



Recycaps

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Challenge



Challenge TEAM i_1

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How a proper eco design strategy could induce consumers to be actively part of the packaging waste management?

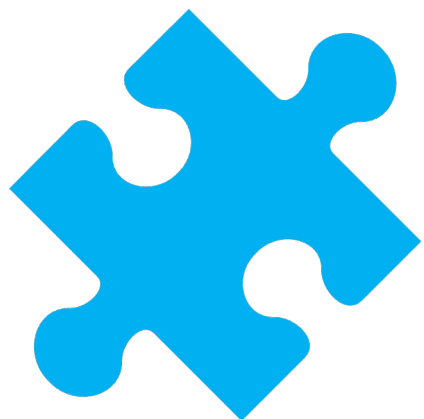
Challenge Motivation

Consumers deserve to know more about how they can unlock hidden value for themselves, and for the environment. Our policies will help consumers identify and access more sustainable products characterized by a specific packaging. Consumers should be helped in the management of packaging end-of-life. Thus, there is the need for a proper packaging design, although in the case of multimaterial packaging, which allows to easily separate the materials and to properly dispose of them.

Expected outcomes

Improve a multi material packaging characterized by a clear distinction of the materials used also having parts produced by different technologies, such as:

- Multi-material cap or dispenser (moulded by injection) + bottle
- Chocolate box having 3 level of packaging (primary, secondary and tertiary) propose a solution more environmental friendly able to "speak to the customer"



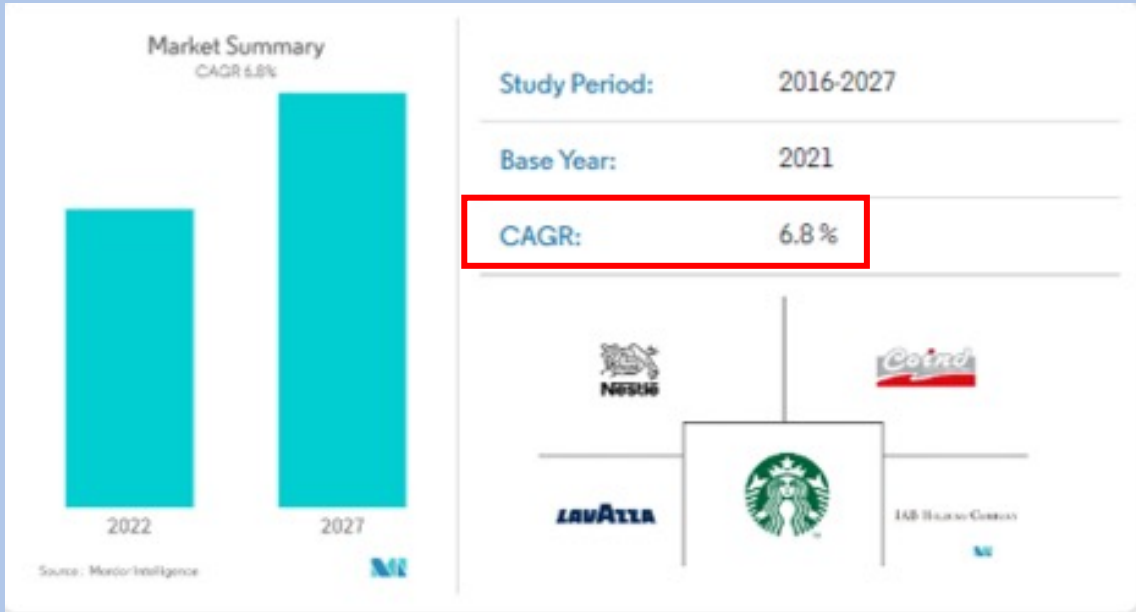
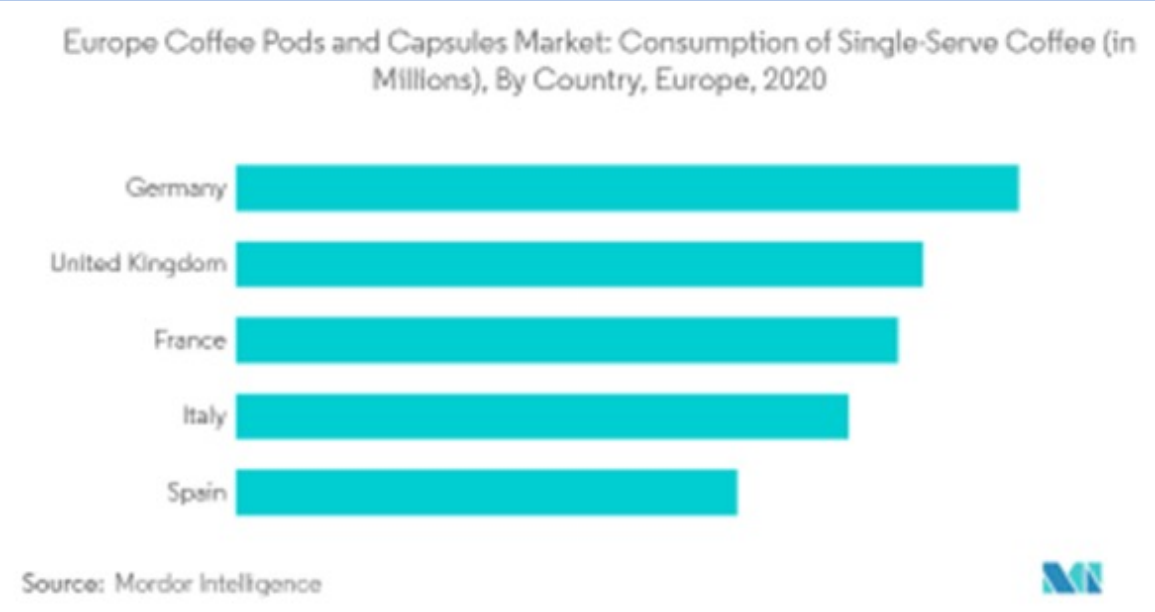
Coffee is a pleasure...



- Ground-breaking commercial idea
- Espresso Italian style-Nespresso 1986
- User friendly
- Several different flavours
- Huge development all over the world



Capsule consumption is high and bound to increase in the next years



COFFEE CAPSULES: SOME DATA

EVERY YEAR **10 BILLIONS OF CAPSULES** ARE GLOBALLY SOLD

120.000 TONS OF WASTE ARE GENERATED

NEW RESEARCH FOUND **29,000 DISCARDED COFFEE** PODS END UP IN **LANDFILLS EVERY MONTH** (NEARLY **350,000** A YEAR) WHERE THEY WON'T BREAK DOWN FOR AT LEAST **500 YEARS**.

EACH CAPSULE **CONTAINS 6/7 g OF COFFEE** AND RELEASES IN THE ENVIRONMENT **3 g OF PLASTICS/ALLUMINUM** BASED MATERIALS.



Coffee capsules: the challenges



- **Overpackaging**

Primary pack (the capsule)

Secondary pack (the flowpack)

Tertiary pack (the carton box)

- **Recycling issues**

A mix of different materials combined with organic residues of coffee, makes the capsules impossible to be processed in a standard municipal recycling plant.

- **Lack of consumer engagement**

No chance of a proper recyclability approach, which leads to the mismanagement of the capsules after use



Existing solutions

- **Recycle lead by Nespresso?**

Consumer is generally lazy and not motivated

→ **NEED OF INCENTIVES**

- **Compostable capsules?**

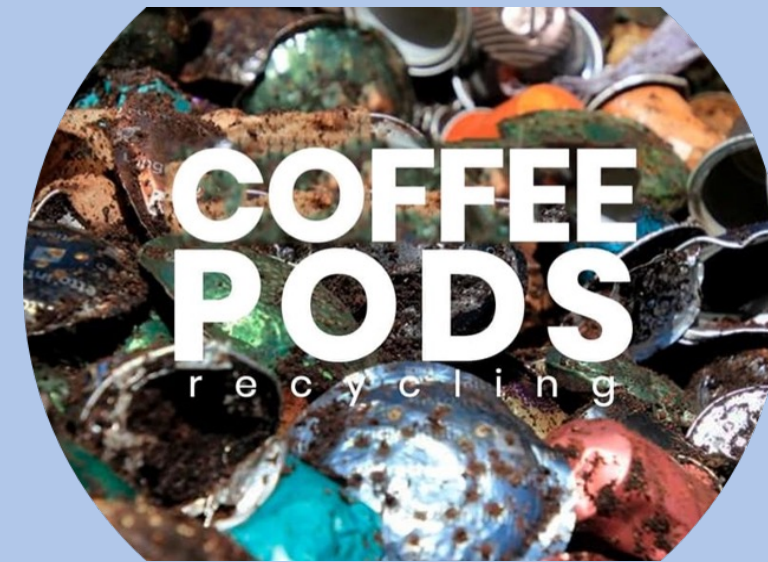
Not accepted by all European Countries

In Italy (according to ISPRA) the 63% of the organic fraction is sent out to facilities, but those plants often have troubles in processing compostable plastics.

→ **NEED TO FIND SUITABLE RECYCLABLE MATERIALS**

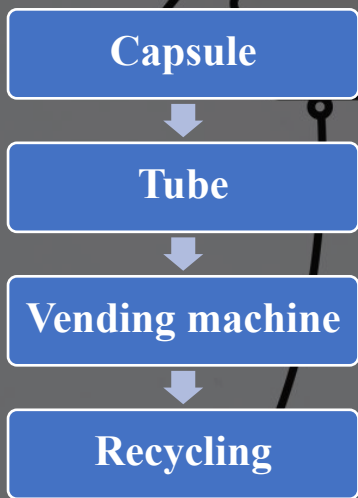
- **Reusable/refillable capsules?**

Uncomfortable use





Our project: putting the idea into practice



KEY TOPICS

- **The capsule – Product protection**

To keep a PP based capsules with a thin layer of EVOH

It **guarantees recyclability** but still **preserves aroma** and product shelf life

- **The Tube – No overpackaging**

To remove the secondary and tertiary packaging (flowpack + carton box)

To study a reusable **tube in rigid PP** giving high water vapour barrier against humidity, provided with a unique and interactive **bar code**.

- **The Vending machine – Interaction**

It sell capsules suitable for different coffee machines

It reads the bar code of the tube and **“interacts”** with the consumer

Engagement is boosted by an **incentives program** (capsules for free at specific target of returned capsules)

- **The Recycling system – Circular Economy**

Vending machine equipped with a system for a preliminary separation of organic and plastic material then collected by selected recycling companies

Full application of the principles of the **circular economy**



**ECO-DESIGN, INCENTIVES AND
RECYCLING STRATEGY STRIKES
THE CONSUMER**

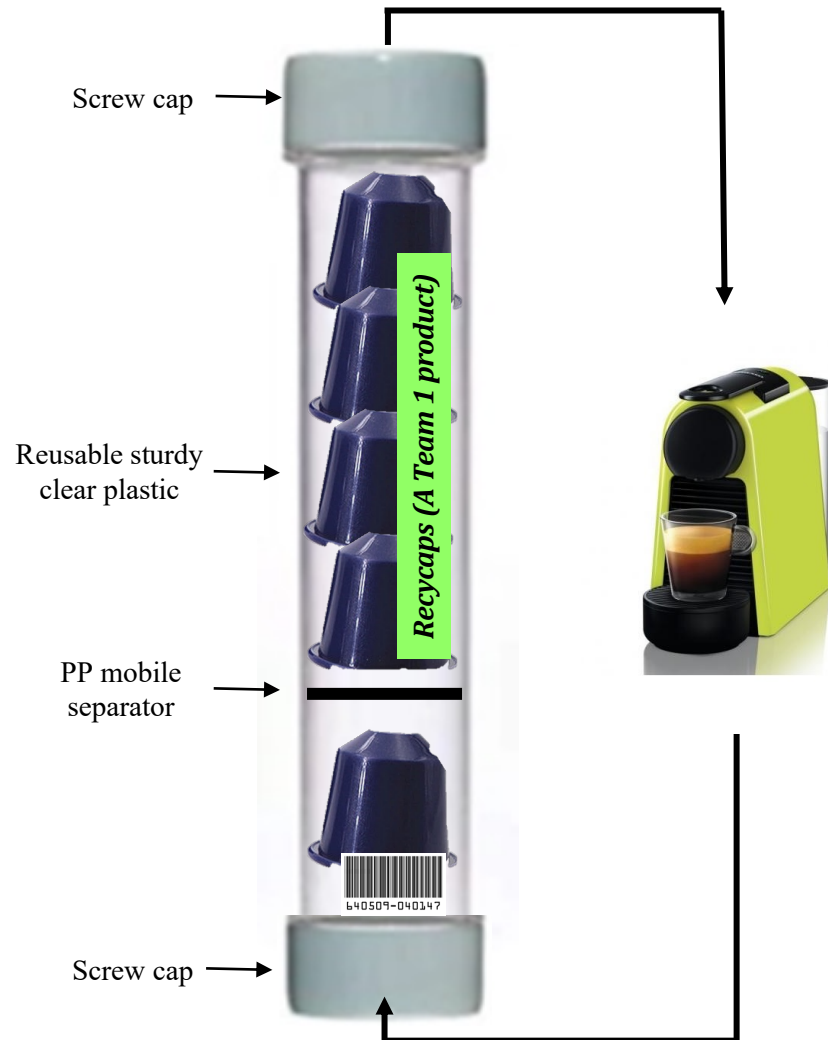
Prototype: the capsule



- Thin wall of rigid PP (injection moulding)
- Thin layer of evoh (co-injected)
- Lid film in Flexible PP (with AlOx deposition)
- Material suitable for the recycling PP stream

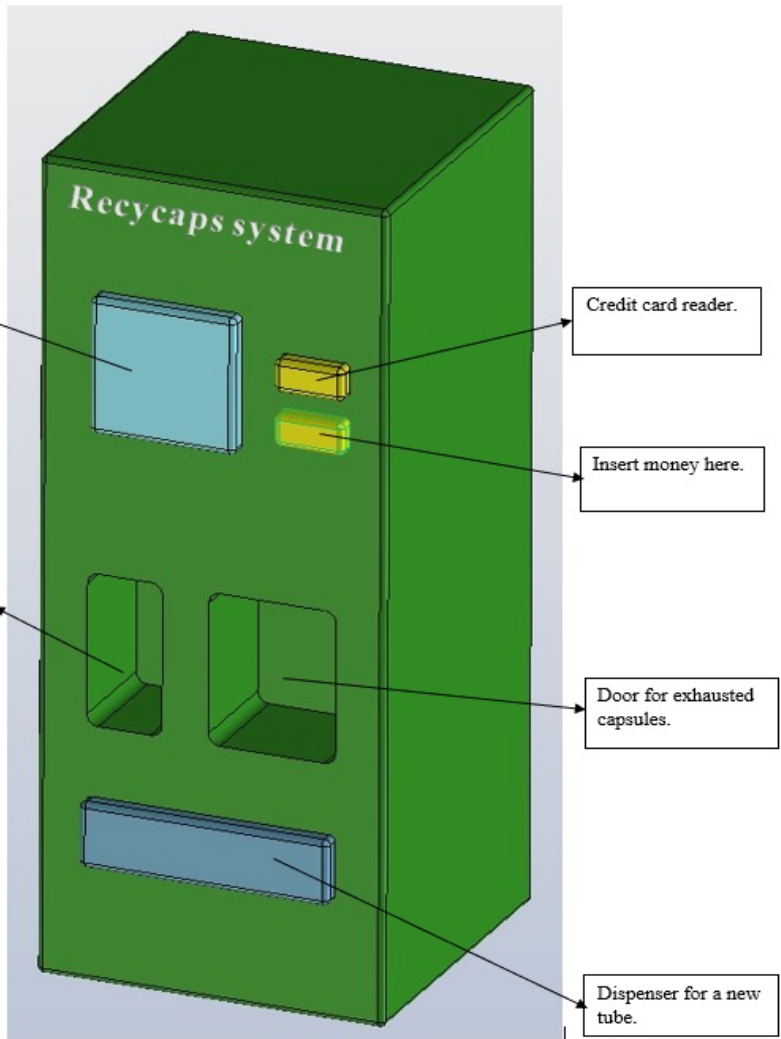


Prototype: the convenient tube



- **See-it-through tube in rigid PP** : consumer check the amount of capsules left (tube can be opened on both sides through screw caps).
- **A plastic mobile separator creates two different zones** in the tube (upper for new capsules and lower for used ones), **no contamination**.
- **Bar code system** – Interaction machine/consumer **Plastic producers take advantage** of not producing a plastic bag for each capsule: less consumption and fewer fees for contamination.
- Additional labels made out of solubled **water-based ink/adhesives with a non-dark colour** to maximise recyclability (according to Ceflex guidelines).
- The consumer does not have to sort the waste, but has just to **put the pod back in the tube** (reducing the inconvenience of throwing the product away).

Prototype: the vending machine



Vending machine installed in selected stores and supermarkets



It provides capsules of different brands and flavours, compatible with the tube and “recyclable ready” (Rigid PP)



It provides new tubes, capsules and collects the used ones.



It reads the bar code and collects «coffee points» for every tube recharge: every 5 recharges the consumer gets 10 capsules for free **(ECONOMICAL INCENTIVE for CONSUMERS).**



The display provides commercial and sustainability information (n° of capsules collected – CO2 saved) **(CONSUMER EDUCATION ON SUSTAINABILITY).**

Prototype: the recycling system

ORGANIC MATTER AND CAPSULE SEPARATION

- **OPTION 1** Consumers can separate the organic matter and put it in the organic bin, putting back the capsule in the tube.
- **OPTION 2** The dispenser is equipped with an internal mechanism which separates capsules and collects organic matter.

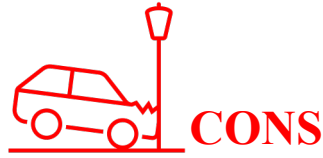


Given the small dimensions of capsules, to ensure their recycle, the dispenser has an internal mechanism which allows their accumulation into bigger PP bags *

EXHAUSTED CAPSULES COLLECTION

- **OPTION 1** Operators of the recycling facility collect the bags.
- **OPTION 2** Stores/supermarkets collect and bring the bags to the recycling plant

*According to CONAI's directive of 7/10/2014, capsules are not recyclable alone.



- A strong consumer engagement is needed since the beginning.
- Plastic producers find this solution non-profitable.
- Supermarkets and shops might not want to invest money for buying a brand-new and complex machine



- It is an eco-friendly solution which tackles the problem of the unrecyclability of capsules.
- Concepts of eco-design and sustainability apply.
- Companies have less costs for raw material consumption and waste management.
- Recycling facilities take advantage of a product already being sorted out from the rest of the waste.
- Consumers are involved directly in the process: they play active part and are engaged in the development of circular economy.
- Consumers are drawn to the system thanks to an economical profit.



A proper eco-design strategy tackles the problem of poor interest of consumers, who still can enjoy the commodity of coffee capsules and helps every stakeholder taking advantage in the process



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