AFTER-LIFE COMMUNICATION PLAN

"Upcycling post-consumer film from dirty Mechanical Recycling Facilities (MRFs)"

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PROJECTNAME:
AGANFOILS

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LIFE15 ENV/NL/000429

COMPANY:
ATTERO

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Project summary

Data Project	
Project location:	Wijster, The Netherlands
Project start date:	01/07/2016
Project end date:	30/09/2020
Total budget:	€ 13,029,578
EU contribution:	€ 3,021,554
(%) of eligible costs:	59.99%

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1 Introduction

Consumers are becoming increasingly aware of climate change and the importance of combating the waste of raw materials. Manufacturers of plastic products are responding to this. However, the transition to circular economy seems to be a long term process with many obstacles. To boost this transition the AGANFOILS Project has been initiated in 2016.

Attero is fully convinced of the concrete advantages that the AGANFOILS process brings to municipal plastic waste processing in terms of environmental benefits and market effects. The After LIFE Communication combines information about the optimization and dissemination activities that has been done throughout the project and describes what activities will take place after the project demonstration period. The After LIFE Plan will be divided in two sections:

1. Concise presentation of the AGANFOILS project, focusing on the project results, achievements, socio-economic impact. When relevant, information related to replicability and transferability will be highlighted
2. Summary of the dissemination and communication activities that have been organized for the project, message to stakeholders and strategy for future dissemination of the project.

This After LIFE Communication Plan intends to inform the public about the latest achieved results and further communication to interested parties, the Public and the Stakeholders.

1.1 Project objectives

The following project objectives were agreed upon the start of the AGANFOILS Project:

- Demonstrating that post-consumer foil can be recycled into a high quality plastic regranulate with a higher efficiency in a sustainable and economic way, reducing the need for virgin material
- Demonstrating an integrated full-industrial scale waste-to-resource plastic recycling process by using state of the art equipment in a smart sequence and combining the recycling stage with an existing MRF[1]
- Reducing the environmental impact of the plastic recycling process, through the efficient use of available residual energy and water streams and reduction of CO2 emission related to transport

The AGANFOILS project connected to a number of goals set out in the Roadmap for a Resource-Efficient Europe and the 7th EAP. Furthermore, the project matches perfectly with the LIFE “waste” priority topic. The advantages brought by this project in terms of waste recycling, emission reduction, natural resources and energy will attract the attention of other industries and policy makers.

1.2 Project results

The AGANFOILS Project led to a full scale operational facility which is unique for its kind. The facility processes all kind of LDPE foils from municipal waste, source separated by households or post separated by MRF[1], to a high quality of LDPE regranulate (Attero Infinite Film®).
The AGANFOILS Facility also uses maximum recovered energy (low-caloric steam) in order to boost up the environmental benefits. The AGANFOILS Plant is also identified as PRP, which stands for Polymer Recycling Plant.
The developed Process is proven sustainable and delivers a high potential for foil recycling companies.

[1] MRF - Materials recovery facility

AGANFOILS Results The enclosed table provides an overview of the results achieved by the Aganfoils plant		
	Actual Result	**AGANFOILS Project Goal (For Comparison)**
Processed foil (Tonne)	**11,279**	**12,000**
Produced Granulate (Tonne)	**4,660**	**5,900**
Electricity (kWh)	**9,229,728**	**10,840,000**
Steam (GJ)	**47,724**	**19,200**
CO2 reduction (kg CO2 eq.)	**7,083**	**555**
Water (Tonne)	**72,540**	**60,000**

1.3 Efficient recycling hub

With the AGANFOILS project Attero has proven that it is technically feasible to upcycle dirty packaging foil from residual waste to a high-grade plastic regranulate. This can be achieved with an extremely low CO2 footprint due to the intelligent use of heat from Attero's energy-from-waste plant and its own water-purification plant. This provides Attero with an extremely efficient recycling hub with many process steps:

- Post-separation of plastic from residual waste.
- Sorting by type of plastic (such as foil).
- Washing and flaking foil.
- Granulating into new plastic granules.

Attero's new Polymer Recycling Plant is the latest member of Attero's Green Plastics Valley we are proud of.

1.4 Socio-economic aspects

1.4.1 Regional Procurement

Despite that Attero has no eligible need to perform a European tendering method as public organizations should follow, A so called “Green Procurement Method” was introduced in order to gain maximun environmental advantage in the construction phase of the project. Over half of the procurement was done within The Netherlands; and all of the investments have been done within Europe. This means a maximum contribution to the European Economy and a minimized impact on the environment, since the materials needed for the AGANFOILS project have been purchased from as close as possible.

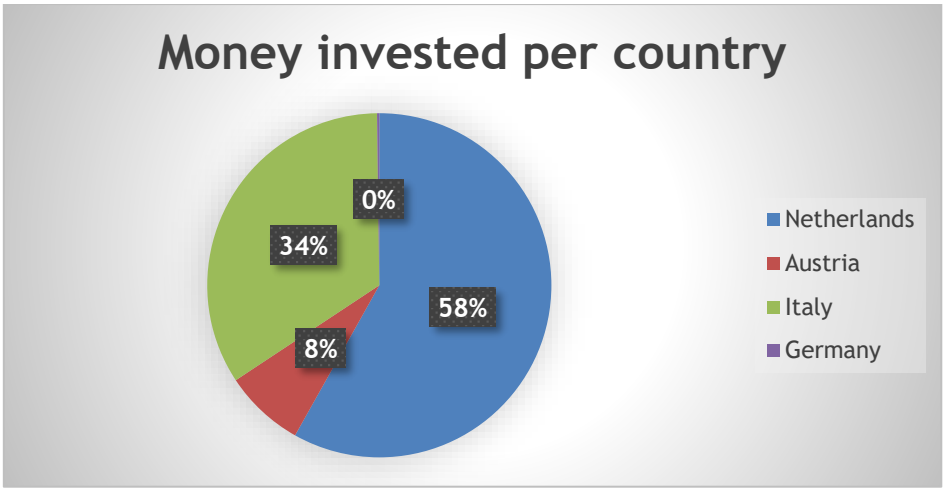

Figure 1: Distribution of invested expenditures

1.4.2 Jobs Created

Direct Jobs

The AGANFOILS factory is currently providing jobs for 32 FTE (Full Time Equivalent).

Indirect Jobs

We estimate that The AGANFOILS project has produced approximately 79 years of indirect FTE. The FTE can be divided into four different branches. The biggest branch is the Construction industry, followed by the Specialistic business service industry. Presumably the AGANFOILS project has provided for 57 years of FTE in the industry, mainly in The Netherlands and also for 22 years of FTE in the information, specialized, construction and hiring industry combined.

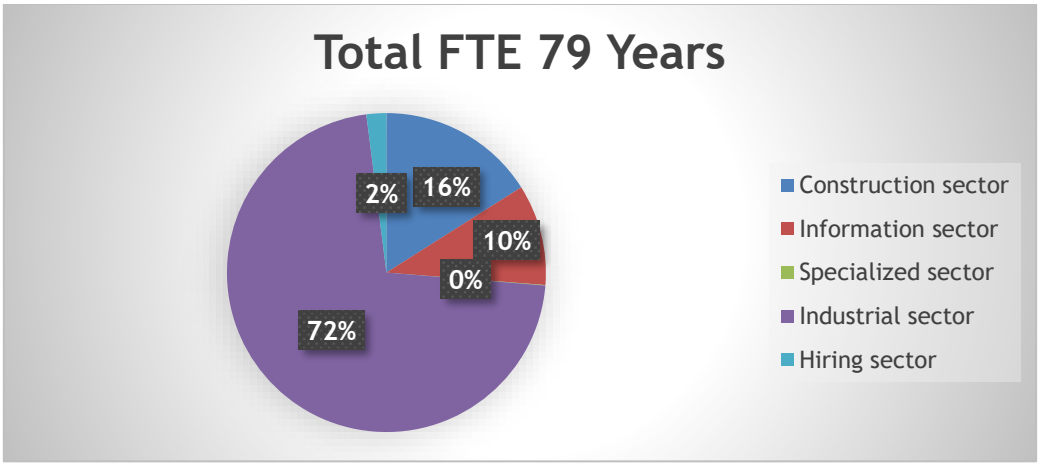

Figure 2: The Project personell achievements

2 After LIFE Communication Plan

2.1 Overview of dissemination and communication activities

Throughout the project Attero organized or participated in several dissemination and communication activities. Here is an example of events that have been organized over the last year(s):

- In December 2017 Attero has initiated a discussion with a company that has already participated in the LIFE program. Libbey is an old-established glass company that participated in development of sustainable glass manufacturing technology. Libbey kindly shared its knowledge and insight gained during the LIFE project.

- National Conference Circular Economy (February 2019): Attero was asked to pitch its innovative PRP during this conference that was organized by the Ministry of Environment and Infrastructure and Ministry of Economic Affairs and Climate in front of 600 attendees. Attero won the Circular Award Plastics 2019 for its innovation.

- Opening of the PRP by Mr. Frans Timmermans (March 2019): An extensive program was organized with the name "CIRCULAR ECONOMY = NOW'. In a big tent the opening speeches by Mr. Frans Timmermans and Attero's CEO Paul Ganzeboom were held, followed by the opening ceremony. An animation movie was shown that tied into the European pledge of Mr. Timmermans to stimulate the adoption of recycled content in new products. In the movie the technical steps of the process were animated and explained, using the original engineering plans of the PRP. The movie ended with the call to action to the audience: "How will you help?". Mr. Frans Timmermans and Attero gave interviews to the press and Mr. Frans Timmermans extensively mentioned the PRP initiative on national television during his presence at TV-Show 'De Wereld Draait Door'.

- KIDV Community of Practice (July 2019): Attero hosted a meeting with experts on design-for-recycling of flexible packaging in Wijster, organized by KIDV (Kennisinstituut Duurzaam Verpakken, Knowledge Institute Sustainable Packaging). Packaging producers, KIDV and technical experts (e.g. HTP Germany) discussed on how to better design and recycle flexible packaging such as crips bags.

- Visit from Ministry of Environment & Infrastructure (September 2019): Mrs. Esther de Kleuver, director department sustainable development and circular economy from the Ministry and Mrs. Wytske van der Mei, department manager, were visiting Attero for a discussion on waste treatment and recycling including a tour through different recycling activities among which the PRP.

- BNR Radio Green Quest (December 2019): Attero was interviewed on national Dutch radio channel BNR for being nominated for the BNR Radio Green Quest for green innovations. Attero was nominated for its innovations in the PRP.

- Dutch Waste Management Association 15 Year Anniversary (December 2019): Attero and two other waste management companies were asked to pitch innovations during the event the celebrate the 15th anniversary of the Dutch Waste Management Association were all major waste management companies including national government organizations and NGO's were present. Attero focused its pitch on the PRP.

- KIDV training workshops (January 2020): Attero hosted two full-day training workshops for the Knowledge Institute for Sustainable Packaging (KIDV). KIDV organized these master classes for packaging designers to share best practices on design-for-recycling. Attero provided the presentation room, coffee and lunch and provided a presentation and tour through the PRP.

- Visit from engineers from Ocean Clean Up (January 2020): A knowledge sharing meeting and tour were organized for a group of ten engineers from the Ocean Clean Up who want to develop a recycling system for waste that is collected from rivers (and from the ocean).

- Panel discussion at CEFLEX meeting (February 2020): Attero was asked to join in a panel discussion on producer responsibility schemes for plastic recycling during a CEFLEX meeting in London in front of 200 attendees from packaging producers, material producers, recyclers, and so on.
Attero is a member of different project teams that frequently meet to share knowledge and stimulate more and better recycling.

- CEFLEX: Attero is one of the founding members of CEFLEX (www.ceflex.eu). CEFLEX is the collaborative initiative of a European consortium of companies and associations representing the entire value chain of flexible packaging. The CEFLEX Mission is to further enhance the performance of flexible packaging in the circular economy by designing and advancing better system solutions identified through the collaboration of companies representing the entire value chain. Members include brand owners, convertors, materials producers and recyclers. Attero shares its knowledge with this project.

- The project has resulted in 2 kilometers of film production containing regranulate from Attero's PRP. Unfortunately the quality of Attero's regranulate was insufficient to scale up to full production at this time. The members continue to work together to achieve the desired results.

- Attero has contacted a local LIFE project (Bio Guardrail 4 yoUr Safety) to identify potential collaboration opportunities.

2.2 Message to stakeholders

So we now have a process that is running and ready to do what it is intended to do, but a regranulate that is too expensive to concur with virgin material. A big obstacle is that due to very low oil prices it has proven to be impossible to sell our regranulate at budgeted levels. More and more producers of plastic products feel economically forced to apply virgin plastics due to the low prices. Policy intervention is desperately needed to affect this situation and to enable the continuity of our investments.

Attero has continued its lobby activities to further promote circular economy and enhance the business case for post-consumer film recycling to a sustainable level.

The Circular Economy Action Plan also contains mandatory green public procurement. Governments have an enormous buying power that can change industries. If all European governments on all levels (including municipalities) buy products with recycled content then we will get the market demand that we need. Logically, this mandatory green public procurement will be brought in line consistently with the recycling targets. When the European Commission wants to recycle e.g. 50% of its plastics, then all governments should only buy products that contain at least 50% recycled plastics. If not everybody follows this rule then the demand for recycled material will again be insufficient, forcing recyclers to ship plastics outside of the EU. The Dutch government is far off from this logic by setting a completely insufficient target for circular procurement of 10% for eight purchasing categories for the national government level only.
Attero sent a Position Paper on the Circular Economy Action Plan to Dutch Members of Parliament to urge the quick implementation of the plan and to be a frontrunner by already setting higher green public procurement targets. The Position Paper was also sent to Jan Huitema, Member of the European Parliament and main negotiator on the Circular Economy Action Plan. Mr. Huitema visited the Polymer Recycling Plant together with a Dutch MP and had a lively discussion with Attero on the Circular Economy Action Plan.
The new Plastic Tax that is supposed to be introduced January 1st, 2021 can also help improve the business case of Attero's PRP. The Plastic Tax of €800 per ton is foreseen for all plastic packaging

waste that is not recycled in a Member State. The demand for recycling is likely to grow. The Plastic Tax is only focussed on plastic packaging waste however. Ideally all plastic products that are marketed with the European Union will be targeted. And even better: all virgin plastic products will be taxed. By shifting the Plastic Tax to taxing virgin plastics, the demand for recycled plastics will receive a boost. And finally, we will also need complimentary regulation to avoid products to be produced from alternative materials that harm the environment more severely than their plastics counterpart. For example, a recent study in the USA found that 38% of the burger and sandwich wrappers in fast food restaurants made from paper-fibre contains PFAS, a substance of concern that we do not want in our environment. We should strongly ban these polluting alternatives.

2.3 Future dissemination and communication strategy

2.3.1 Informing stakeholders

Our Polymer Recycling Plant (PRP) is continuing to receive attention from different stakeholders. Some recent examples are mentioned below.

Municipalities are interested to see how their packaging waste is being treated, how to receive information about this and how they can join a tour through the facility. The Dutch National Railways also brings its waste to Attero in Wijster and had a professional video made to inform all personnel with the Dutch National Railways on the improvements that have been made in their waste treatment including shots from the PRP. Also journalists contact Attero to hear how our plastics recycling business is doing and how policy development can help Europe to make steps towards a circular economy. We will continue to be in close contact with our stakeholders over the years and inform them on the importance of post-consumer film recycling in an environmentally sound way. The following channels will be used to disseminate this information:

- Website: Attero will post relevant information on the project's website (e.g. latest news in recycling industry; product quality updates; product application examples)
- Conferences and exhibitions: as soon as it will be possible Attero will restore its promotional activities by attending conferences and exhibitions.
- Workshops and trainings: based on the COVID-19 regulations Attero will consider hosting workshops and trainings to share best practices on design-for-recycling to packaging designers.
- CEFLEX: Attero will continue to participate in panel discussions organised by CEFLEX to further enhance the performance of flexible packaging in the circular economy by designing and advancing better system solutions.

2.3.2 Informing EU and Dutch Politics

Attero has undertaken many lobby initiatives. The message has stayed the same. We need a strong market demand for recycled plastics to enable the circular economy to flourish. At the opening event we started this lobby with an animation video where we asked to join Mr. Timmermans' pledge to apply recycled content rather than using virgin material if possible. We have repeated this message during many visits by Members of Parliament and the Ministry, to journalists and in own publications on social media.

We now see promising new policy proposals in the proposed Circular Economy Action Plan. Especially the mandatory application of recycled plastics in new products for packaging, construction and automotive is very promising. This is in line with the Plastic Tax that the United Kingdom will be introducing as of April 1st, 2022. Plastic packaging in the UK has to contain a minimum of 35% recycled content, otherwise a plastic tax is levied. A lot of recycled content is currently finding its way into construction and automotive. We therefore support the chosen route by the European Commission. What we need is a quick implementation of this legislation.

To accordingly contribute to policy development Attero has prepared and distributed a letter 'Opportunities and threats for flexible plastic film recycling in Europe' to European policymakers. In this letter Attero shares deep insights gained during the LIFE project execution, identifies future opportunities and threads for mechanical recycling and suggests further steps for policy makers.

Attero expects feedback on this letter from the European policymakers. Depending on the reaction, further communication steps will be made. As a possible next step, Attero is planning to forward this letter to the Directorate-General for Environment of the European Commission and Jan Huitema from the European Parliament.

To ensure its impact Attero will continue to participate in quarterly meetings with 'Afvalfonds Verpakkingen' ('Packaging Waste Fund') to help in implementing the Packaging Agreement and meeting the extended producer responsibilities. The results of the Aganfoils project will be used as a showcase and best practices will be highlighted.

Attero will continue to disseminate its vision on desired policy development through the different industry associations that Attero is a member of: Dutch Waste Management Association, BRBS Recycling,

NRK, PRE, BVSE and CEFLEX and by inviting policy makers in Brussels for a tour through our facilities and exchange of ideas.

2.3.3 Networking with potential customers

In order to get in touch with new potential customers, we plan to continue organizing and participating in activities that promote recycling and Circular Economy. These activities include:

- Visits to various trade fairs relating to the use of recycled content, including Fakuma (Friedrichshafen, DE), K-Messe (Düsseldorf, DE), Plastika (Malmö, DK), etc.
- Cooperation with partners in the supply chain, for instance the subsidized project Prolifex
- Organisation of Attero's Webinar, "Applying recycled content in your products"

- Active participation as a member in industry associations such as PRE, BVSE, CEFLEX

Attero maintains a dynamic list of potential customers for recyclate. Through the above-mentioned activities and desk research, this list is continuously updated. In this list, customers are categorised, sorted and then selected in order of potential and significance. Subsequently, the sales team actively approaches the selected customers by telephone, via a team meeting, by e-mail and finally physically.

2.3.4 Networking with other LIFE projects

It has been estimated that the Aganfoils project contributes to about 7 kt of CO_2 reduction per year. This significant environmental achievement has been reached largely by re-evaluating the supply chain and reducing the transport needs. Attero would like to pursue this route on the daily business operation but also in cooperation with other LIFE initiatives.
In order to keep the transport emissions as low as possible, Attero will firstly investigate the opportunities with local LIFE projects. The aim of this initiative is to identify business opportunities with other LIFE initiatives that might have a commercial mutual benefit as well as a positive environmental impact. These activities could include, but are not limited to:

- Making plant capacity available for processing waste plastic film (litter) collected from local natural areas (LIFE project sites)
- Supplying re-granulate to produce low carbon footprint products needed for other LIFE projects
- Communicate with other LIFE initiatives about future project opportunities

In the north of the Netherlands Attero has identified the following opportunities to pursue the above-mentioned activities:
Project name: Bio Guardrail 4 yoUr Safety LIFE 2015; BG4US LIFE 2015 - LIFE15 ENV/NL/000173
Project location: North Netherlands, Stadskanaal (around 30 km from the Aganfoils project site)
Information from the LIFE program data hub: “The production of zinc-coated metal guardrails has a considerable impact on the environment. On the one hand, the energy requirements for their production are very high, while on the other, during the lifetime of these guardrails, a considerable amount of zinc is emitted into the environment via corrosion, which leaches into soils, groundwater and surface water. Zinc adversely influences the biodiversity of plants and micro-organisms, and by accumulating in plants and animals in the food chain can cause human health problems. To overcome these problems, wooden guardrails were fabricated in 2003 that met the relevant legislative and safety requirements, but the concept was not economically competitive. Since then, biopolymer-based pultrusion and extrusion technologies have developed as proven sustainable technologies. These have good potential for producing price-competitive solutions to replace zinc-coated metal guardrails. The objective of the BG4US LIFE 2015 project is to produce a price-competitive bio-based guardrail, which will be demonstrated along a road. Guardrails are made of three parts: poles, guided rails and tongues. For the poles and guided rails, traditional metal components will be substituted with bio-composites. The project aims to optimise production at an industrial scale, using existing machines. The poles will be produced by an extrusion process, using CoFib (lignocellulose fibres made from agricultural waste or roadside grass and Solanyl (a second-generation bio-plastic obtained as a side-product of potato processing. The guided rails will be made in a pultrusion process (continuous moulding in which fibres and resin are combined, out of a suitable bio-based resin and PaPEC tapes (produced from the same raw material as CoFib. A 25-metre guardrail prototype will be assembled and pre-tested. Afterwards, crash testing will be performed on an optimised pilot guardrail of 100 m to obtain the necessary certification. Finally, field testing will be performed on a 375 m guardrail at a demonstration site, in cooperation with the Dutch Ministry of Infrastructure and Environment. The new guardrail will provide an environmentally friendly alternative to galvanised zinc guardrails, leading to potential zinc emission reductions of 18.8 tonnes/year in The Netherlands alone.”

Proposal from Attero: perform a feasibility study for replacing zinc-coated guardrails with LDPE re-granulate alternative. Conduct an LCA to determine the environmental benefit in terms of CO_2 reduction. This will be easy to do, because we have already calculated the carbon footprint of producing the re-granulate. Additionally, a more extensive environmental and safety impact

assessment needs to be performed to ensure that guardrails will not cause long-term soil and water contamination, as well as hazard to human and animal safety. Attero will not finance the above-mentioned studies, however, we are open to support this development as long as it is commercially and environmentally beneficial. Attero could provide re-granulate for testing.

The sales department of Attero, will consider including the beneficiaries of the LIFE projects in their network as potential customers or partners. Relevant business opportunities will be seriously evaluated by Attero. The New Business Development department of Attero will review local LIFE projects, to identify potential business and networking opportunities. In the course of 2021 Attero is planning to select and reach out to four LIFE projects. We will plan a meeting with these four projects to discuss the hurdles that we encountered and share lessons-learned. We encourage the project leaders of the LIFE projects to contact Attero about relevant LIFE initiatives that might create a synergy with the Aganfoils project.