CORFU2022

9th International Conference on Sustainable Solid Waste Management

15-18 JUNE 2022

ROOM 2
SESSION II

Circular Economy & Symbiosis Networks
Chair: D. Hidalgo, D. San Martin, A. Luciano

CHANGING PERSPECTIVES: FROM WASTE AND WASTEWATER MANAGEMENT TO SIDE-STREAM VALORISATION

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Circular economy in the fish canning industry

The fish canning sector is characterized by the low utilization of the main raw material (for example, 40-60% tuna) and higher water consumption in its processing lines. However, it is one of the food sectors with the highest intensity of recovery of by-products for direct use as fishmeal.

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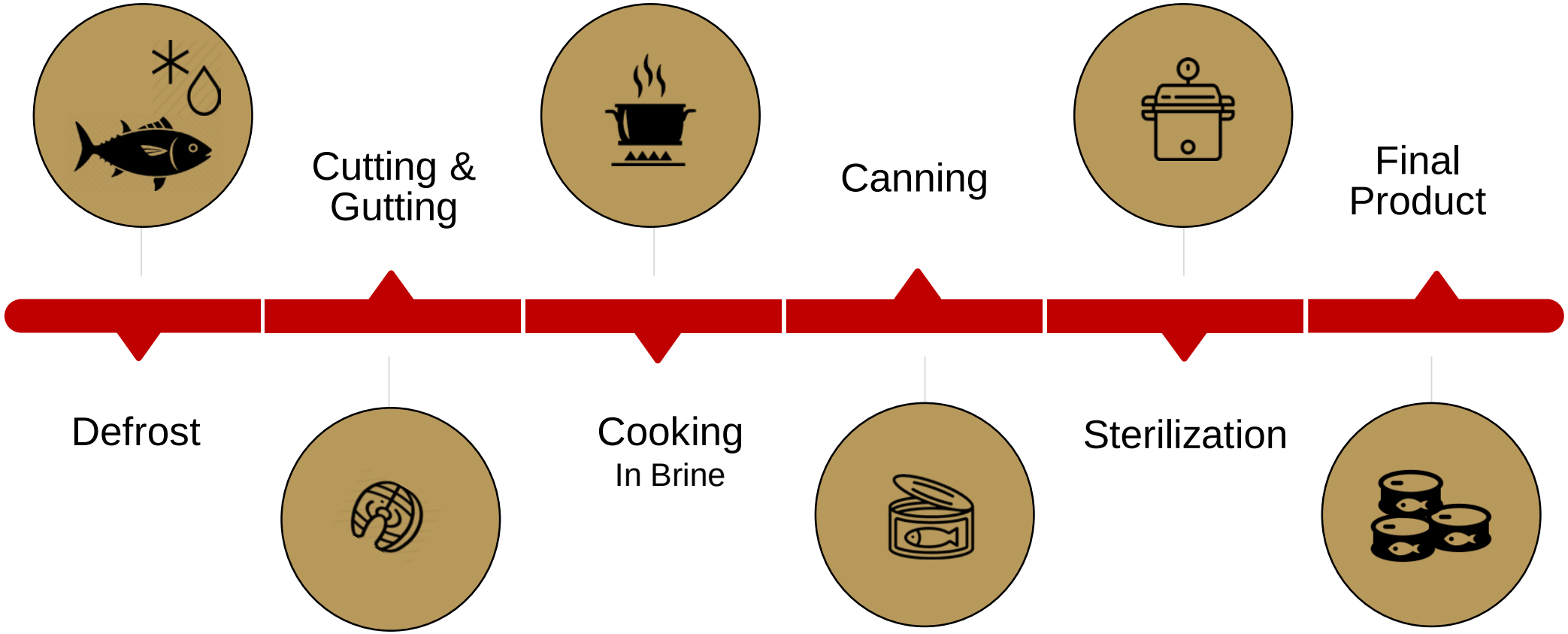
PRODUCTION PROCESS



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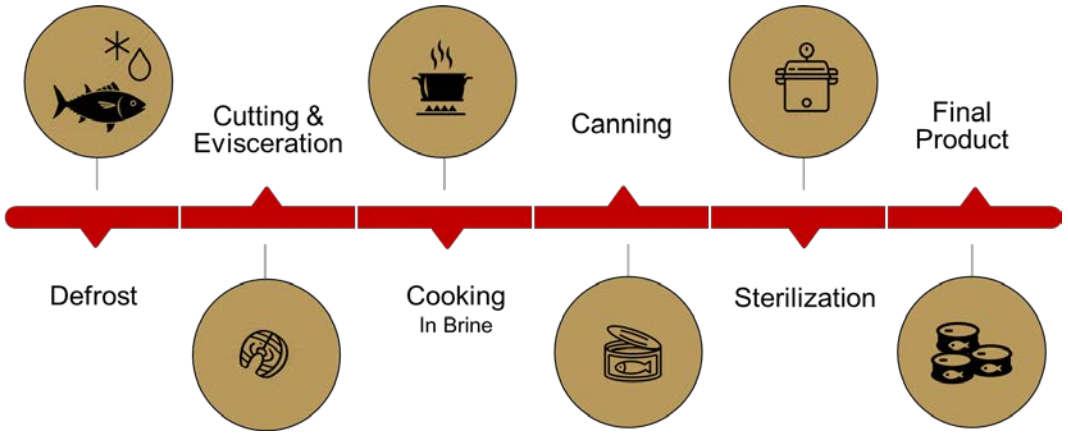

Byproducts & waste:

→ Heads
→ Bones
→ Skin
→ Vistera

→ **FISHMEAL**

Wastewater:

→ Sewage load
→ High fats and grease content
→ High salinity
→ High temperature

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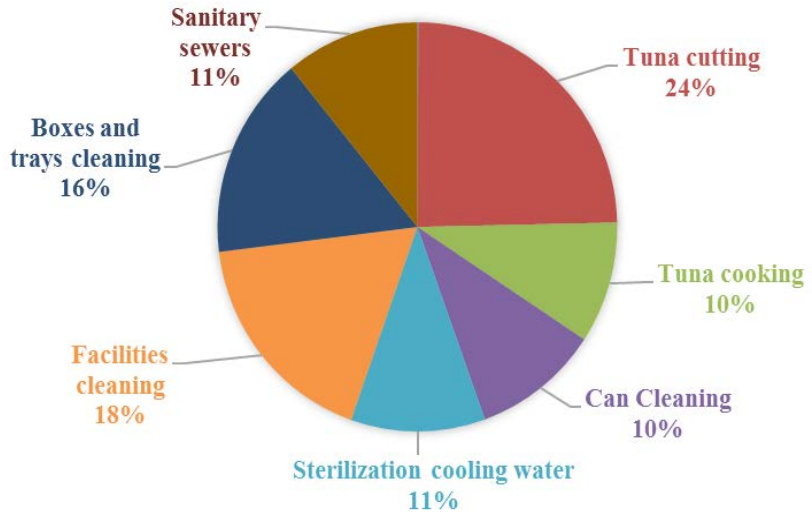
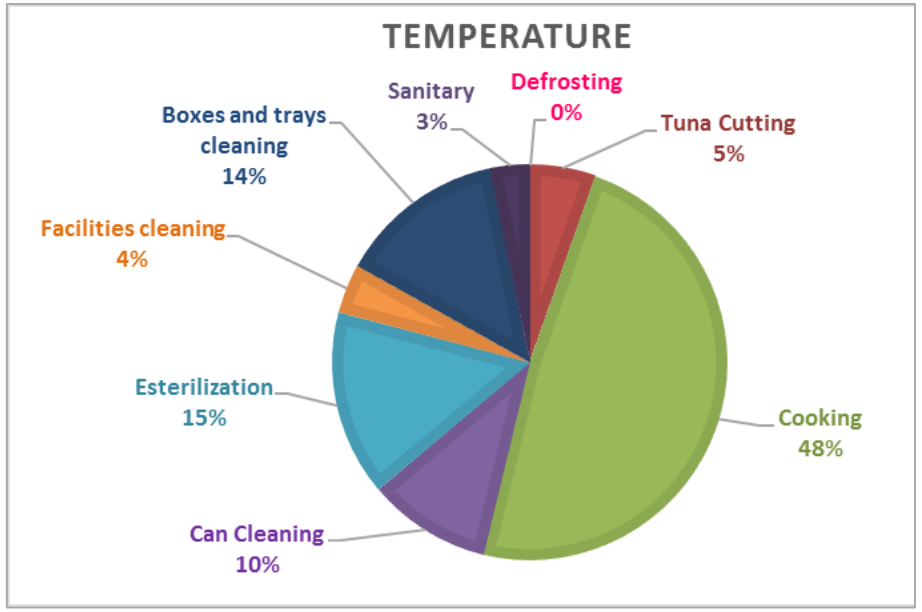
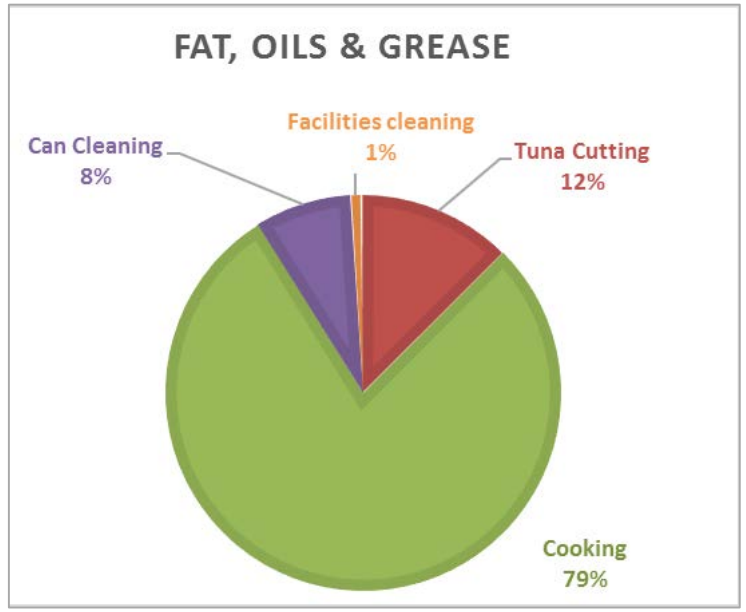
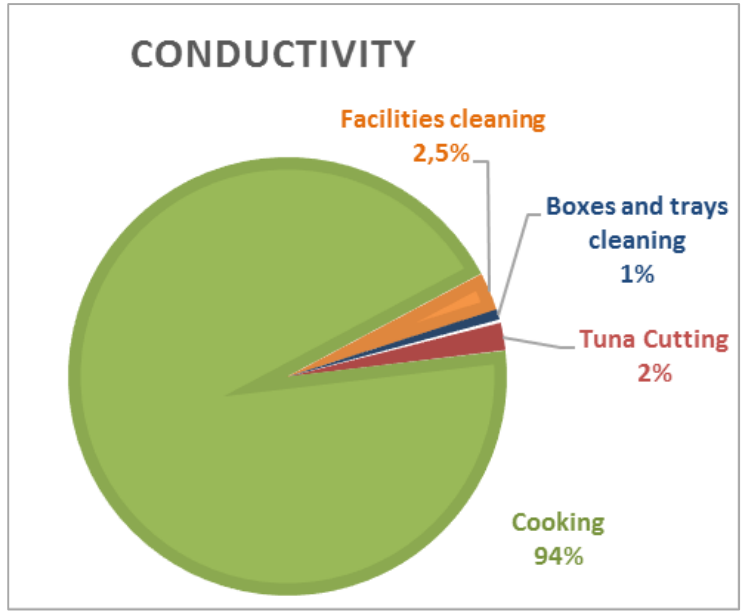
Water Consumption



Main pollution of effluents







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CHANGING PERSPECTIVES: FROM WASTE AND WASTEWATER MANAGEMENT TO SIDE-STREAM VALORISATION

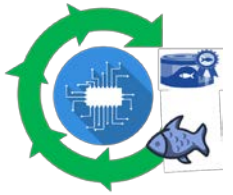
1. Improving **Eco-Efficiency** in the proceses

vertalim
Safe discharges, life source

2. **Regeneration** of food brines and fish proteins **upcycling**

RESALTUN project

3. Intelligent waste & loss monitoring: Use of **IoT & AI**



iFishCan

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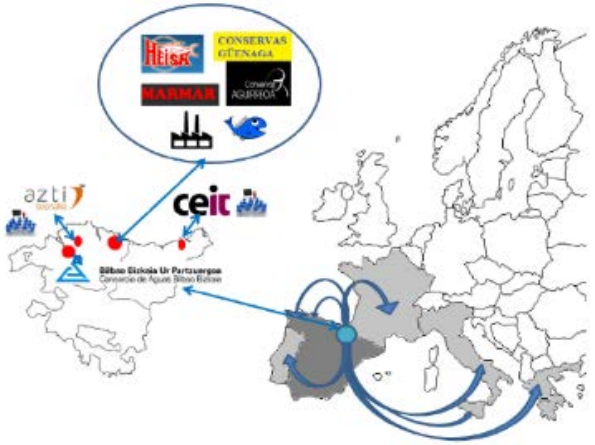
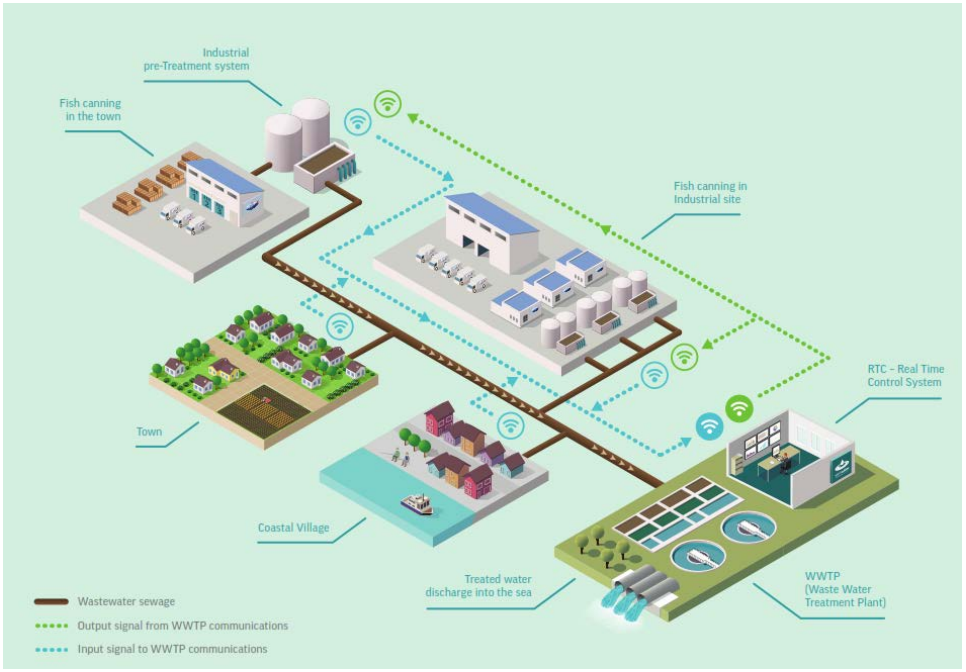
vertalim
Safe discharges, life source

ENVIRONMENT
LIFE Programme

Objective:

Demonstration of an integrated solution (technical, legislative and environmental) for reduction at the origin and the controlled integration of high organic and saline load discharges from the SME's canning industry in the urban sanitation system.





Levels Project performance

Level 1 - Tuna canning industry

Strategies for the minimization of highly polluted effluents and secondary raw material

Level 2 - Sewerage system

Develop and model a virtual simulation platform integrating industrial pretreatments, collector network and WWTP

Level 3 - Environment

Monitoring the impact of the project actions on the environment

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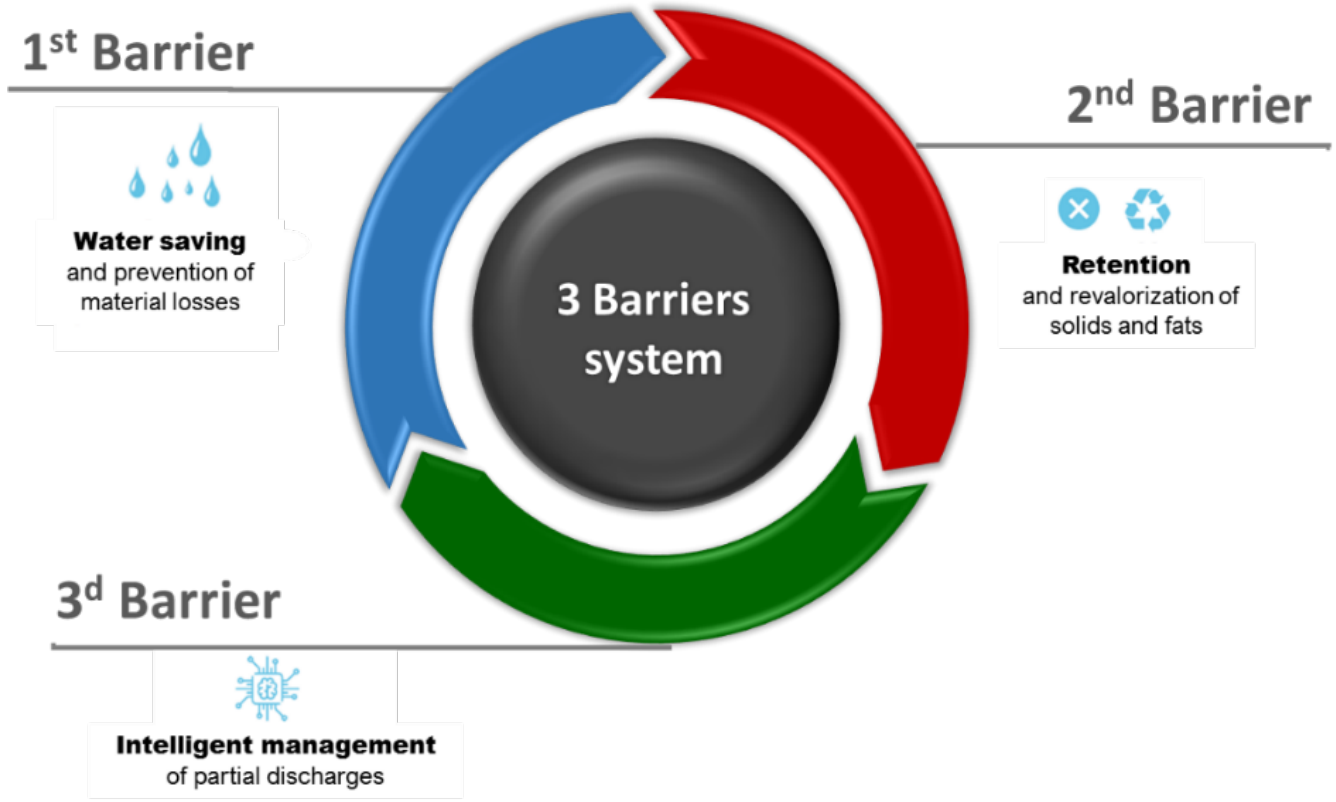
3 Barrier System



Sistema 3 Barreras

vertalim
Safe discharges, life source

1st BARRIER

- **Water consumption reduction in productive and auxiliary processes**
- **Avoid the loss of raw** material and products and its disposal in wastewater

Water savings

- Installation of a pass sensor for tuna pieces
- Replacement of more efficient diffusers

Avoid loss of raw material

- Installation of baffles to avoid loss of raw material
- Install trays for the hygienic collection of tuna crumbs

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Sistema 3 Barreras

2nd BARRIER

Retention of solids and food fractions in a hygienic way through specific systems and technologies that allow their recovery

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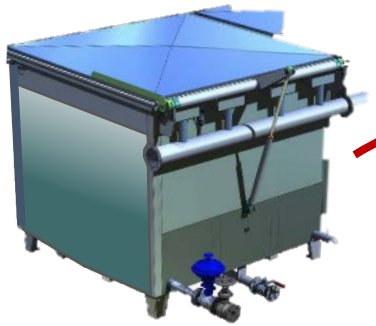
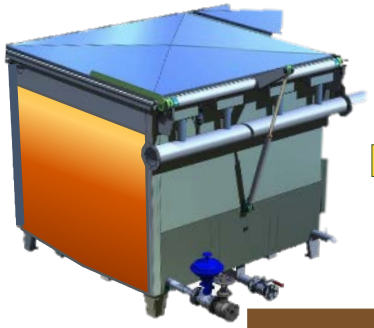
Safe discharges, life source



Tuna cooking



1. Oil Valorisation

2. Recovered brine

Fish remains Valorisation

Nanofiltration

3. Protein concentrated Valorisation

Example:
Integral recovery of cooking brines

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Sistema 3 Barreras

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Safe discharges, life source

3rd BARRIER

Intelligent internal management of partial discharges, through temporary storage, partial treatment, reuse before being discharged

Example: Recovery of sterilizer cooling water for internal reuse in floors cleaning or other uses

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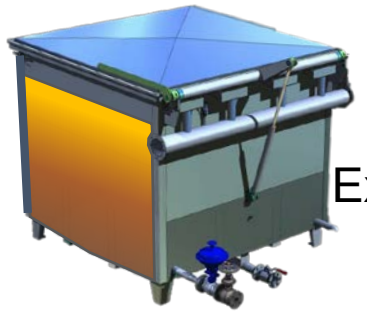
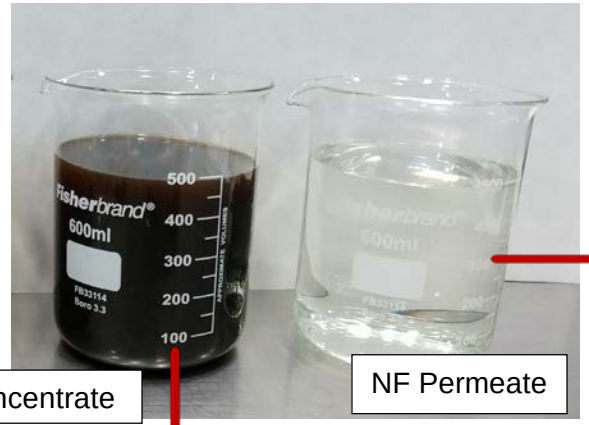
RESALTUN Project: UPCYCLING OF BY-PRODUCTS



Exhausted brine

Nanofiltration



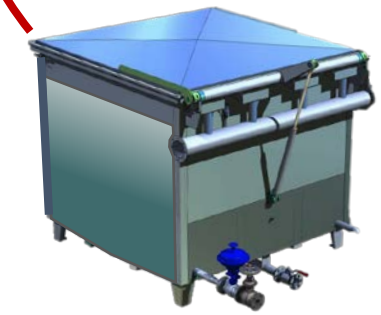
NF Concentrate

NF Permeate

Brine recovered for reuse

Protein concentration from 6 – 8 g/L to 25-36 g/L for use in savoury or fertilizer industries

Recovered brine



Fish protein Upcycling System

SERRATS
Arte en conserva

EUSKO JAURLARITZA GOBIERNO VASCO
EKONOMIAREN GARAPEN ETA AZPIEGITURA SAILA
DEPARTAMENTO DE DESARROLLO ECONÓMICO E INFRAESTRUCTURAS

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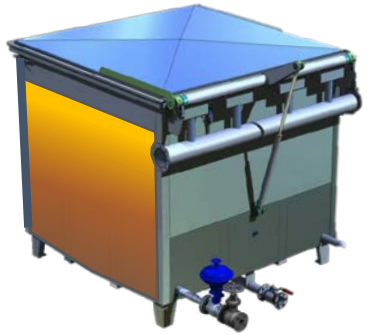
RESALTUN Project: UPCYCLING OF FISH BY-PRODUCTS



Fish Oil

Fish meal

Animal Feed

Fertilizers

Pharmaceutical industry

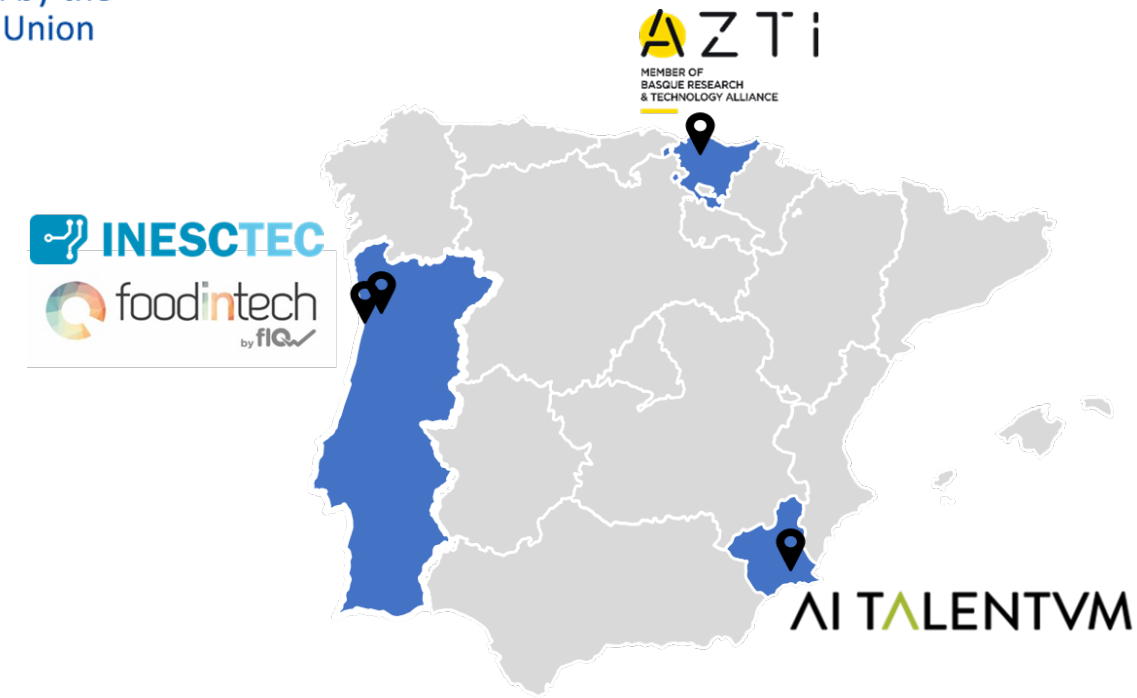
Nutraceutical industry

iFishCan – intelligent waste & loss monitoring test bed for the Fish Canning industry

Co-funded by the European Union

OBJECTIVE

Improving the performance and sustainability of the fish canning sector through digitalization and Artificial Intelligence



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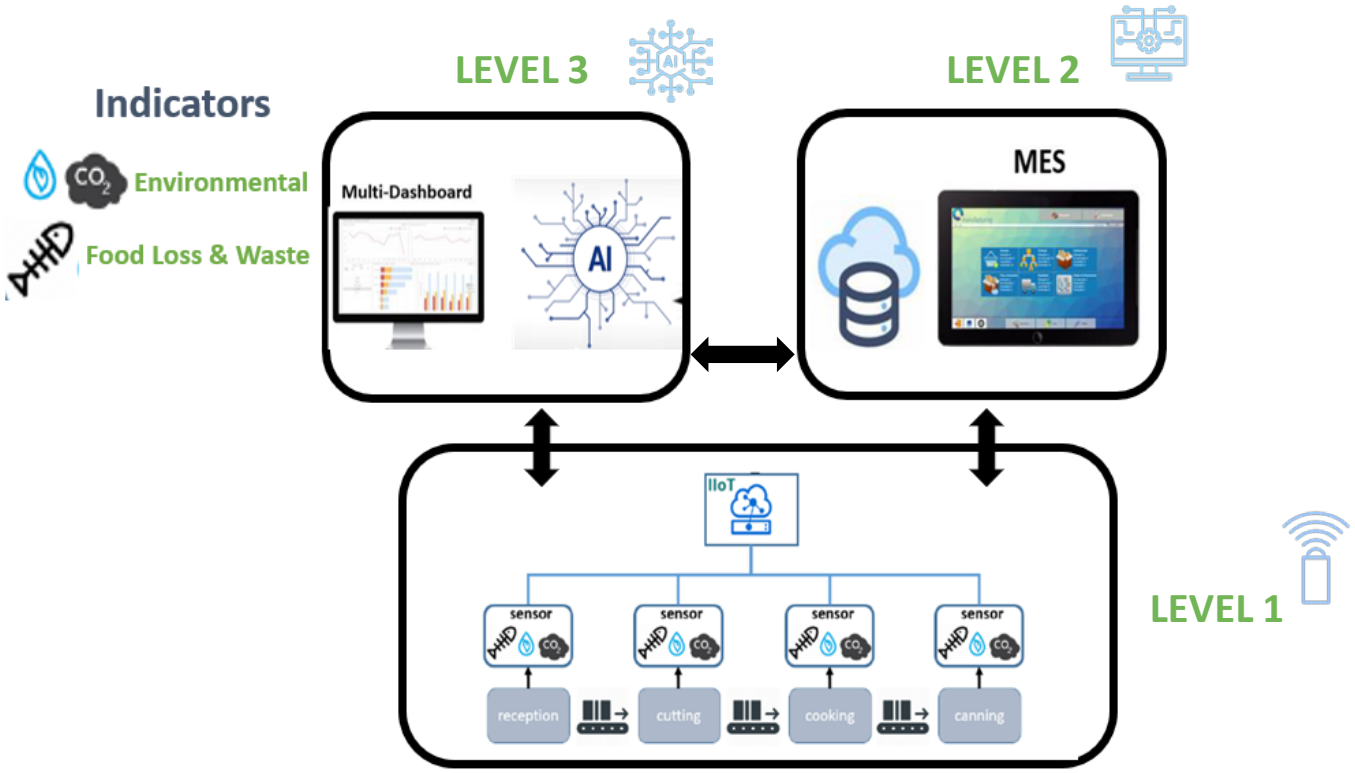
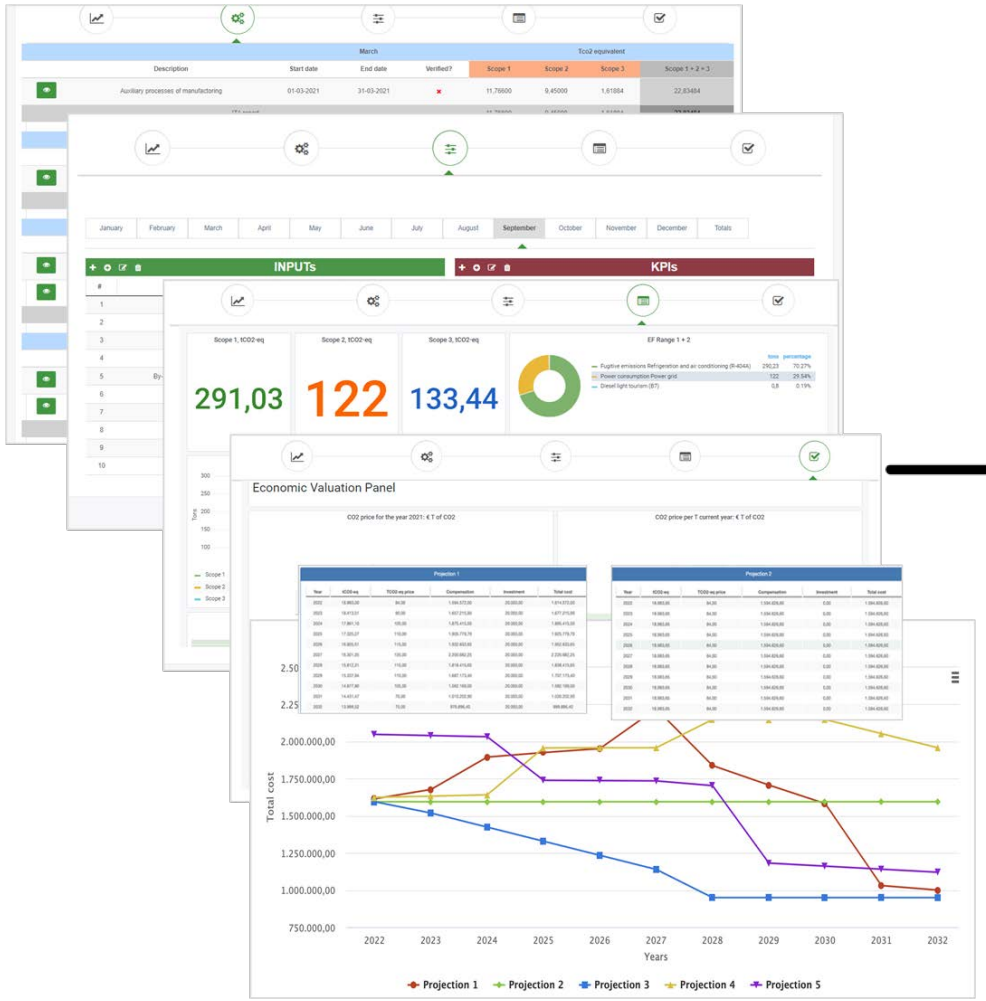
¿What is iFishCan?



IIoT digital cognitive platform for the optimization and prediction of process efficiency (waste, water, energy) in the canned fish industry.

- WEIGHT (Raw material, wastes & products)
- ENERGY Consumption
- WATER Consumption



OUTPUTS

- **Analyse and visualize production data**
- **Trace the use of resources** at each point of the production chain at **real-time:**
  - monitoring for efficient use of raw materials and reducing product waste
  - allowing to implement corrective actions in **real time**
- **Estimate the impact of the implementation of different technological solutions** on the efficiency and the associated **environmental footprint**

Testbed main goals:

10%
Reduction of food loss during production

5-10%
Reduction of energy consumption

5-20%
Reduction of water consumption

SUSTAINABLE DEVELOPMENT GOALS

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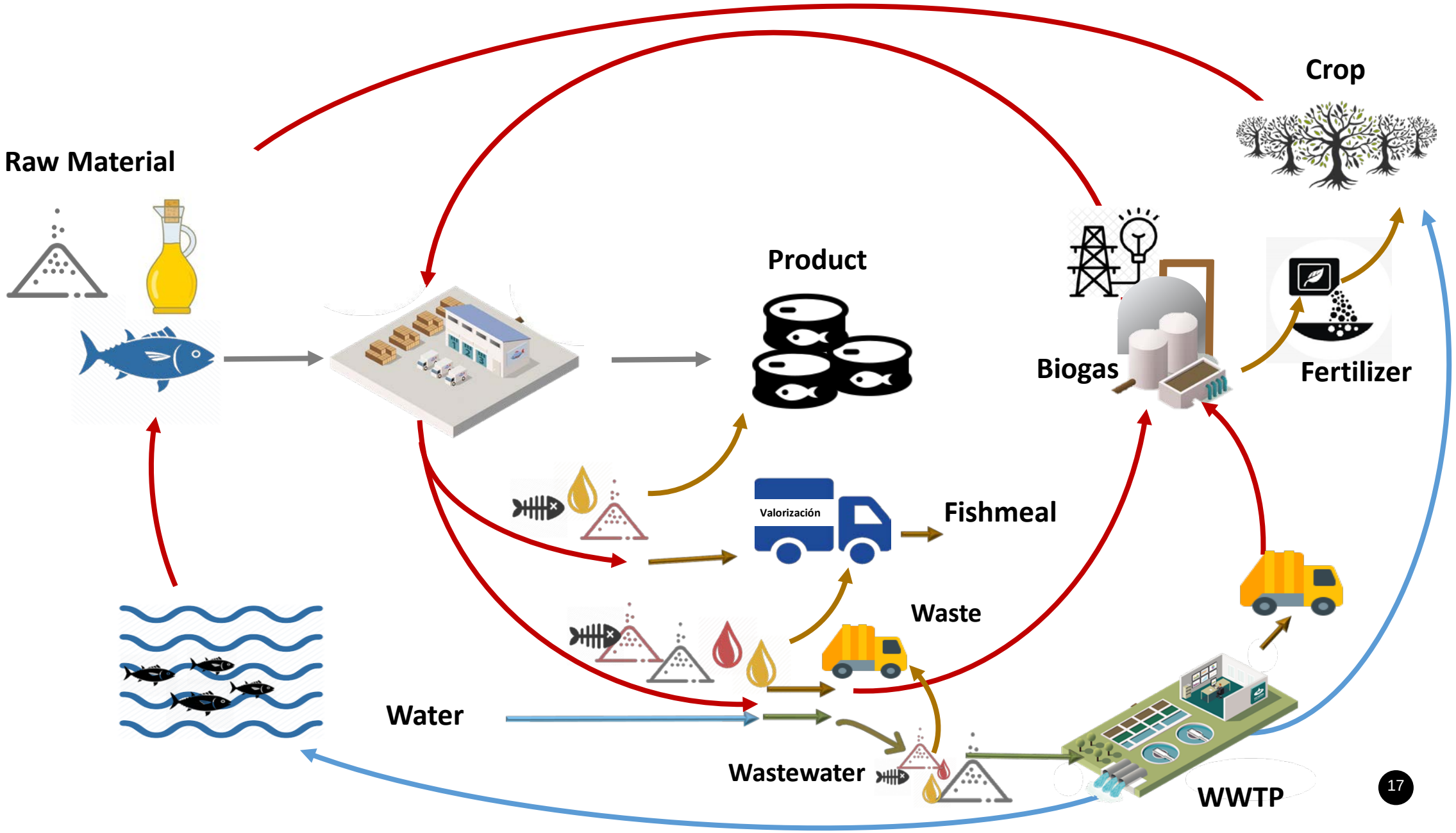
Fish Canning Industry and Circular Enonomy



Thank you very much for your attention

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