LIFE
POLYPHOS ACID

Production of Polyphosphoric Acid using an innovative system based on the phosphoric acid wet process

PRAYON

After LIFE Communication Plan

2018

Table of content

LIFE Polyphos Acid factsheet

LIFE Polyphos Acid is co-financed by LIFE+, the financial instrument for the environment of the European Commission (LIFE12 ENV/BE/000205)

Duration: 2013-2017

Budget: 2,5 Million Euro

Goal: the aim of the LIFE Polyphos Acid project is to offer a solution to the reduction of the carbon footprint and to the non-valorised wastes in the context of the polyphosphoric acid production.

Project demonstration site: Engis, Belgium

Project website:

http://www.prayon.com/en/our-activities/innovations/Life-polyphos-acid.php

1. Introduction

The After-LIFE communication plan describes the actions that will be carried out to disseminate the results of the project LIFE Polyphos Acid, after its closure. This document takes into account all aspects that could be transferable but also the strategy (operational and financial) that will be put in place to ensure the continuous and long-term dissemination of project results. To do this, the After-LIFE Communication Plan will be included in PRAYON's overall strategy to conduct other specific communication and marketing events.

Through the After-LIFE communication plan, we want to reach a wide audience (industrial players, producers and consumers of polyphosphoric acid) public bodies, authorities (European Commission - DG Environment, Belgium and French Ministries of Environment - at least , Walloon Region) after the completion of the project.

2. The LIFE Polyphos Acid Project

a. Context and objective

With a share of more than 30% of total industrial energy consumption worldwide (including raw materials), the chemical and petrochemical sector is by far the largest consumer of energy in the industry. The sector faces the challenge of saving energy mainly for economic and environmental reasons (OECD / IEA Report, 2009). According to the European Environment Agency (EEA), the European chemical industry, including pharmaceuticals, emits more than 140 million tonnes of CO_2 equivalent per year.

The phosphate industry is obviously concerned by this challenge and the LIFE Polyphos Acid project is expected to offer a solution to the reduction of carbon footprint and non-recovered waste in the production of Polyphosphoric Acid.

The ever increasing production of polyphosphoric acid is linked to the growing demand in several sectors (pharmaceutical, cosmetic, petrochemical, road construction - asphalt, textile industry, water treatment industry, fertilizers, etc.). The world production reaches more than 50 Kt (source: PRAYON) of which 60% (31.91 kT) are made via the thermal process, which is the least ecological and the least efficient.

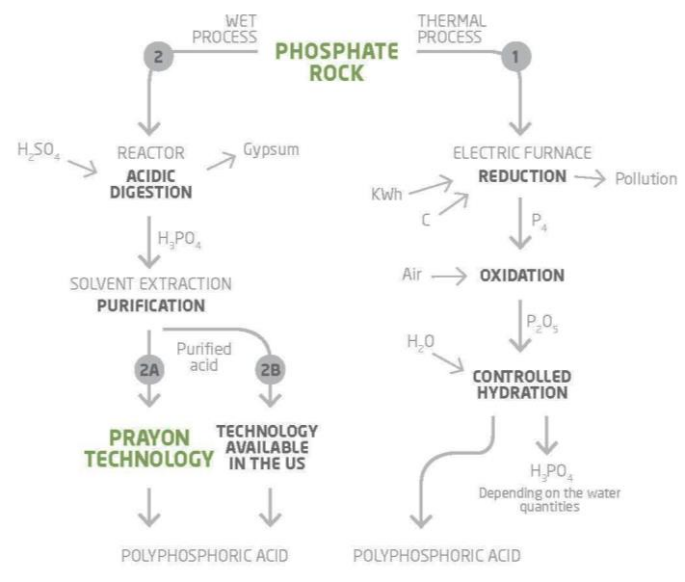
LIFE Polyphos Acid is not just a technical demonstrator. It is obvious that more can and should be done in terms of energy consumption (reduction of greenhouse gas emissions), compactness of equipment and recovery of waste.

The project aims to produce highly purified polyphosphoric acid (85% P_2O_5) by an innovative wet process. This process is less polluting and more energy efficient, but more complex and therefore not widely used.

The LIFE Polyphos Acid project aims to provide a complete solution that not only complies with existing standards, but goes far beyond them.

With this patented process, Prayon first aims to reduce the carbon footprint of polyphosphoric acid production:

- by reducing energy consumption;
- using a much more compact system than the best available technologies (BAT).



Comparison of the different processes

b. Activities

During the project, the team developed and built, at the Prayon site in Engis, a demonstrator consisting of a flame chamber (the 1st subsystem and the main innovative element), a recovery unit mass and energy (2nd critical subsystem), and finally a gas treatment equipment.

The flame chamber was installed in February 2016. The five test campaigns carried out since 2014 validated and closed the activities related to the control and installation of the flame chamber. The start of operations, tests and adjustments was then started in March 2016. The major risk is the breakage of silicon carbide elements that require up to 6 months of manufacturing time. Particular attention was therefore paid during the first test campaign, which led to the following conclusions:

- good sealing and excellent thermal insulation of the combustion chamber,
- very good quality of the polyphosphoric acid produced.

The first months of 2017 were devoted to ordering the latest components and instruments needed for installation. The summer of 2017 allowed the assembly of the recuperator, the gas washer as well as the numerous piping, power supplies and instrumentation related to it to finalize the construction of the prototype.

In parallel, the monitoring activities continued their course to ensure the proper implementation of the pilot and the achievement of technical, environmental and socio-economic objectives.

c. Results

As a reminder, the LIFE Polyphos Acid project aimed to develop and validate an innovative process for the production of polyphosphoric acid based on the phosphoric acid wet process with the following expected results:

- Reduced carbon footprint with a 54% reduction in CO_2 emissions and a reduction in energy consumption.
- Reduction of the materials necessary for the implementation of the process: (the reduction of the volume of the installation up to 80% and the reduction of the mass, 50%).

The Life Project and the development of the demonstrator allowed to validate a certain number of hypotheses emitted at the beginning of this one:

- The demonstrator allowed us to produce a polyphosphoric acid of high quality and high purity, having a very important attraction for the process compared to existing processes.
- The choice of materials used, despite the difficulties encountered in identifying reliable suppliers, proved to be a good choice (resistance, low product contamination, energy consumption, etc.).
- The compact system put in place has many advantages both in terms of reproducibility and the necessary investment and maintenance costs to be expected, representing a promising competitive advantage.

d. Replicability and transferability

Replication has been considered to be possible on a larger scale, especially in countries where the thermal process is still widely used (Asian countries in particular) and where PRAYON technology is already in place (in more than 140 plants in 30 countries; more than 50% of phosphoric acid production worldwide). The benefits to the environment and the economy should be able to facilitate the adoption of this innovative system by the legislator and allow the acceleration of the deployment of technology and thus generate a virtuous circle.

Main EU policies targeted:

- Energy Efficiency: Energy Efficiency Directive (2012) sets the framework for measures to promote energy efficiency across the EU and help the EU reduce its energy consumption by 20%,
- Reduction of greenhouse gas emissions: 2030 Climate Framework for reducing greenhouse gases in the period until 2030 to continue the trajectory toward a low-carbon economy in the period beyond 2020.
- Waste management: Waste Directive 2008/98/EC requiring Member States to establish waste prevention programs. The Waste Framework Directive has evolved over the last 30 years through a series of environmental action plans and a framework of legislation that aims to reduce negative environmental and health impacts and create an energy and resource-efficient economy.

In the longer term, PRAYON has great ambitions for the polyphosphoric acid production process that it has developed.

In addition to the construction of an industrial facility on one of its sites, for the sale of polyphosphoric acid in large quantities (several thousand tons), PRAYON also plans to commercialize this innovative patented technology through the sale of licenses to economic actors who would be interested in replacing their current process of polyphosphoric acid or who would like to introduce a new one in their production process.

3. Communication Strategy

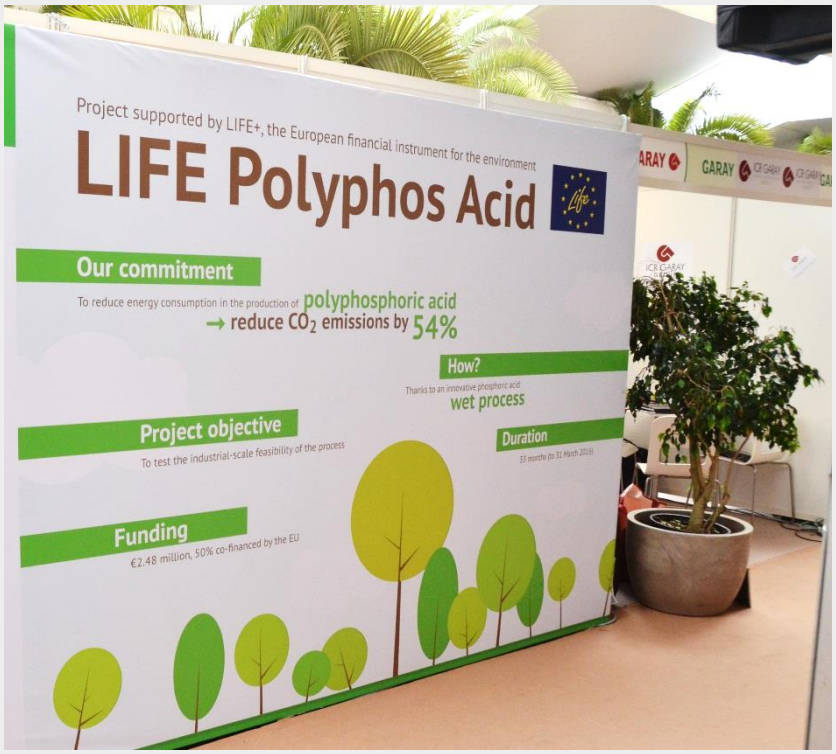
a. Objectives

As part of the After-Life Communication Plan, we plan to continue dissemination activities to a wider audience after the completion of the project. The effectiveness of the After-LIFE Communication Plan will be enhanced by the availability of the "Layman's Report" on the website, as well as the opportunity to view the project activities on the website.

b. Dissemination activities during the Project

The dissemination activities and their focus on the significant environmental benefits of the project allow a good visibility and attractiveness of the project. A wide range of targets has been covered, ranging from the general public and potential end-users to important players in the industry in Wallonia:

- Dissemination within the PRAYON group through internal meetings, also with representatives of other Group factories from different countries;
- Dissemination within the phosphate industry: among equipment suppliers from different countries, business partners and potential customers (through international trade fairs and exhibitions and in particular the SYMPHOS, dedicated to innovative processes in the field of phosphate industry - 2015 and 2017);
- Dissemination to public authorities and local authorities as well as end-users: through articles, demonstrator visits, conferences and local presentations;
- Dissemination to the general public and end-users: through the project website, roll-ups installed on each of the PRAYON sites and information board at the head office.



c. Dissemination activities on short and long term perspective

Dissemination activities also continue after the end of the project, through the website, participation in various events, site visits or presentations of the project to different organizations and authorities.

The website will continue to be active five years after the end of the project and will be updated with the latest results and developments. The site will host the Layman's Report publication presenting the project and the latest results from the end of the project.

It is also possible to quote:

- demonstrator meetings and visits with customers, producers or suppliers of equipment on the PRAYON site;
- highlighting the demonstrator in the specialized press.
- the publication of a brochure in paper format and downloadable on the website with the latest results obtained during the next test campaigns.
- participation in various fairs, exhibitions, symposia and conferences in 2018 and 2019 (e.g. European Phosphorus Sustainable Conference and SYMPHOS 2019).

In the longer term, based on the results obtained during our next test campaigns and the subsequent decision of PRAYON to evaluate the feasibility and finally to undertake the construction of an industrial production unit, these circumstances may justify an intensification of dissemination actions both with potential industrial partners (customers, suppliers, licensees) and local and regional authorities.

The announcement of this industrial investment will certainly involve holding a press conference with the aim of highlighting the benefits of the LIFE project and the environmental benefits of the process developed.

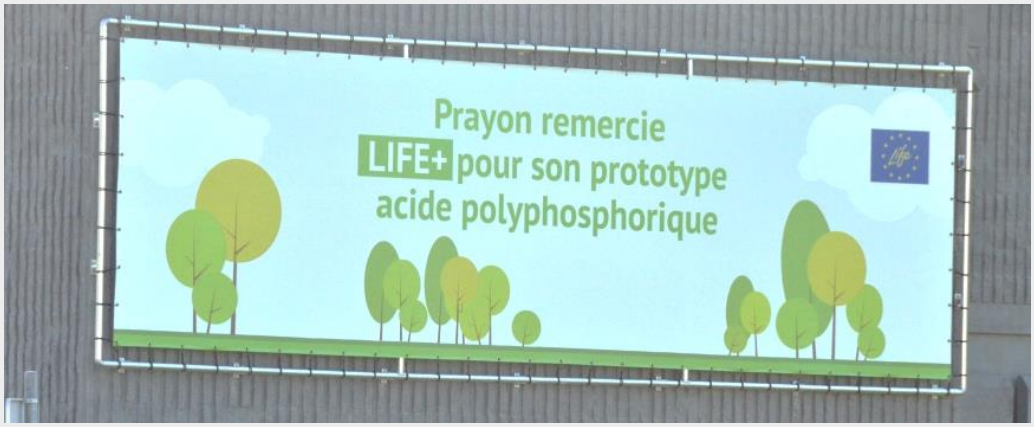
This event will be reflected significantly in the internal and external communication of the group and in the public communication, and will offer the opportunity to talk about the origins of this development and the project Life Polyphos Acid.

Another opportunity for communication in longer perspective is offered by the transition to the circular economy (Phosphate - Recycling). The Walloon government is increasingly supporting the industry's transition to circularity, and NGOs continue to promote it as a viable alternative and, as a result, the media and public awareness of this is increasing.

With this trend, there will likely be even more opportunities in the medium and long term to draw attention to the Life Polyphos Acid project and to communicate on its results.

In this perspective, PRAYON plans to coordinate the activities summarized in the following table:

Dissemination tools	Targeted stakeholders	Means	Expected costs (funded on own funds)
Website maintenance	All stakeholders	The project website will be maintained active at least 5 years after the end of project to promote the goals and the results achieved.	5*1000 €
Production et distribution des brochures et du Layman's report remis aux visiteurs et durant les évènements de dissémination	All stakeholders	These communication tools will be published at the end of the year 2018. It is planned to print 300 copies brochures and 2 * 100 copies of the Layman's Report.	2500 €
Publication d'articles dans la presse spécialisée	All stakeholders	1-2 articles per year (at least until 2020) are planned for publication in the specialized press	2000 €
Participation à des conférences, foires et expositions (brochures et roll-up utilisés)	All stakeholders	2 participations per year (at least until 2020) are planned	10.000 €
Visites guidées	Industries and prospects	4 visits per year at least until 2020	2000 €



For more Information

PRAYON S.A.

Rue Joseph Wauters 144
B-4480 ENGIS, Belgium

Tel. (+32) 4.273.92.11
Fax. (+32) 4.275.62.10

Contact Person: M. F. GEVERS

Website:

http://www.prayon.com/fr/nos-activites/innovations/life-polyphos-acid.php