PRESS RELEASE

Lyon, 5 july, 2022

WhiteCycle: A European consortium to recycle plastic waste

• An innovative European project to process and recycle plastic textile waste
• A partnership to reach the objectives set by the European Union in reducing CO2 emissions by 2030
• A unique consortium rallying 16 public and private European organizations working together for more circular economy

The WhiteCycle project, coordinated by Michelin, was launched on Friday, July 1st. Its main goal is to develop a circular solution to convert complex waste containing textile made of plastic into products with high added value. Co-funded by Horizon Europe, the European Union's research and innovation program, this unprecedented public/private European partnership includes 16 organizations and will run for four years.

WhiteCycle envisions that by 2030 the uptake and deployment of its circular solution will lead to the annual recycling of more than 2 million tons of the third most widely used plastic in the world, PET . This project should prevent landfilling or incineration of more than 1.8 million tons of that plastic each year. Also, it should enable reduction of CO2 emissions by around 2 million tons.

Complex waste containing textile (PET) from end-of-life tyres, hoses and multilayer clothes are currently difficult to recycle, but could soon become recyclable thanks to the project outcomes. Raw material from PET plastic waste could go back into creation of high-performance products, through a circular and viable value chain.

16 public and private European organizations are combining their scientific and industrial expertises:
• 3 industrial partners (Michelin, Mandals, KORDSA);
• 1 cross-sector partnership (Inditex)
• 2 waste management companies (Synergies TLC, ESTATO);
• 1 intelligent monitoring systems for sorting (IRIS);
• 1 biological recycling SME (Carbios);
• 1 product life cycle analysis company (IPOINT);
• 1 university, expert in FAIR data management (HVL);
• 4 universities, research and technology organizations (PPRIME – Université de Poitiers/CNRS, DITF, IFTH, ERASME);
• 1 industry cluster (Axelera);
• 1 project management consulting company (Dynergie).

White Cycle project has received funding from the European Union's Horizon 2020 research and innovation program under Grant agreement no.101036908.

The consortium will develop new processes required throughout the industrial value chain:
• Innovative sorting technologies, to enable significant increase of the PET plastic content of complex waste streams in order to better process them;
• A pre-treatment for recuperated PET plastic content, followed by a breakthrough recycling enzyme-based process to decompose it into pure monomers in a sustainable way;
• Repolymerization of the recycled monomers into like new plastic;
• Fabrication and quality verification of the new products made of recycled plastic materials

WhiteCycle has a global budget of nearly 9.6 million euros and receives European funding in the amount of nearly 7.1 million euros. The consortium's partners are based in five countries (France, Spain, Germany, Norway and Turkey). Coordinated by Michelin, it has an effective governance system involving a steering committee, an advisory board and a technical support committee.

Funded by the European Union. Views and opinions expressed are however those of the authors only and do not necessarily reflect those of the European Union or the European Research Executive Agency. Neither the European Union nor the granting authority can be held responsible for them.

About Axelera
Axelera is a French cluster at the crossroads of the chemical and environmental sectors. One of Axelera's missions is to help mature waste management and recycling projects with its members and their processes as part of its more global commitment to developing sustainable, efficient, circular and clean solutions for industry. Axelera's public-private network of 400 members gathers expertise in: Materials, chemicals, equipment and system manufacturing and integration; Process engineering, industrial energy and resource efficiency, and regulatory compliance; Circular economy; Water, air, and soil depollution; Renewable raw materials; Digitalization of the process industries. (www.axelera.org)

About Carbios
Carbios, a green chemistry company, develops biological and innovative processes representing a major innovation in the end of life of plastics and textiles. Through its unique approach of combining enzymes and plastics, Carbios aims to address new consumer expectations and the challenges of a broader ecological transition by taking up a major challenge of our time: plastic and textile pollution. Established in 2011 by Truffle Capital, the mission of Carbios is to provide an industrial solution to the recycling of PET plastics and textiles. The enzymatic recycling technology developed by Carbios deconstructs any type of PET plastic waste into its basic components which can then be reused to produce new PET plastics of a quality equivalent to virgin ones. (https://www.carbios.com/en/)

About DITF
The German Institutes of Textile and Fiber Research Denkendorf are a research institution supported by the state Baden-Wuerttemberg and a member of the Innovation Alliance Baden-Württemberg (innBW). With more than 250 employees on an area of more than 25,000 m², they conduct nationally and internationally networked application-oriented research across the entire textile value chain. The DITF works on cross-thematic research and development projects for diverse applications such as mobility, architecture and construction, health and care, environment and energy, and apparel. (www.ditf.de)

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About Dynergie
Dynergie is a French consulting company bringing together complementary activities and distinctive know-how to offer 360-degree services and to ensure innovation success to its clients. The team is composed of 80 people gathering 40 multisectorial engineers. The 'Innovation projects and partnerships' division helps major companies, SMEs, and research organisations set up and manage innovation projects as well as find partnerships. Its team of experts has extensive combined expertise and more than 10 years of experience in the field of collaborative European funding. Dynergie supports national funding (FUI, AMI-ADEME, ANR, "Investing in the Future" programmes, etc.), European funding (Eurostars, H2020, InnoEnergy, Horizon Europe, IPCEI etc.), and even bilateral funding. Dynergie manages to obtain more than 32 Million Euros of public grants in the last 3 years for its clients. Since 2017, Dynergie has successfully assisted more than 60 national and European projects, with nearly 80% of positive replies from the financing authorities.

About ERASME
ERASME is an EU Jean Monnet Excellence Centre on Sustainability established in 2019. It is a platform that aims to research, educate, and spur action for a sustainable world guided by systems thinking and to open up for creative dialogues on alternative futures. The Centre's focus lies on systems thinking approaches and system dynamics modelling for sustainable development covering a broad range of topics in the social, economic and environmental domains of sustainability (e.g. energy systems, industrial manufacturing, agricultural systems, natural resources, socioeconomic systems, circular economy, sustainable cities, etc). The methodological approach is integrative and inter- and transdisciplinary. The overall vision is to facilitate sustainable system development within and beyond Europe through research, educational and networking activities.

About ESTATO
Already since 1994 ESTATO Umweltservice GmbH covers the complete workshop disposal of different branch networks in the German and Austrian automotive sector and also takes care of all environmental and energy consulting issues. All recyclable materials such as used tyres, car batteries, scrap metals, oil filters, operating fluids, or packaging materials are collected in a closed reverse logistics system and professionally processed and disposed of in one of the two operated big recycling centres or more than 500 collection points. This logistical masterstroke laid the foundation for a successful concept for recyclables processing and waste disposal. ESTATO Umweltservice GmbH, as a certified waste and energy management company, is a industrial partner for numerous regional, national and international customers. One of the main pillars of the business model is the mechanical recycling of used tyres. In addition to highly efficient processes, the use of state-of-the-art plant technology and its constant further development as well as the involvement of more than 100 trained and experienced waste management professionals is also an important component of the sustainable corporate strategy. With a current processing capacity of around 10 million tyres per year, ESTATO Umweltservice GmbH already operates one of the largest tyre recycling plants in Europe and has thus become one of the leading suppliers of high-quality rubber granulates. (www.estato-umweltservice.de)

About Western Norway University of Applied Sciences (HVL)
HVL is one of the largest educational institutions in Norway and currently hosts about 17,000 students and 1800 staff members. It offers a broad range of study programmes within social sciences, health, engineering, teacher education, maritime sciences, natural sciences, culture and sports, economics and management. Research at HVL is centered on responsible innovation, sustainable energy and environment, ocean, public health, data technology and creative learning. HVL hosts multiple regional, national and international research projects including several EU-funded projects related to energy, sustainability and FAIR data management. (www.hvl.no/en/).

About Inditex
Inditex is one of the world's largest fashion retailers, with seven brands (Zara, Pull&Bear, Massimo Dutti, Bershka, Stradivarius, Oysho and Zara Home) operating in more than 200 markets through its online platform and stores. With a business model focused on meeting customer desires in a sustainable way, Inditex is committed to achieving climate neutrality by 2040.

About IFTH
IFTH is the French technological reference center for the fashion, textile and clothing sectors.
The IFTH role is dual : to provide technical, technological and specific solutions to business needs, and to feed the textile and clothing ecosystem in order to promote growth, sustainable development and relocation of activities in the territory.

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IFTH brings expertise in research and innovation through many funded collaborative R&D projects, in tests and certification of textile products and in training:

- Research and Innovation, involving products (functional textiles, composites and clothing) and processes of the whole value chain of the textile and clothing Industry
- Testing, standardization, and certification (offering over 500 textile standards and tests). Examples are microbiological tests, fire tests, comfort tests, UV tests, ageing test, OEKO-TEX®
- General and specific training for the preservation of the know-how and the development of skills

To facilitate the transfer to Industry, IFTH has several semi-industrial engineering platforms to elaborate and validate some concepts, for pilot trials and prototyping
Moreover, IFTH integrates The national Sectoral Standardization Office (BNITH).
(IFTH: Institut Français du Textile et de l'Habillement / French institute for textile and clothing - www.ifth.org)

About iPoint
iPoint empowers companies to collect and analyze all necessary data to assess and report the environmental, social, and economic impacts of their products and related processes. Since 2001, SMEs and Fortune Global 500 companies alike have been using their software to manage compliance, risk, and sustainability by digitalizing the lifecycles of products and supply chain relationships.
With their consulting and software solutions, iPoint is also a leading global company for material flow analyses, life cycle assessments, and material flow cost accounting. iPoint offers solutions for sustainable products that enable companies to reduce the CO2 footprint, to reduce environmental impacts along the entire product life cycle, and to combine environmental and efficiency perspectives through comprehensive cost accounting. The company is active in the development of international standards like the ISO 14 000 series. Ongoing standardization projects concern, e.g., climate neutrality, carbon footprints of transport operations, as well as the ISO TC 323 series of standards for Circular Economy. Further information: www.ipoint-systems.com

About IRIS
IRIS is a Spanish Deep-Tech company specialized in Real-Time Monitoring solutions based on Photonics-based Process Analytical Technology (PAT) systems and Industrial Artificial Intelligence (eg Machine Learning and Deep Learning) for data-driven process efficiencies and quality standardization in the Food, Chemical, Pharmaceutical, Bio-based and other process industries. We also develop AI-enabled Cloud Platforms for digitizing value chains. Our company has two divisions: IRIS Commercial that delivers B2B solutions and services to industry; and, IRIS Innovation Lab that works in an Open Innovation context to build new knowledge, knowhow and IP to fuel our innovation pipeline so that we can offer cutting edge solutions to industry via our Commercial Division. (www.iris-eng.com)

About KORDSA
Kordsa, advance material company and global player of tire and construction reinforcement and composites markets, operates in 12 facilities throughout 5 countries including Turkey, Brazil, Indonesia, Thailand and USA with its over 4.500 employees. Kordsa develops reinforcement technologies for the tires of vehicles from different segments, such as automobiles, airplanes, and agricultural/industrial vehicles. Today, Kordsa reinforces 1 out of every 3 automobile tires, and 2 out of every 3 airplane tires in the world. Also, Kordsa develops innovative and unique intermediate products and applications for composites technologies for the aerospace and automotive as well as sports equipment and marine. In the construction reinforcement industry, Kordsa touches every corner of life with more durable, practical and sustainable reinforcement solutions for both infrastructure and superstructure projects. (www.kordsa.com)

About Mandals
Mandals specialize in the manufacturing of high quality lay-flat hoses and circular shuttle looms. We are based in Mandal, on the southern coast of Norway and have been in business in the same location for nearly 250 years. We have come a long way since our establishment in 1775, and today we are one of the worlds most recognized manufacturers of lay-flat hoses and looms. 85% of our production is exported and Mandals products are found across the globe thanks to our long-standing partners and distributors.
(www.mandals.com)

About Michelin
Michelin, the leading mobility company, is dedicated to enhancing its clients' mobility, sustainably; designing and distributing the most suitable tires, services and solutions for its clients' needs; providing digital services, maps and guides to help enrich trips and travels and make them unique experiences; and developing high-

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technology materials that serve a variety of industries. Headquartered in Clermont-Ferrand, France, Michelin is present in 177 countries, has 124,760 employees and operates 68 tire production facilities which together produced around 173 million tires in 2021. (www.michelin.com)

About PPRIME
PPRIME Institute (P') is the second largest research laboratory of CNRS in the field of Physical Sciences for the Engineers (172 university researchers, 32 CNRS researchers, 165 doctoral students and 107 technical and administrative staff). Its research activities cover a large range of topics from physics of materials to fluid mechanics, tribology, and electrostatics. This multi- and trans-disciplinary expertise, recognized at both national and international levels, favors the synergies between different disciplines/subjects, and enable the institute to respond appropriately to the needs of the socio-economic sector. The privileged areas of application are transportation and energy, with special consideration given to environmental aspects.

About Synergies
SYNERGIES is a company working alongside 6 collectors and sorters of textiles, for the sorting and recycling of end-of-life clothing waste, work wear and postproduction textile, ultimately moving toward a full circular economy. Synergies TLC is developing an automated industrial sorting and dismantling process that will allow textile preparation to a level suitable to address large ranges of recycling applications. Synergies TLC work with its clients in the implementation of best practices (feedstock characterization, eco-design, etc.) and offers services adapted to each sorting and recovery solution (batch preparation, sorting experimentations, etc.).

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