Overview on measurement efforts on solid waste management at the destination level by INSTO members

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MALLORCA

GENERAL DATA

- Island extension: 3.640 Km²
- Registered population: 940.471 inhabitants (2023)
- Population density: ≈ 260 inhabitants/Km²
- Municipal Waste Generation: 1,25 Kg/inhab/day

RELEVANT ASPECTS

- Demographic density: ≈ three times Spanish average
- Annual tourism: approx. 11 million visitors
- Economy based on the service sector, with a contribution of 80% to GDP, tourism being the most important economic sector > 50%.
- High seasonality in waste production
Evolución del Índice de Pressión Humana (IPH) en Mallorca
Gener 1997 - Març 2023
HPI vs waste generation

2019

2020

2021

2022
Global Waste Input
What is the scope of the concession?

- TIRME is a private company, concessionaire of the public service for the treatment of municipal and similar waste in Mallorca.

- The concession includes three activities:
  - Design
  - Construction
  - Operation and Maintenance

- The concessionaire is responsible for requesting all authorizations that are applicable in the three phases.

- The concession includes the management of the following wastes:
  - Municipal Waste (5 containers)
  - Sewage Sludge from Municipal Waste Water Treatment Plants
  - Refuse from treatment plants for Construction & Demolition Waste, bulky waste and end-of-life tires

- Shipment of municipal waste from the transfer stations to final treatment plants.

- Other aspects like: marketing of by-products generated in the waste management, public awareness, training and information initiatives.
Sewage-sludge composting plants

Transfer Stations

Disposal of refuse from C&D waste

LP Sorting Plant
Anaerobic Digestion
Indoor Composting

Solar drying plant for sewage sludge

Waste to Energy

Bottom ash treatment

Landfill for Non-hazardous waste

Emergency landfill
Integral Municipal Waste Management

✓ Our business strategy is focused on 'zero waste'

✓ We have incorporated the circular economy into our business strategy

Environmental goals

“Zero waste”

100% of Mallorca's waste recovered, materially or energetically

Target

Environmentally advanced, socially accepted and economically viable project

Our environmental management priorities

✓ Preserve the quality of the environment
✓ Protect biodiversity
CO$_2$e Emissions reduction through Waste Master Plans

NOTE: All the figures represented have been calculated based on estimates of waste generation from the fixed population registered in IBESTAT for the years 1990-1997 and the emission factors by current treatment.
Best Practices: CIRCULAR HOTELS, FINHAVA PROJECT
20. PLATFORM TO PROMOTE THE CIRCULAR ECONOMY, LOCAL FARMING AND SUSTAINABLE TOURISM

<table>
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<tr>
<th>ENTITY</th>
<th>TIRME</th>
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<tr>
<td>LOCATION</td>
<td>BALEARIC ISLANDS</td>
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<td>ACTIVITY</td>
<td>MALLORCA ENVIRONMENTAL TECHNOLOGY CENTRE</td>
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| BUSINESS MODEL | - Product as a service  
- Life extension  
- Reverse logistics  
- Resource recovery  
- Circular sourcing, green purchases  
- Collaboration between agents |
| $Rs$ | Reject/Thinks/Redesign/Replace/Relocate/Reduce/Reuse/Repair/Recycle/Restore/Regenerate |

**DESCRIPTION**

FINHAVA is a technology platform that traces the journey of food consumed in participating hotels, calculates its carbon footprint and reduction of greenhouse gases, measures the energy it produces, assesses the volume of food waste and transforms it into ecologic compost for farming.

Its initial members include different public and private entities: Consell de Mallorca, TIRME, MELIÁ HOTELES INTERNACIONAL, IBEROSTAR, RIU HOTELS & RESORTS, MAELOTT INTERNATIONAL, HOTELS VIVA, AGROMALLORCA, SON MARCH, ES MERCA, AGROMALLORCA, FRUITES HUGuet, ALAVerd, AGRICOLA DALMAU, REFRIOLOG, VOTTUN Y WDINA.

This is an example of collaboration where public administrations, hotels, farmers, waste managers and technology companies coordinated to close the production cycle and drive the circular economy in Mallorca. The origin of the raw materials is guaranteed throughout the process, sustainable, local and ecological farming is promoted, and the economic and environmental effects are measured.

FINHAVA offers traceability of the food cycle: hotels produce organic matter derived from consumption at their premises, which they then place in bins for weighing and treatment. The organic waste is then taken to TIRME’s premises to be transformed into ecologic compost identified with the customer’s details. Local farmers use the compost as fertiliser. Finally, the distributor buys the consumable products from the farmer for a weight equivalent to the organic waste created in the first step of the cycle. This inserts food back in the process, and closes the circular economy cycle.

**WEB**
http://finhava.com/
FINHAVA: Circularity of Bio-waste

- It traces the route of the foods consumed in member hotels
- It calculates the carbon footprint and the reduction of greenhouse gas emissions
- It produces compost for reuse in agriculture
- It assesses the amount of food waste generated
The food product is used in the menu that the hotel dining room/restaurant offers to guests and generates organic waste associated with consumption.

The Hotel carries out a selective collection of food waste through a sensorized bio-waste container that allows the weighing of the recovered fraction.

TIRME receives the residue and from the bio-waste generates organic compost and biogas.

The supply chain acquires the agri-food products and sells and distributes them to the hotels.

The organic compost is used in the crops for the fertilization of the agri-food product.
Solutions and services

- Solutions
  - Compliance
  - Sostenibilidad
  - Diferenciación

- Services
  - Accountability & reporting
  - Traceability
  - Certification
  - Transactionality

- Levers
  - KPIs
  - Certificates
  - Intangibles

Added Value
FINHAVA: Added value

1. The main value contribution of the platform consists of access to the purchase of **certified circular and local products**.

2. It allows to meet both **new regulatory requirements** and customer expectations in terms of circular economy and sustainability.

3. The tool helps to meet **ESG objectives** through certifications for hotels, such as "circular waste management" or CO\(_2\) emissions avoided.

4. The platform makes the hotel's sustainability **efforts visible** to customers in a **transparent and verifiable** manner.

5. The greater added value on the experience provided to the customer may materialize in a possible **increase in the price he/she would be willing to pay**.
FINHAVA: Storytelling

Awareness

Culture

Sustainable destinations

Preservation of the territory

Carbon Footprint

Origin and quality of products

Sustainable tourists

www.tirme.com
Data 2022

814 t Bio-waste

244 t compost

481 t circular products

177 MWh renewable energy

119 t de CO$_2$e saved
Information flow

Descarga de form

Cada día se vacían los contenedores de los huertos y se registra el peso de cada tonelada. El batán de salida es AAAAA/XX/NNNNNNN

donde NNNN es el número de colorador.

Hay que ingresar el cliente, la fecha y hora en el Step

Compost

de la herramienta de comercialización de compost se obtiene la venta y se identifica el Lote (correspondiente a un periodo entre dos fechas en una fecha determinada).

Será necesario obtener los lotes de turno entre fechas que serán los lotes de entrada al Step, el batán de salida será el de compost

Cuando se crea un nuevo lote se notifica a tirme para incorporar los datos de salida

Venta de compost
																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
también a partir de los datos de comercialización de compost se genera la venta de compost (siguiendo WordFlow) en este caso el batán de entrada será el lote de compost, el batán de salida será el de la venta a un agricultor AAAA

hay muchas ventas a partir del mismo lote

Recepción producto agrícola

El cliente final/receptor recibe el producto en su instalación y produce menu

Producción agrícola

El compost adquirido llega a una finca o varias. El agricultor especifica que finca ha sido usada y la fecha. De cada finca puedo sembrar y recoger diferentes lotes de productos que luego vendo al distribuidor o cliente

Huellas de CO2 total

Suma de las huellas del transporte del residuo, la producción del compost, el transporte hasta la finca, la producción agrícola y el transporte hasta al cliente final
Blockchain and IoT technology for sustainable development
Carbon Footprint \( \text{CO}_2 \text{eq} \)
THANK YOU FOR YOUR ATTENTION

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