https://pacificbiochar.com/ started operation six years ago, and is funded by revenues and a small amount of seed funding. The company makes five different biochar products for farmers.

> A 2015 study from the University of Washington reported that the use of biochar in the soil had increased soil carbon levels between 32-33%.
>
> Biochar works like a coral reef in the ocean - it fosters soil life in its surface, and enables the soil to use nutrients better and be healthier. It's a way of boosting resilience in the face of changing weather and grows long-term yields (Henrietta Kekäläinen, CEO, Carbo Culture).
>
> Biochar is listed as one of the top five natural climate solutions for climate change mitigation in a 2019 Intergovernmental Panel on Climate Change (IPCC) Climate Change and Land report.

# EUROSTAT statistics

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# OECD Policy Dialogues and relevant good practices

Valladolid Spain

The City of Valladolid, Spain is committed to promote a transition to the circular economy. A total of 67 projects related to the circular economy have been benefitting from municipal grants since 2017. Projects are promoted by the private sector, nonprofit organisations and research centres with headquarters in the municipality. It is expected that a circular economy approach can bring new socio-economic opportunities to the city, especially by enhancing innovation in business. Valladolid was one of the first signatories of the Declaration of Seville (2017 commitment on the circular economy of Spanish municipalities).

Umeå Sweden

The Strategic Plan of Umeå, Sweden for the period 2016-2028 states that the city should become a circular economy leader. This vision provides a good momentum to discuss future circular economy related plans, since population growth will have consequences on housing, use of natural resources and space. In 2019, a national delegation for the circular economy has been established to strengthen society's transition to a resource-efficient, circular and bio-based economy both nationally and regionally. Building knowledge and collaborations across government, business and universities are the greatest priorities for the transition to circular business models.

Groningen, The Netherlands

The City of Groningen is the 5th most populated city in the Netherlands. The Municipal Council unanimously decided to make the circular economy a priority for the city. A vice mayor with specific responsibilities on the topic took office in March 2018. Groningen is developing a circular economy strategy focusing on waste, public procurement and knowledge building.

According to the European Commission: "Bio-waste is defined as biodegradable garden and park waste, food and kitchen waste from households, restaurants, caterers and retail premises, and comparable waste from food processing plants. It does not include forestry or agricultural residues, manure, sewage sludge, or other biodegradable waste such as natural textiles, paper or processed wood. It also excludes those by-products of food production that never become waste."

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# Forthcoming Events


## 10th World Convention on Recycling and Waste Management

The "*10th World Convention on Recycling and Waste Management*" slated on July 20-21, 2020 @ Osaka, Japan will cover on all aspects of the Recycling and Waste Management, with strong emphasis on originality and scientific quality. This Waste Recycling Congress 2020 is setting a platform for all the budding Scientists and Researchers to present their real-time work and share their views and aspects related to the theme of the Conference. Waste Recycling Congress 2020 is based on the theme "Recycle for a Greener Planet". This gathering will cover the innovative methods, the most recent techniques and new research systems, developments, and the newest updates in Recycling and Waste Management (link).

## Circular Materials Conference

The Competence Centre of Recycling (CCR) at Chalmers University of Technology in cooperation with Nordic Publishing in conjunction with major organisations from the basic, chemical, recycling and textile and fashion industries organize the fifth "Circular Materials Conference" on September 22-23 2020 at Chalmers Conference Centre in Gothenburg, Sweden. Focusing on Industrial, scientific and commercial advances in circular materials, the event will feature keynote speeches, seminars, site visits and solutions exhibition, as well as welcome conversations, debate, face-to-face meetings and networking (link).

## European Resources Forum (virtual ERF 2020)

The 5th European Resources Forum will be held on November 3, 2020 as a virtual conference. The ERF has been established as a European platform for discussion on the issue of sustainable resource use by focusing on the political and scientific debate on this subject. The conference addresses European decision makers and experts from the fields of policy development, industry, academia, civil society and the media. 300 participants from over 40 nations are expected. The European Resources Forum contributes to the development and implementation of common positions for policy-making in Europe and internationally.

## 17th World Congress and Expo on Recycling

Recycling congress 2020 invites all participants to the "17th World Congress and Expo on Recycling" which is going to be held during November 9-10, 2020 at Amsterdam. It mainly focuses on two key topics viz. Recycling and Waste Management with basic theme "Recycling: Creating a Sustainable World". Recycling Congress 2020 provides an exceptional platform to the academic and non-academicians across the globe and creates awareness on how to maintain an Eco-friendly environment (link).

# Project Partners

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