Earthwake introduction

Our team and missions

REPURPOSE PLASTIC WASTE INTO ENERGY SOURCES

Every year, 11 millions of tons of plastic waste are discharged in the ocean. If we don't act now, those data could triple before 2040.

Through their humanitarian trips, Samuel Le Bihan, engaged comedian, and François Danel, former Action Contre la Faim chief executive, have witnessed on **land and sea devastation** due to plastic waste

In 2014, they decide to create Earthwake in order to develop **concret solutions** to cease plastic waste drain, in France as in emerging countries.

Quickly, Christofer Costes caught up with Earthwake founders. It led to a first response to the plastic drain : **Chrysalis**, a pyrolysis equipment capable to **repurpose plastic waste into energy**.

Chrysalis innovation

A PROMPT AND UNPRECEDENTED RESPONSE

AGAINST PLASTIC POLLUTION EMERGENCY

Thought through and build up in France by Christofer Costes, developed by Earthwake, Chrysalis produces secondary raw material - such as diesel - by **repurposing non-recyclable plastic waste.**
It aims to be an action-oriented solution to strive to stop plastic waste to end up in our lands and oceans.

Auto-efficient machine, movable and of high technicality

Chrysalis is capable to daily repurpose 160kg of polyethylene and polypropylene into **120L of diesel**. It is done by plastic going through a pyrolysis process - combustion without oxygen -.
The distillation of the pyrolyzed products then makes it possible to produce fuel, as well as gas, which is used in closed circuits in order to supply the machine with energy, making the Chrysalis a **self-sufficient equipment**.
Moreover, Chrysalis will be put in containers to be **easily movable**. This way, Chrysalis will be easily send over to the most polluted areas.

TO CONCLUDE, CHRYSALIS HAS VARIOUS BENEFITS

A low-tech solution to develop low-budget eequipments

An alternative to landfilled and combustion within containers

An easily moveable solution to be promptly implemented in polluted area

Self-efficient in energyn using gas produced by the previous batch to operate

Key figures

-80 %

Greenhouse gas released to produce fuel by Chrysalis compared to regular fossil extraction according to researches on life cycle conducted by experts

160 KG

Daily plastic waste that can be recycled by Chrysalis.

48 TONNES

Yearly plastic waste that can be repurpose by Earthwake.

2 NEW JOBS

Each unit creates 2 operator jobs. They don't require specific diplomas appart from a training provided directly by Earthwake.

N°2 AND 4 :

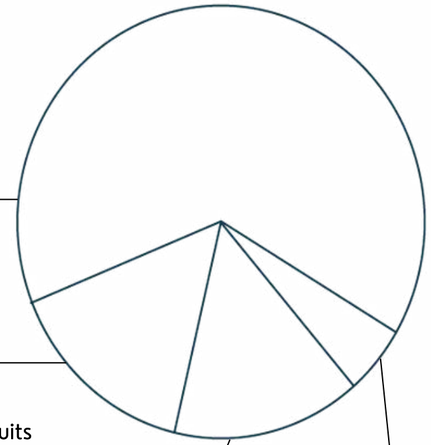
Polyethylene - PE (N°2 and 4 of the plastics classification system) : plastic bags, bottles (detergent, cosmetics), containers, wraps, tape can all be managed by Chrysalis.

N° 5

Polypropylene - PP (N°5 of the plastics classification system) : basins, buckets, toys, garden furnitures can also be managed by Chrysalis.

TO CONCLUDE, PERCENTAGES

FOR THE ZEALOUS ONES



65 % of diesel

15 % of gasoline

15 % of gas used in closed circuits in order to supply the machine with energy, making the Chrysalis a self-sufficient equipment

5 % of carbonaceous residue
Lab research are going on to find a way to reuse those residue.

= TOTAL OUTPUT FROM CHRYSALIS

A proven concept

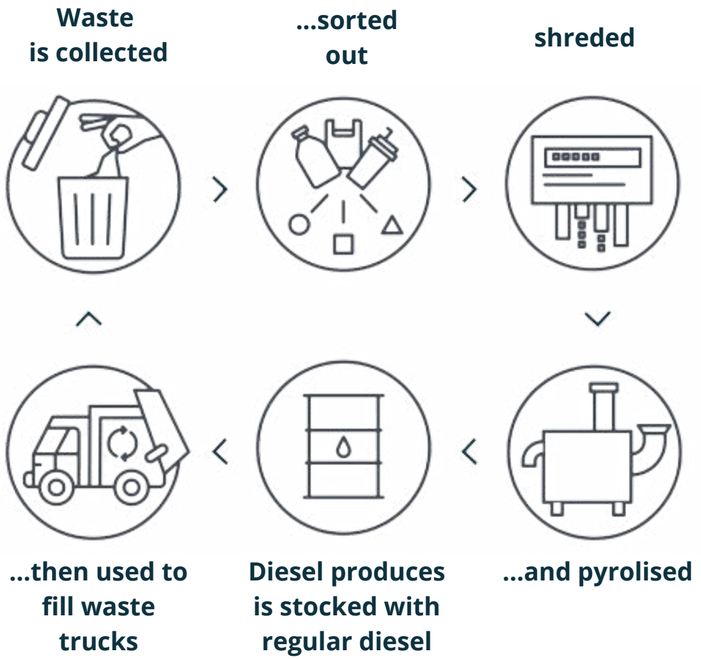
OUR PILOT PROJECT IN PUGET-THÉNIERS

WASTE TRUCKS FILLED WITH PLASTIC DIESEL

Though our pilot projet in Puget-Théniers on July 17th 2020, we have proven that **our technology is working**.

Chrysalis is nested in an **innovative circular economy model**. The waste trucks of the Communauté de Communes Alpes Azur (CCAA) collect, in the city, household waste and is running with plastic diesel.
By means of chemical recycling developed by Earthwake, polyethylene and polypropylene plastics collected by the trucks will be processed into fuel. This plastic oil will then be blended with regular diesel to supply the trucks.

Earthwake received a specific waiver from the Direction Générale de l'Energie et du Climat du Ministère de la Transition Ecologique et Solidaire authorizing this blend



International development

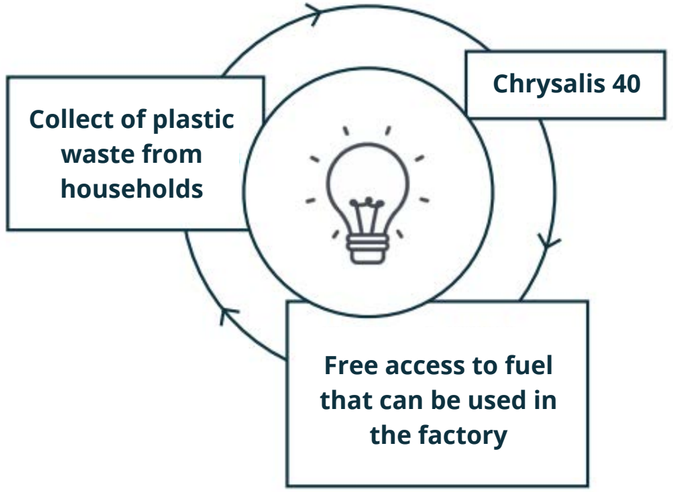
PILOT PROGRAM : THIÈS, SENEGAL

We would like to set up a Chrysalis unit at the recycling site of **Proplast in Thiès**. Proplast is a partner of choice for Earthwake, for their strong skill as well as their history.

Indeed, Proplast was created as a cooperative in 1997 by women living in Thiès. They rallied to fight plastic pollution in their streets by establishing a recycling site. The **processing centre** is a great exemple of viable circular economy.

Collector and processor jobs had to be created to make this site function. The jobs were given to unemployed women and young people. The goal is pretty clear : to create a circular economy around recycling in order to positively impact employment and environmental protection

Thiès site has a continuous arrival of plastic waste that could be transformed by Chrysalis. Earthwake innovation will let Proplast **diversify its recycling methods** and also to use the fuel to supply the recycling plant.



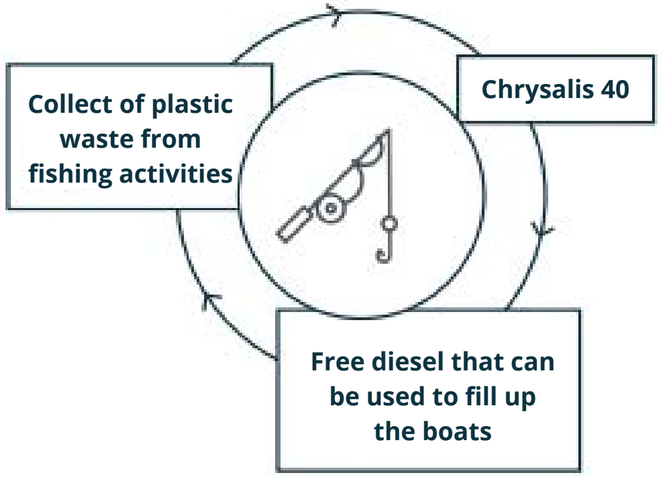
International development

PILOT PROGRAM : KERKENNAH ISLANDS IN TUNISIA

This program will be in partnership with the NGO SMILO, assigned by the Ministère des Affaires Locales. Et de l'Environnement in order to put up a solution to the **abandonment of plastic fishing nets at sea**.

The first SMILO sponsor research showed that plastic pollution coming from this fishing represents more than 600 tons of plastics yearly, with a rate up to 60% abandoned at sea. Earthwake, in a partnership with SMILO would like to implement a **circular recycling economy system** on the islands. The idea is to set up a Chrysalis unit to collect and recycle plastic fishing nets.

A Chrysalis unit would encourage fishermen to bring back their plastic waste instead of throwing it at sea by giving them back the fuel made by the waste they brought in. This fuel can be use by the fishermen to fill their motorized boats. We would then have implemented a **perfect circular economy.**



Next steps

UPGRADE CHRYSALIS' EQUIPMENT

AND DEVELOP COMMERCIAL SOLUTION

Currently, our technical team is fully focused on **improving Chrysalis** to make its use easier to use and more efficient. Alongside this upgrading work, we are testing **more types of plastic** to determine which ones would also work in Chrysalis and thus expand our transforming capacity.
We also started the process to have the **CE and ATEX norm certifications** so Chrysalis is pithing European security law.

This experimental phase is essential before we launch the manufacturing and commercialization of Chrysalis units, scheduled by the **end of 2021**.
Furthermore, pilote projects developed in 2021 will help us see how Chrysalis is responding in specific area, in order to always keep improving our technology.