Kafsimo: recycling coffee waste into bioenergy

Implementing a circular waste management system: a case study of spent coffee grounds

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InCommOn

Civil Non-Profit Company

Promotes participatory and sustainable urban development

Follows the principles of the circular economy

Designs and implements environmental, educational and social projects

Kafsimo: a pilot project

AIM. to model a scalable, low-emissions logistics system for organic waste management

HOW. using spent coffee grounds as a case study

AIM. to facilitate the transition to a circular economy

HOW. through shifting public perception on waste

WHERE. in Kilkis and Thessaloniki

WHEN. since 2019

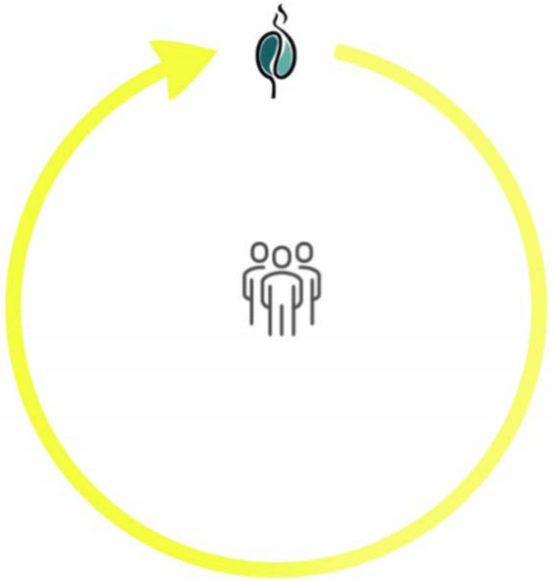
Kafsimo: a pilot project

_a circular economy, community-based project

_closing the cycle of coffee

from spent coffee grounds → to bioene

_holistic approach



Kafsimo: the processes

1. at-source separation by staff at a specially designed in-store collection bin

Kafsimo: the processes

2. collection of bins from the coffee shops with electric van, following a low-emissions route identified by a smart algorithm

Kafsimo: the processes

3. transportation to specially designed greenhouse in Kilkis for storage and natural dehydration in preparation for conversion into bioenergy

Kafsimo: the processes

4. three methods of conversion into bioenergy - pelletisation, direct incineration and biogas production

Kafsimo: the findings

Technical

_water content at 60%

_SCG contains 56.9% methane

_SCG works best as an additive to pellet composition

_suitable for biogas production

_theoretical gas yield per kg of dry matter is 0.49kg of biogas

Kafsimo: the findings

Environmental

_for every kg of SCG that kafsimo diverts from the landfill and is incinerated, up to 4.2 kilograms of CO_2eq emissions are saved

_overall, 60% less CO_2eq is emitted in this process as compared to the current alternative

_kafsimo will save up to 84 tons of CO_2eq (depending on utilisation method) in its first year of operation

_if all SCG in Greece → 169,552 tons of CO_2eq

Kafsimo: the findings

Social

_raising awareness and promoting behavioural change

_93% of the participating cafes report that separating coffee waste has become a habit

_kafsimo has reached around 22,000 people

_encourages participatory environmental “mentality change”, through the simple and relatable act of enjoying a cup of coffee

Kafsimo: the findings

Financial

_has created 3 new positions

_employs 9 people on a full- or part-time basis

_3 people from vulnerable groups have completed training on issues of circular economy and waste management → employable skills

_long-term impact: reduced municipal costs and charges

Kafsimo: the added value

_sustainable practices + participatory planning + social and economic benefits = innovative

_creating a local circular economy + shifting public perception on resource-consumption + highlighting the value of waste = holistic model

_community involvement + participatory planning & implementation = wide public acceptance

_smart system of logistics applicable to other areas and waste streams = scalable and replicable waste management

Kafsimo: conclusions

_a case study of a transition from a linear waste management system to a circular, community-based project

→ innovations associated can help drive Greece's transition to a circular economy

→ participatory nature of kafsimo, involving numerous stakeholders, drives compliance, behavioural change and involvement

→ innovations around low-emissions logistics → need for creating more sustainable logistics and not just focusing on the end product

Kafsimo: conclusions

_Managing SCG through the kafsimo method has positive environmental, social and financial impacts

_Monitoring long-term impacts in future stages → further conclusions as to how innovative waste management strategies can be scaled

_Multidimensional character demonstrates the potential for dealing with waste management in a holistic way giving the necessary importance to all the parts that make up a life cycle

THANK YOU

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από υπολείμματα καφέ

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