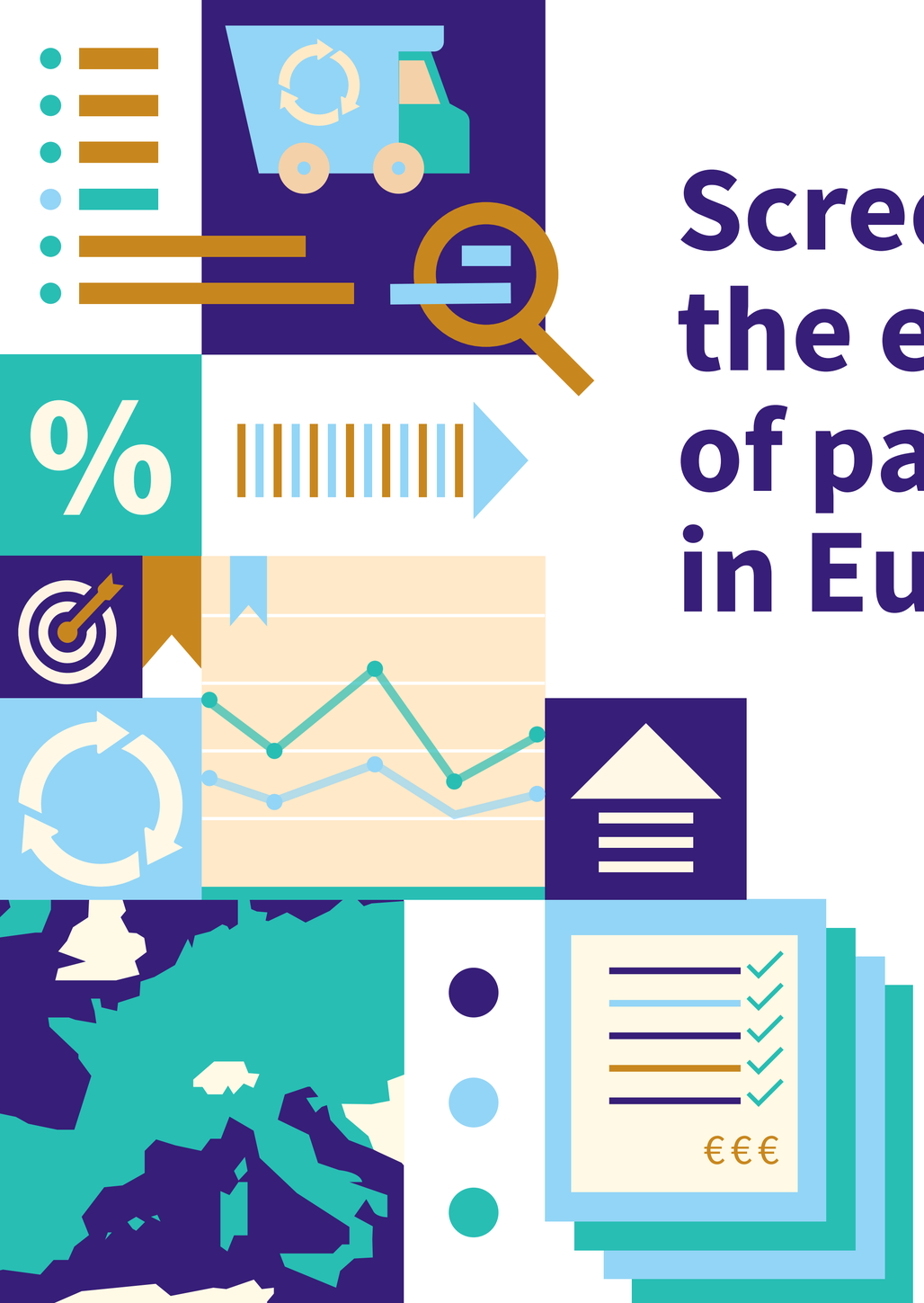


Screening the efficiency of packaging EPR in Europe

Bocconi University study commissioned by CONAI

CONAI

FROM THE PRINCIPLE OF SHARED RESPONSIBILITY TO THE EXTENDED PRODUCER RESPONSIBILITY

1994 — 2018

DIRECTIVE 94/62/EC
ON PACKAGING AND PACKAGING WASTE

Principle of OPERATORS SHARED RESPONSIBILITY

Dealing ONLY with packaging's END OF LIFE

REVISION OF THE DIRECTIVE 94/62/EC
ON PACKAGING AND PACKAGING WASTE
(2018/852/CE)

EXTENDED PRODUCER RESPONSABILITY Principle (EPR)

Dealing the packaging
FROM THE DESIGN TO THE END OF LIFE

Definition from the EU study by Deloitte (2014)

DEVELOPMENT OF GUIDANCE ON EXTENDED PRODUCER RESPONSIBILITY (EPR)

Polluter Pays Principle (PPP)
The polluter-pays principle is a guiding principle at European and international levels, which stipulates that the waste producer and the waste holder should bear the costs of waste management in a way that guarantees a high level of protection of the environment and human health.

EPR (Extended producer responsibility)
An environmental policy approach in which a producer's responsibility for a product is extended to the post-consumer stage of a product's life cycle (OECD definition).
In EU the Member States and their respective legislation are responsible for the implementation of EPR, including regulating the operational aspects of EPR.

EPR scheme or EPR compliance scheme
Any system or scheme set up by one or several producers to implement the EPR principle.

PRO (Producer Responsibility Organisation)
A collective entity set up by producers or through legislation, which becomes responsible for meeting the recovery and recycling obligations of the individual producers.

Eco-design
Any production process that takes into account environmental considerations (e.g. raw material use, recyclability, end-of-life waste management requirements) at the product design stage.

DEFINITIONS WITH THE DIRECTIVE EU 2018/851

EPR (Extended Producer Responsibility)
The definition of 'extended producer responsibility' refers to a series of measures, adopted by the Member States, aimed at ensuring that product manufacturers have financial or financial and operational responsibility in managing the life cycle of a product, including operations like separate collection, sorting and treatment. This obligation may also include organizational responsibility and a contribution to the prevention of waste and the reusability and recyclability of products.

EPR Scheme
Extended producer responsibility scheme means a set of measures taken by Member States to ensure that producers of products bear financial responsibility or financial and organisational responsibility for the management of the waste stage of a product's life cycle.

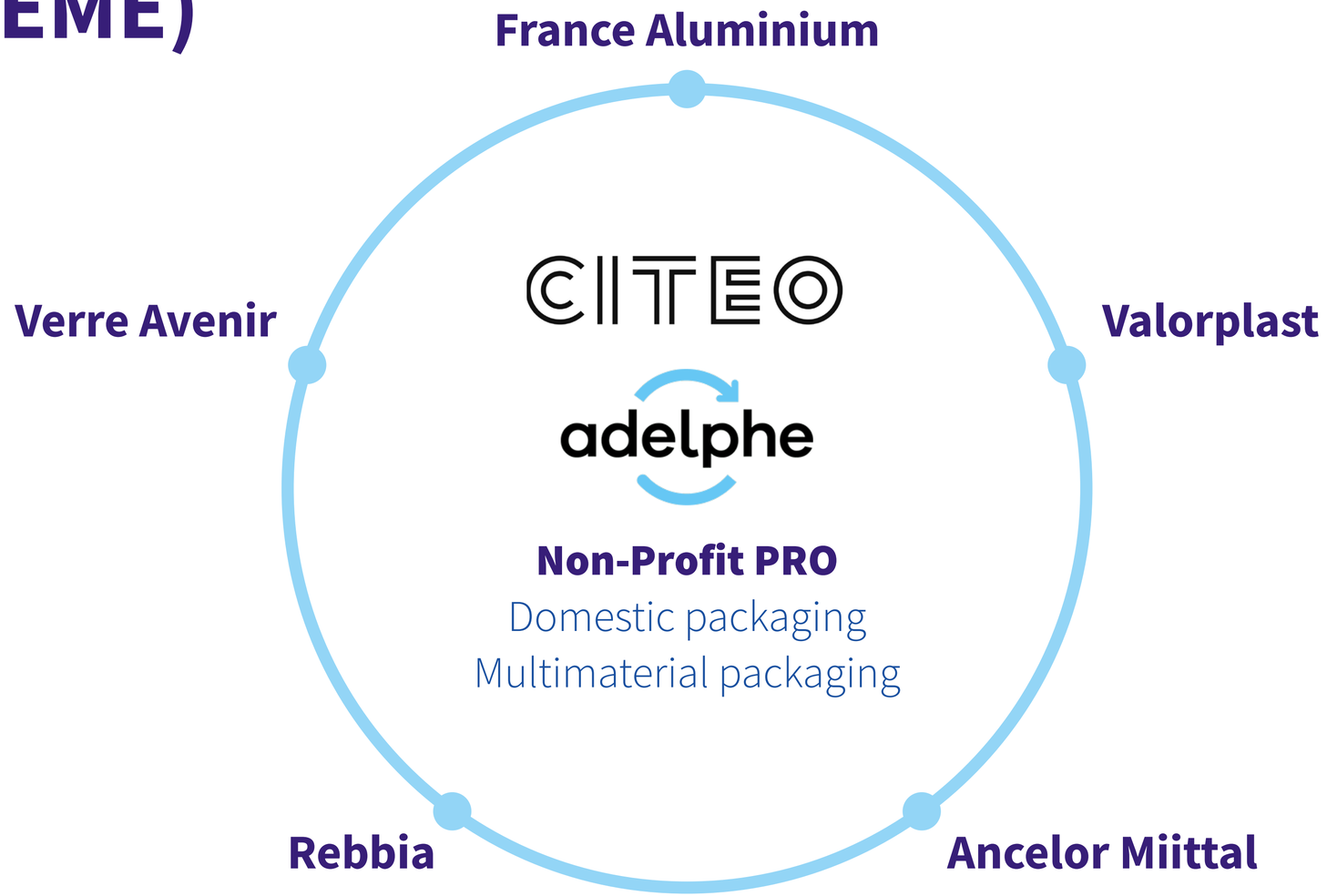
PRO (Producer Responsibility Organisation)
Organisations implementing extended producer responsibility obligations on behalf of producers of product.

Prevention
Measures taken before a substance, material or product has become waste, that reduce:
- the quantity of waste, including through the re-use of products or the extension of the life span of products;

- the adverse impacts of the generated waste on the environment and human health;
or
- the content of harmful substances in materials and products.

CITEO (PRO) IN FRANCE (EPR SCHEME)

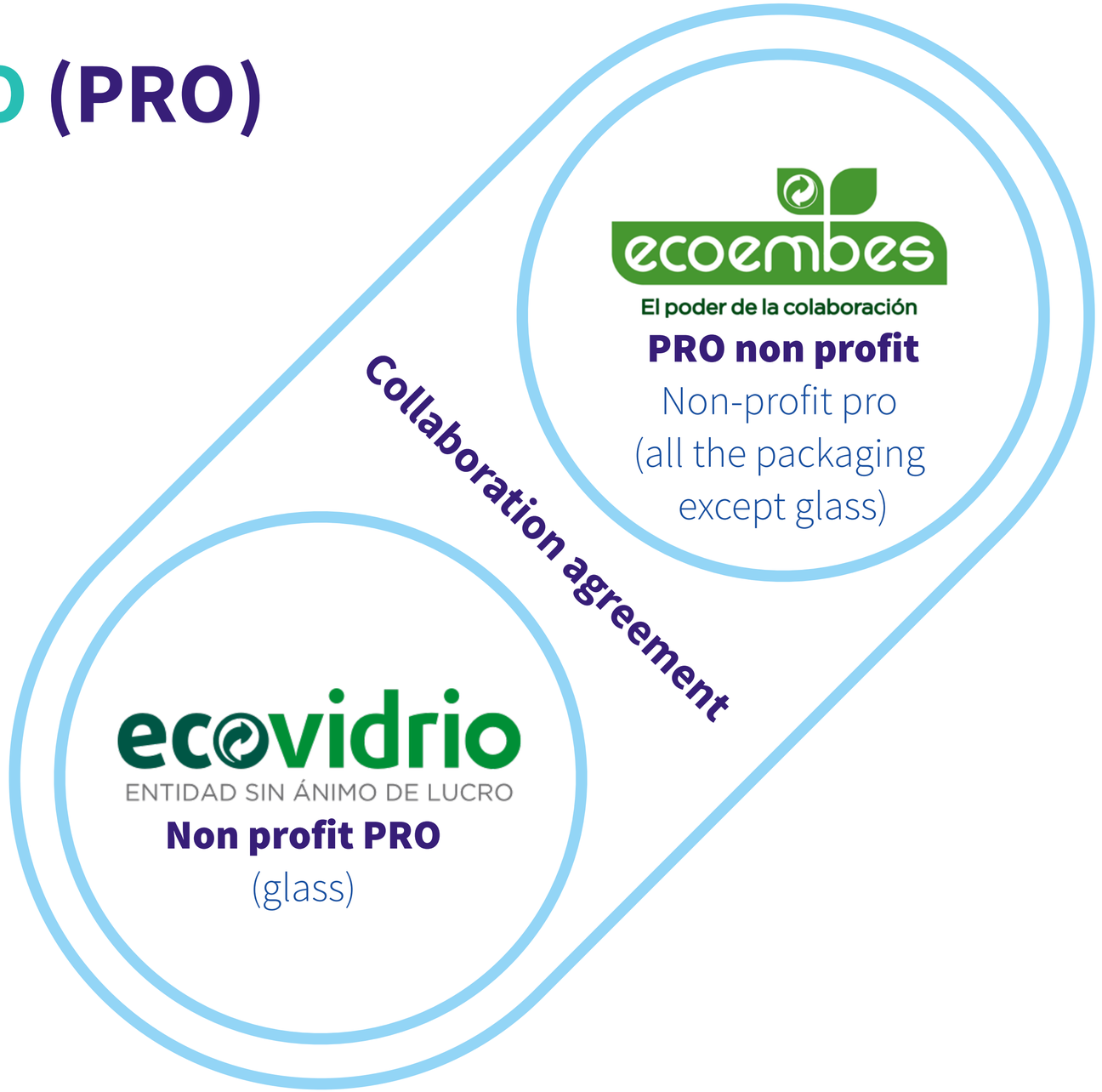
Example of a **SINGLE PRO*** in a **NON-COMPETITIVE EPR SCHEME**.



***Single PRO: a PRO that holds more than 90% of the share of a non-competitive EPR scheme.**

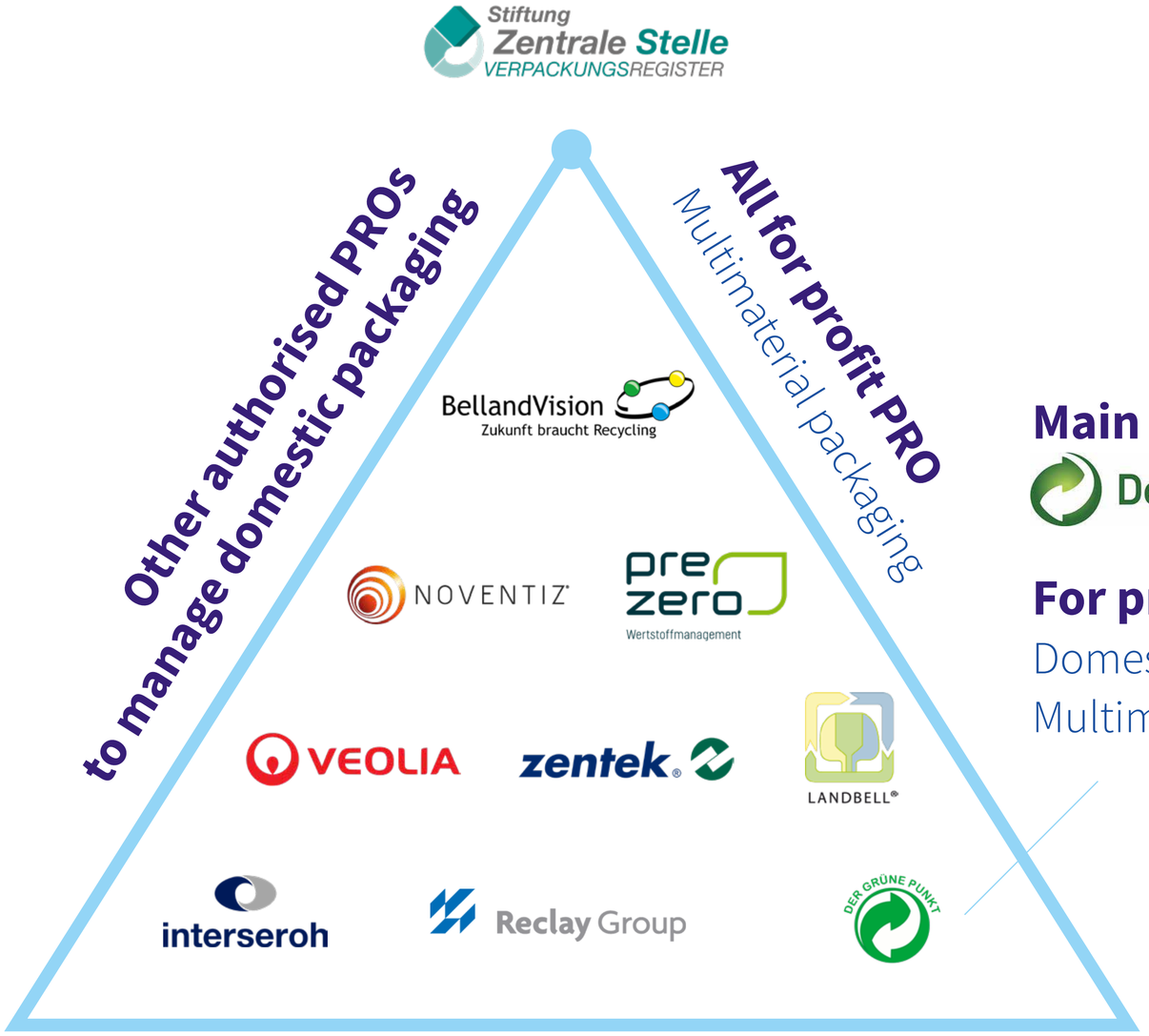
ECOEMBES & ECOVIDRIO (PRO) IN SPAIN (EPR SCHEME)

Example of **MULTIPLE PRO** in a **NON-COMPETITIVE EPR SCHEME**.



PRO IN GERMANY (EPR SCHEME)

Example of **MULTIPLE PRO** in a **COMPETITIVE EPR SCHEME**.



Main PRO

DerGrünePunkt

For profit PRO

Domestic packaging
Multimaterial packaging

FIRST RESEARCH

Different packaging waste management models were born in Europe over the years.

The present research aims at assessing their **performance** in terms of:

- **ECONOMIC EFFICIENCY**
- **RECYCLING EFFECTIVENESS**

In order to identify the positioning of **CONAI**, especially in the purpose of the ongoing national and European regulatory implementation.

First research on assessment study of the topic, commissioned by:

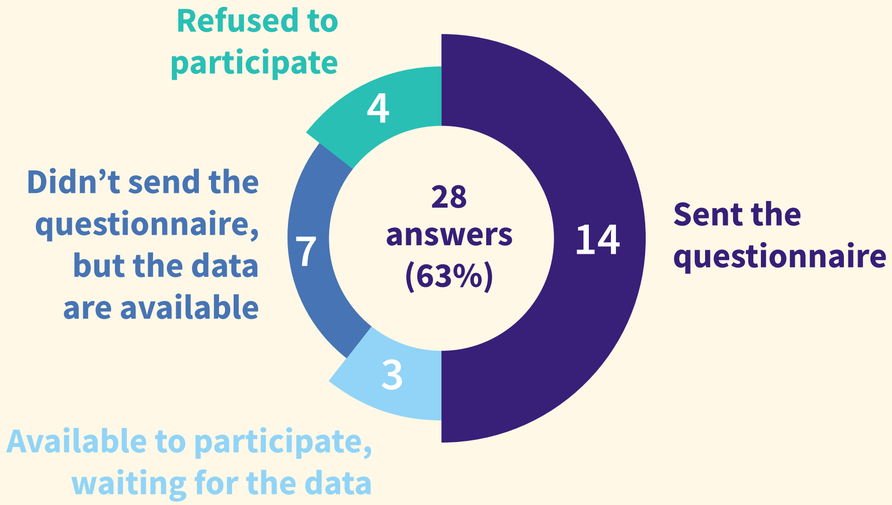
Università Bocconi
GREEN
Centre for Geography, Resources, Environment, Energy and Networks

Wuppertal Institut
für Klima, Umwelt, Energie GmbH

LIMITED TRANSPARENCY

CONAI

28 EUROPEAN PROs
OUT OF 44 CONTACTED CONTRIBUTED TO THE SURVEY.



Some of them, because of privacy and competition issues, have preferred not to share their operational and financial results.

CONAI is one of the few PROs that have shared all the **detailed information** through **public reports**.

PROs ASSESSMENT

KEY PERFORMANCE INDICATORS

ASSESSING
COSTS AND RECYCLE

RECYCLING RATE

Q.OF RECYCLED MATERIAL

Q. OF MATERIAL PUT ON MARKET

COSTS

€ x PUT-ON-MARKET PACKAGING IN TONNES

RECYCLED PACKAGING IN TONNES

2 KPIs

PRO

RECYCLING RATE

RECYCLING EFFECTIVENESS

1 = MORE RECYCLING

0 = LESS RECYCLING

COSTS

ECONOMIC EFFICIENCY

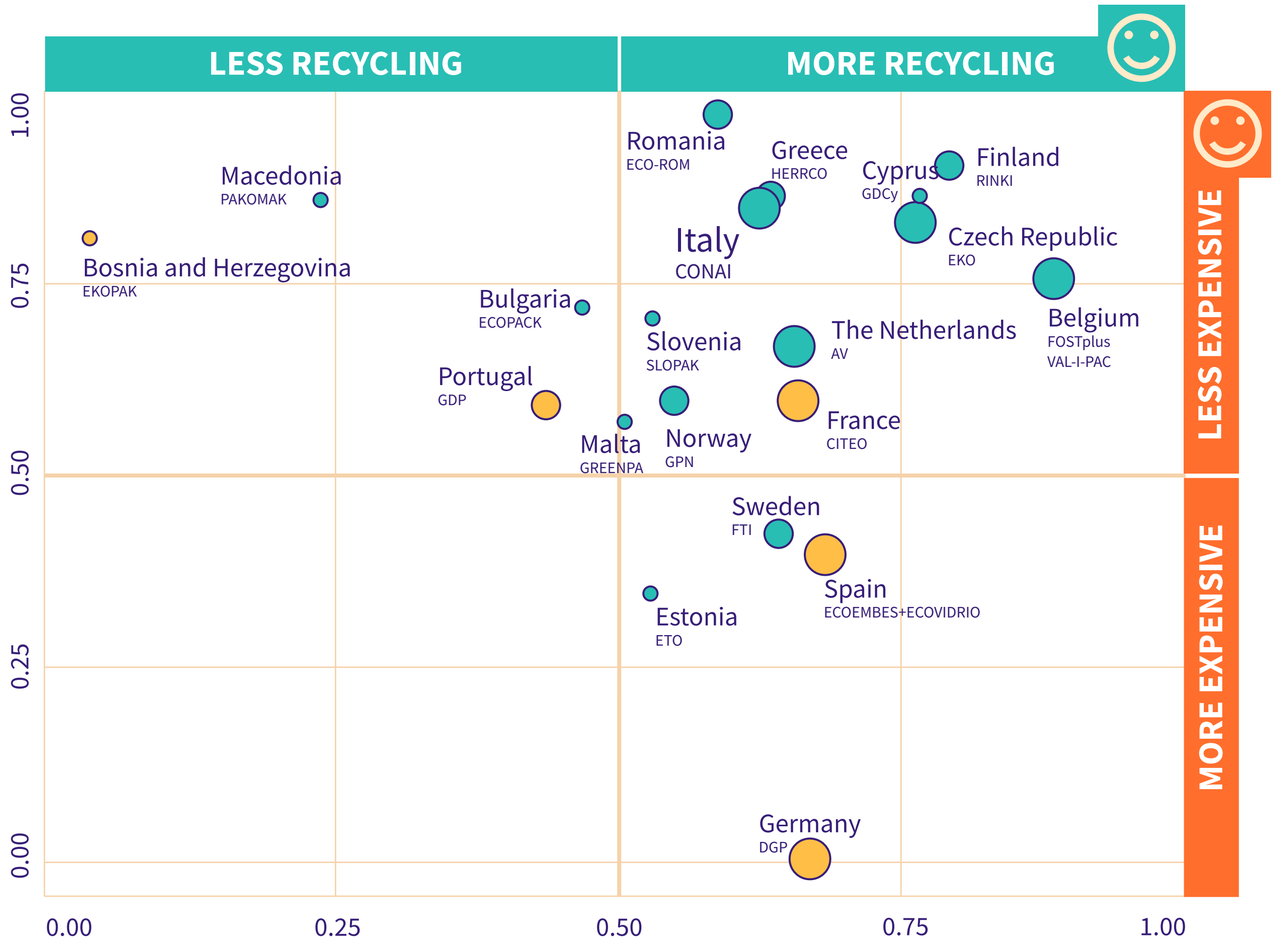
1 = LESS EXPENSIVE

0 = MORE EXPENSIVE

ANALYSIS and RESULTS

PROs' DIMENSIONS ARE INDEPENDENT IN RESPECT OF THEIR EFFICIENCY AND EFFECTIVENESS

CONAI is **efficient** and **effective**.



LEGEND:

According to number inhabitant served:

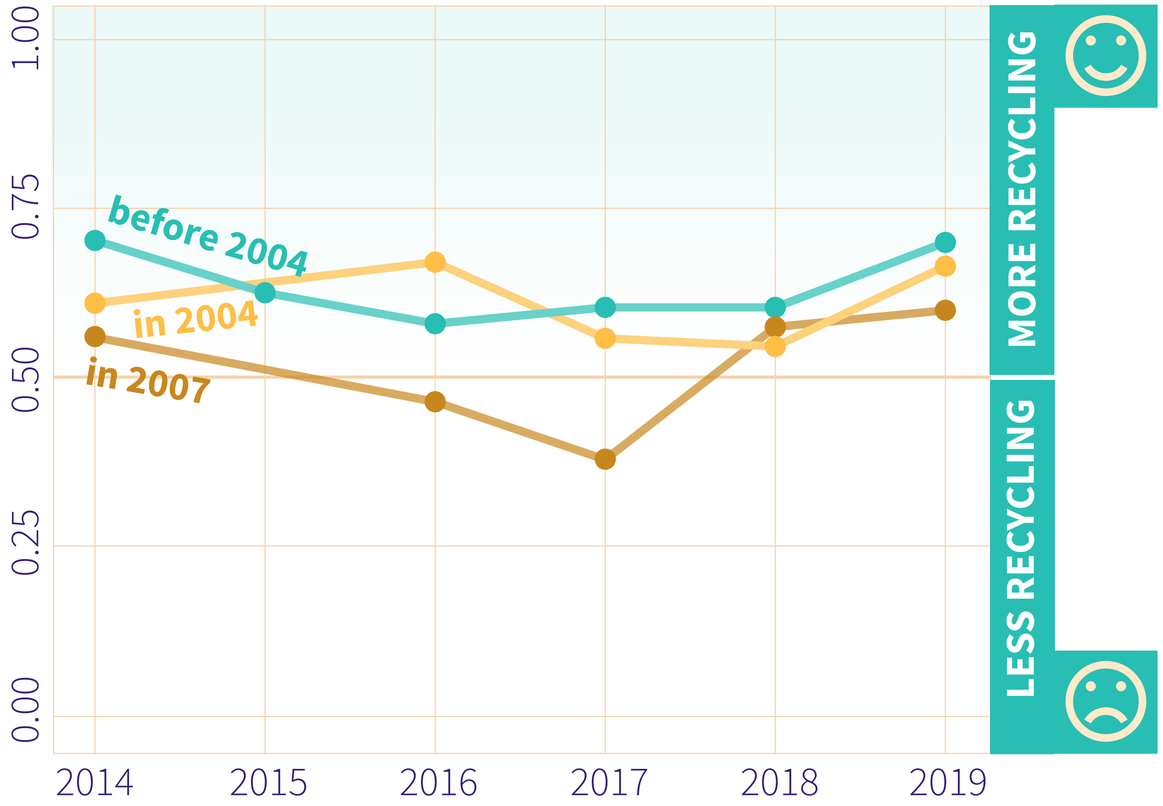
small PRO **medium PRO** **big PRO**

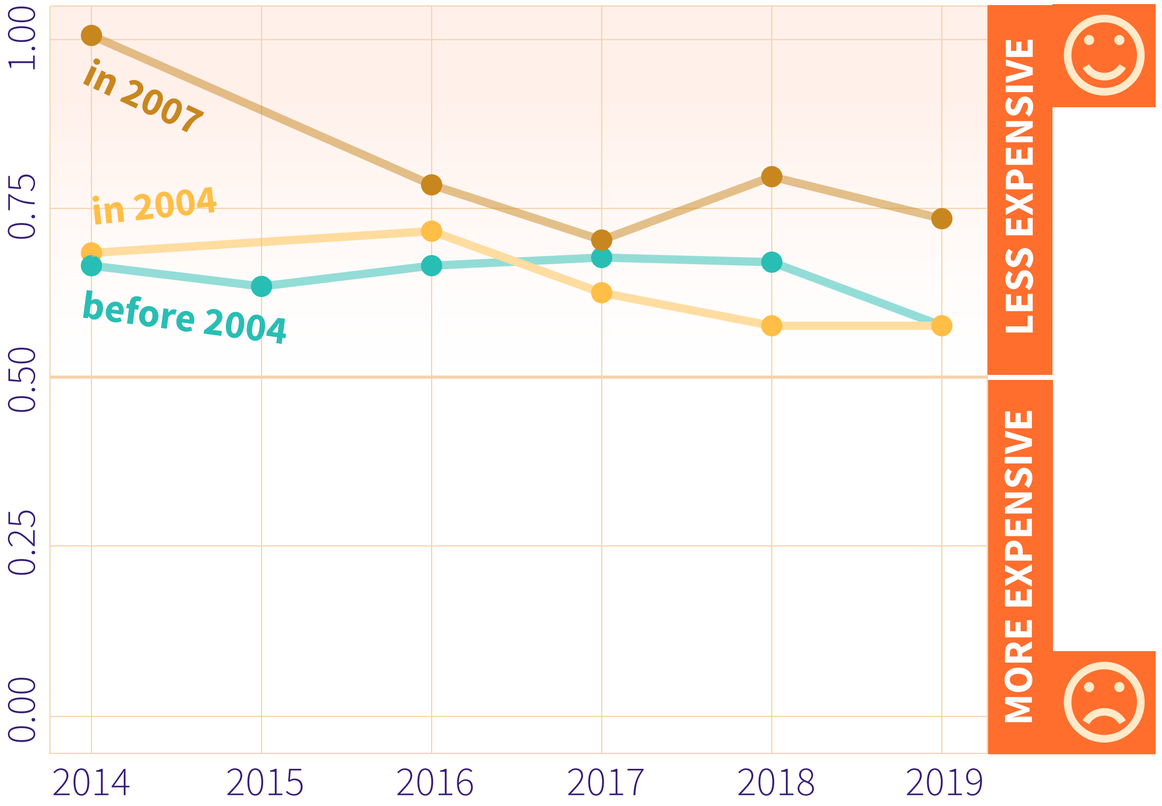
Depending on packaging waste stream under remit:

households **commercial & industrial** **all packaging**

CONSOLIDATED PROs ARE MORE EFFECTIVE, NEW PROs ARE MORE EFFICIENT

Countries in UE

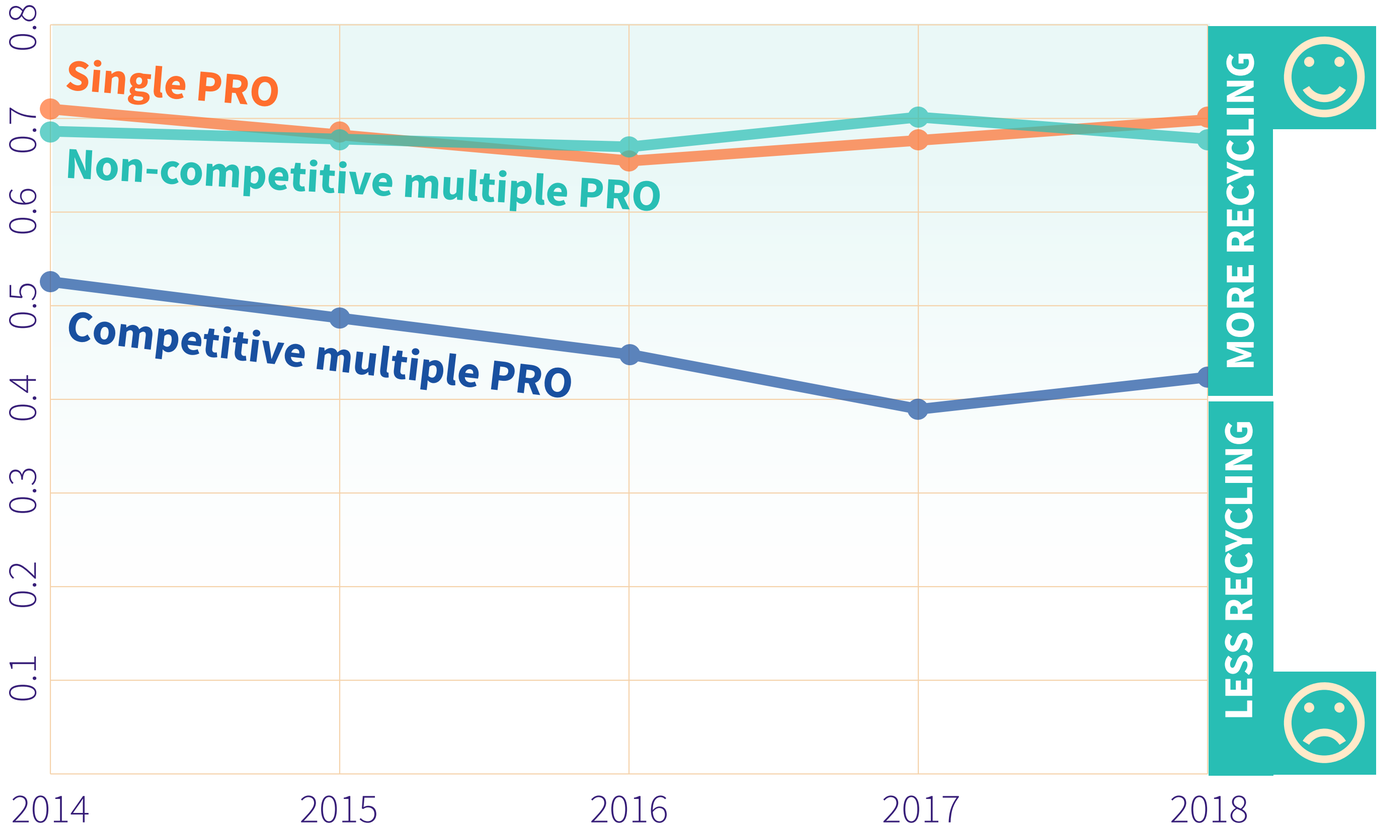




SINGLE PROs IN A NON-COMPETITIVE EPR SCHEME ARE MORE EFFECTIVE OVER TIME

RECYCLING EFFECTIVENESS
over 5 years.

Average comparison of
SINGLE*/ MULTIPLE PROs
operating in
COMPETITIVE/ NON COMPETITIVE EPR schemes.



***Single PRO: a PRO that holds more than 90% of the share of a non-competitive EPR scheme.**

SINGLE PROs IN A NON-COMPETITIVE EPR SCHEME ARE MORE EFFICIENT OVER TIME

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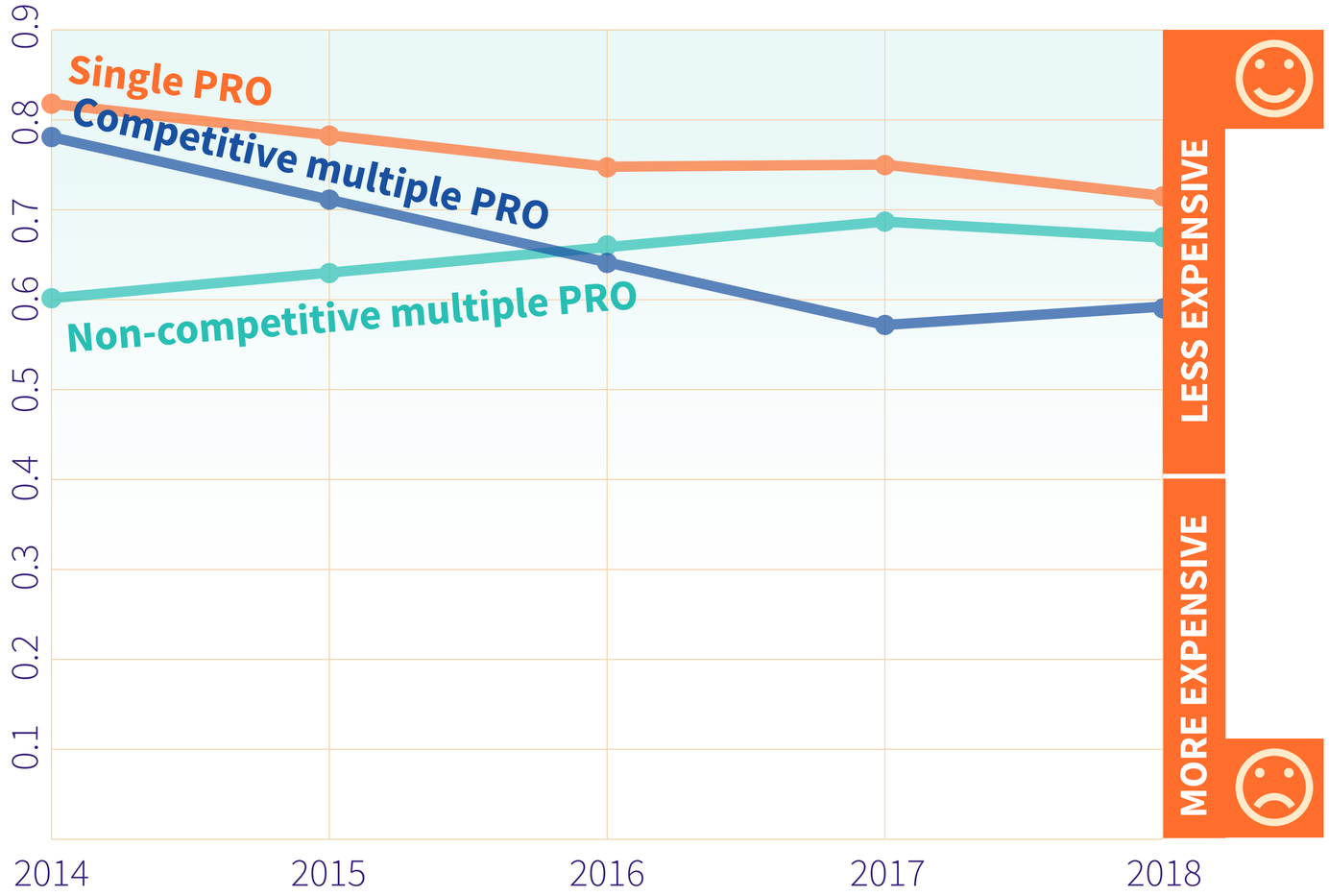
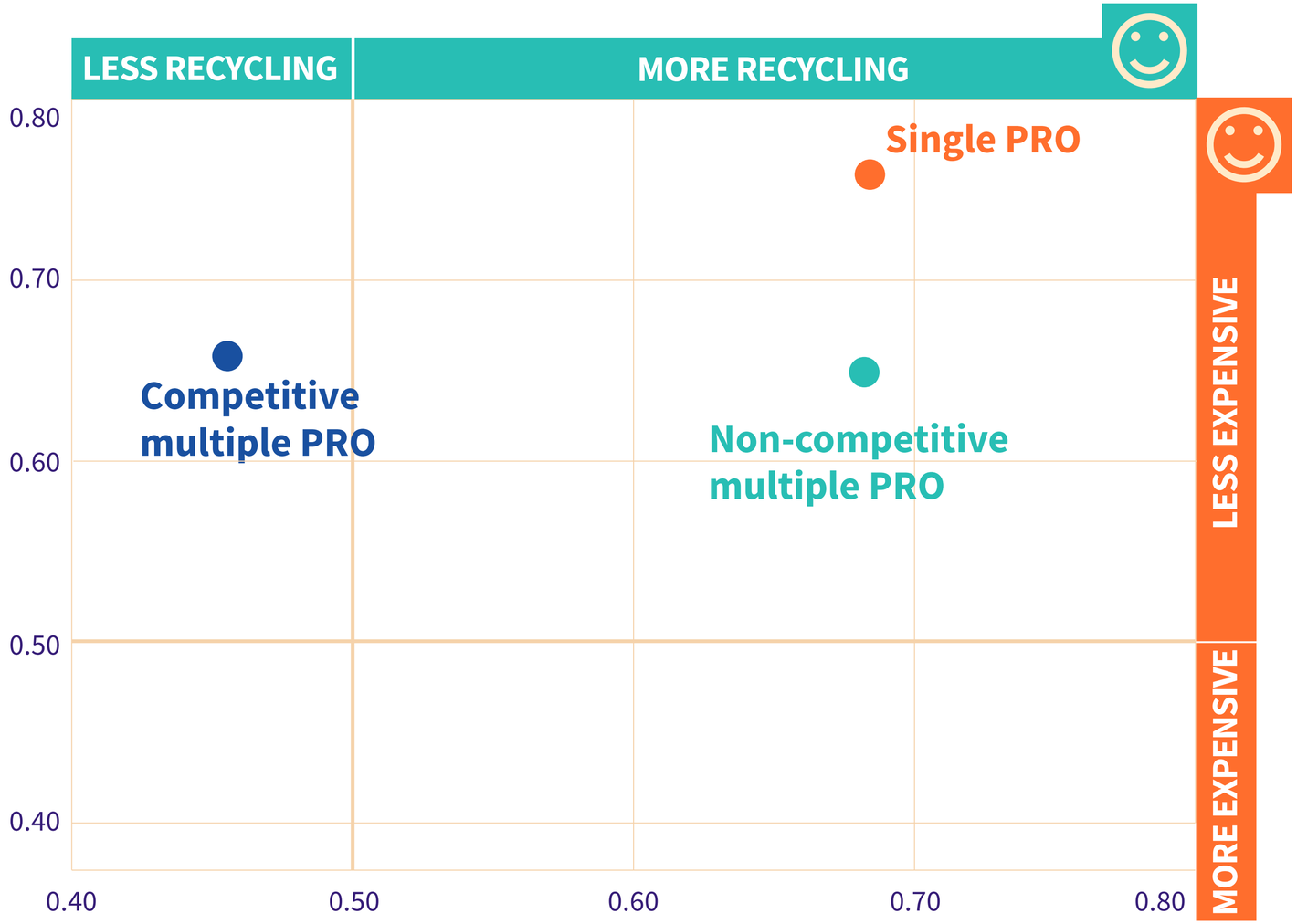


SINGLE PROs IN A NON-COMPETITIVE EPR SCHEME ARE MORE EFFECTIVE AND EFFICIENT

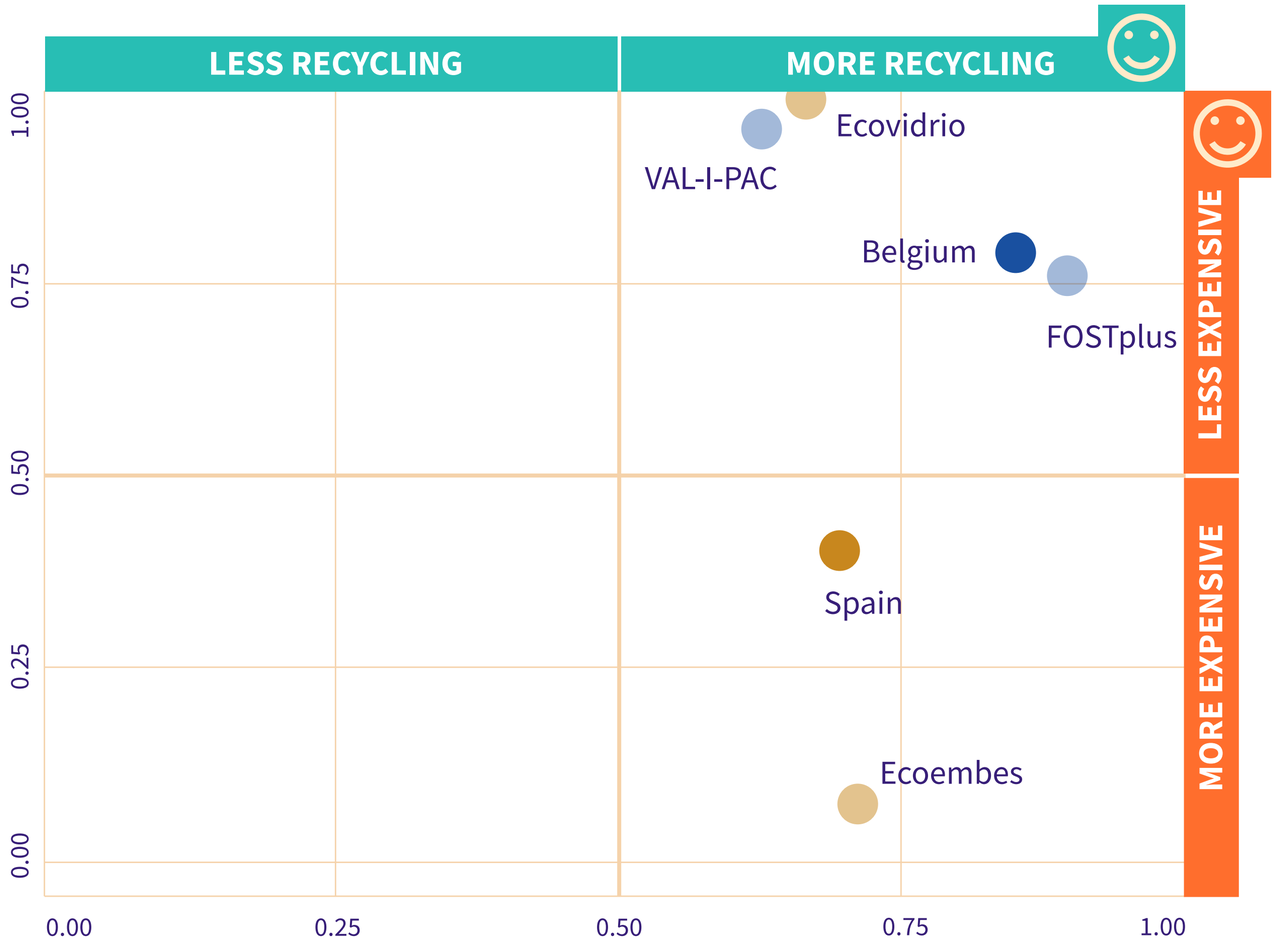
RECYCLING EFFECTIVENESS
ECONOMIC EFFICIENCY

Average comparison of
SINGLE/ MULTIPLE PROs
operating in
COMPETITIVE/ NON COMPETITIVE EPR schemes.

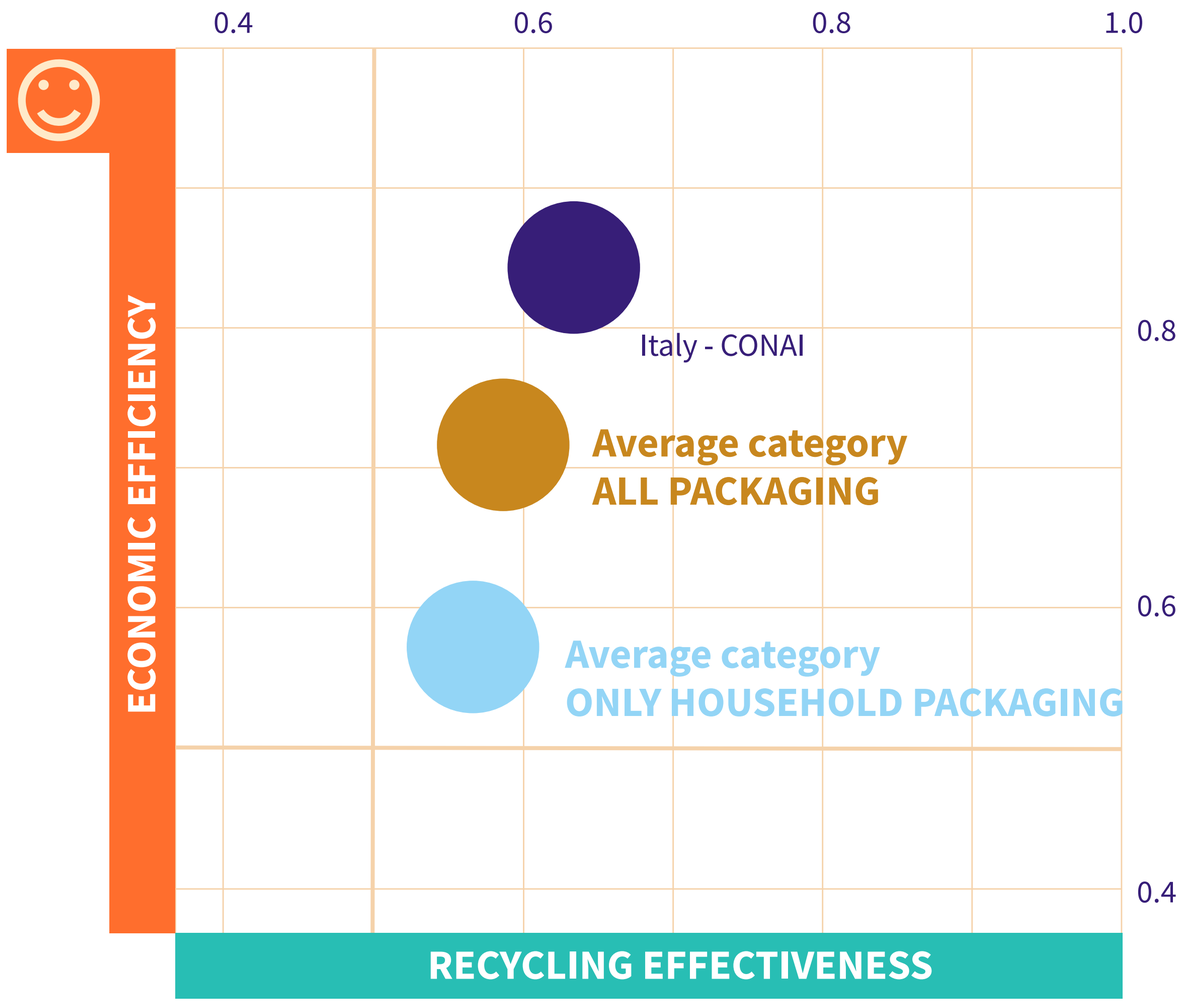


EXAMPLES OF MULTIPLE PROs IN A NON-COMPETITIVE EPR SCHEME: SPAIN AND BELGIUM

Examples of **Multiple PRO**:
Spain (Ecoembes + Ecovidrio)
and **Belgium** (Fostplus + Valipac).



CONAI IS MORE EFFICIENT, IN AVERAGE, IN RESPECT OF THE ALL PACKAGING CATEGORY



PROs that manage only **housegold packaging waste o** have, on average, **higher unit costs** than PROs which also include the commercial and industrial channel.

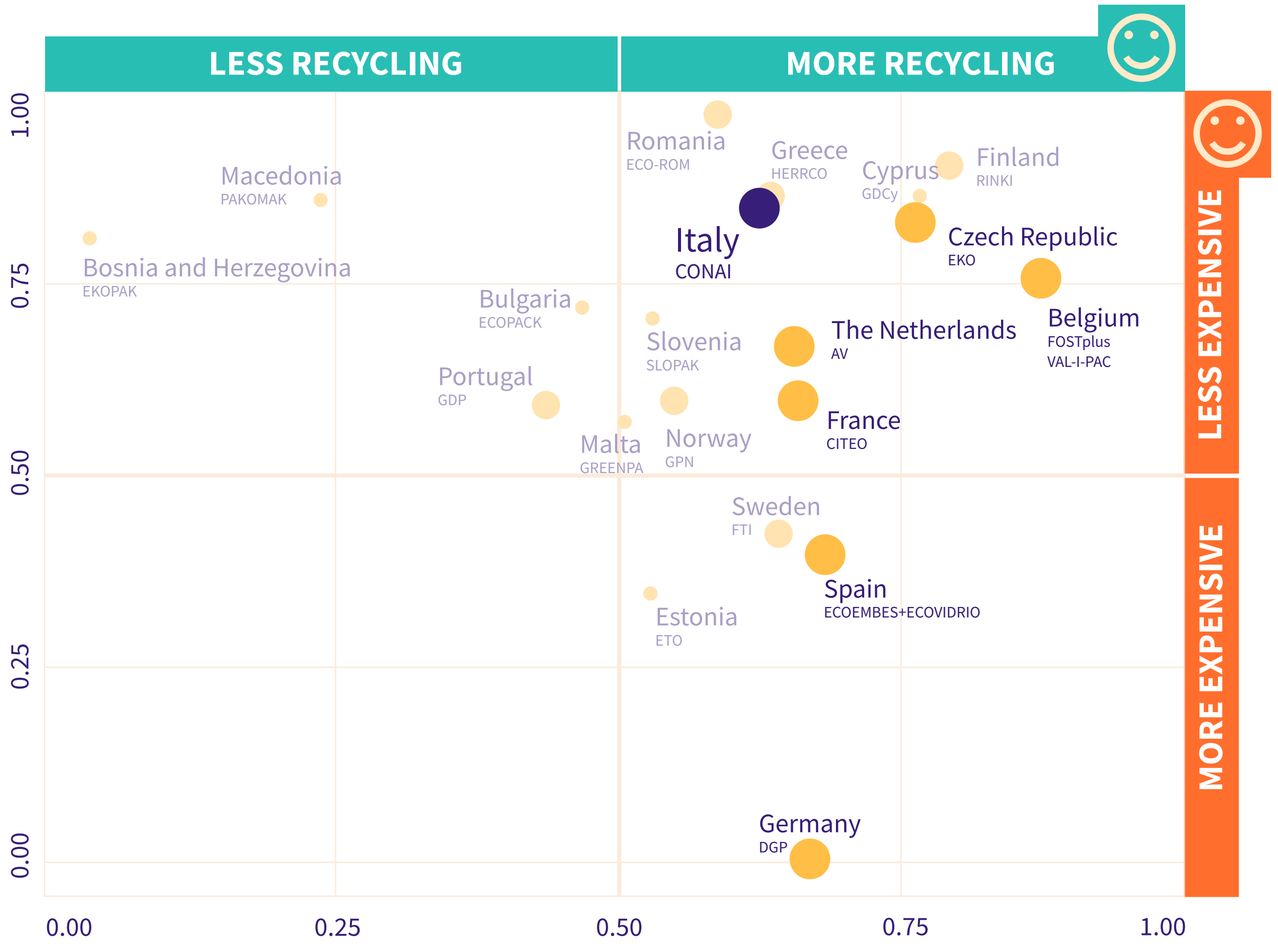
CONAI IS MORE EFFICIENT AMONG THE PROs OF THE MOST POPULOUS COUNTRIES

CONAI is the **least expensive** among the PROs of the **countries with more than 10 million inhabitants.**

LEGEND:

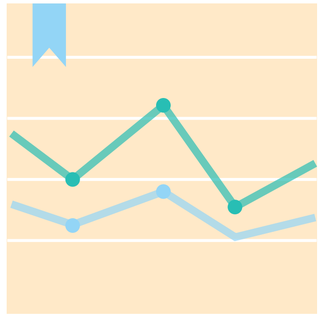
According to number inhabitant served:

- **small PRO**
- **medium PRO**
- **big PRO**



COUNTRIES ASSESSMENT

REGRESSION MODEL



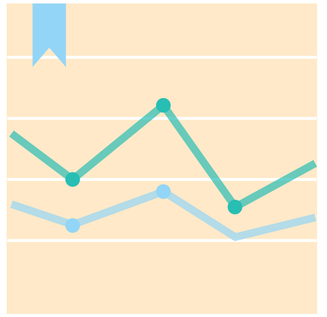
$$y_{it} = \alpha + \beta cost_{i,t} + \gamma EPR_{i,t} + \delta Waste_{i,t} + \theta Macro_{i,t} + \varepsilon$$

The regression model evaluates the impact on the performances of the characteristics of the EPR systems, taking into account of different specific elements in each country.
The regression combine the annual data (t) for all 27 Member states in EU (i), from 2010 to 2020.

The recycling rate value of each material is associated with several explanatory variables relating to the following characteristics:

- EPR system organization (EPR variables vector)
- National waste management (Waste variables vector)
- Macroeconomic Environment (Macro variables vector)
- Per capita cost of the EPR system (cost)

REGRESSION MODEL VARIABLES



Organization of the EPR system (EPR's variables vector)

Competition
EPR funding mechanism
Operationally responsible entity for the collection
Operationally responsible entity for recycling
Type of collection (container, door-to-door, combined)
Systems coexisting with PRO operations (DRS)
System activity channel (domestic, industrial, both)

National waste management (Waste variables vector)

Share of waste exported abroad
Public expenditure on municipal waste management per ton
Overall production of municipal waste

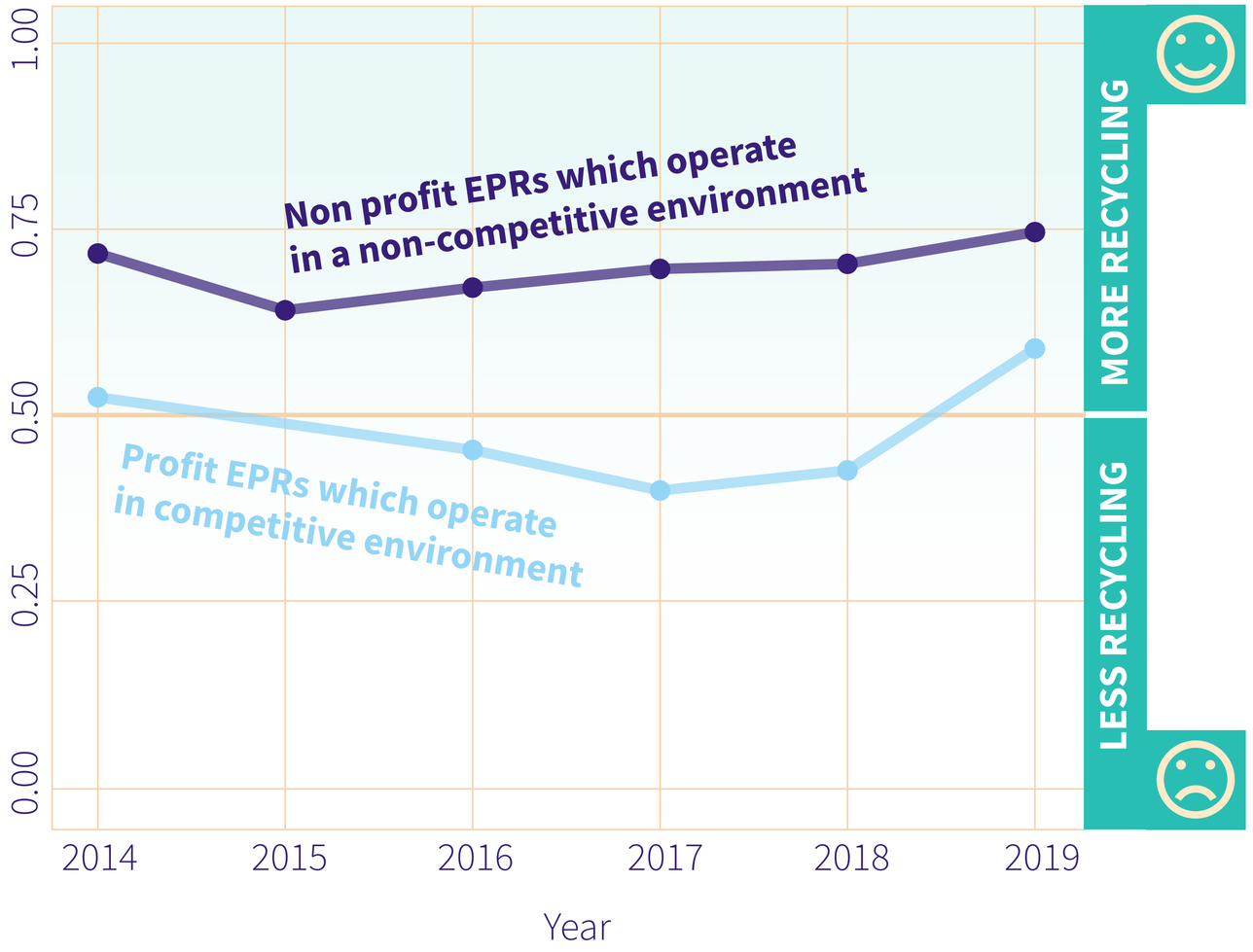
Macroeconomic Environment (Vector of Macro Variables)

GDP per capita
Population density
Secondary raw materials price

Per capita cost of the EPR system (based on the declared fees)

NON PROFIT EPR SCHEMES RECYCLE MORE IN A NON-COMPETITIVE ENVIRONMENT.

MORE EFFECTIVE BY 8 PERCENTAGE POINTS



A HIGHER RECYCLING RATE IS EXPECTED WHEN LOCAL AUTHORITIES ARE INVOLVED

Across all the packaging materials, the more effective and less expensive systems on average are the ones where local authorities are involved in the operational responsability of collection, in respect to the systems where only the PROs are involved.

MORE EFFECTIVE **MORE EFFICIENT**

AS IN ITALY

ECO-MODULATION CRITERIA

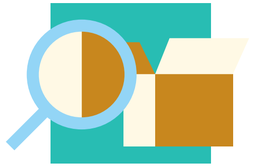
WHAT CRITERIA AFFECT THE FEES PAID BY COMPANIES?

ALL COUNTRIES

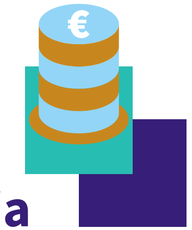
Qualitative and operational criteria

ITALY, NETHERLANDS, FRANCE, BELGIUM AND GERMANY

Material recyclability



ITALY



Economic criteria (net cost recyclability chain)

Packaging reusability

CONCLUSIONS of the EUROPEAN STUDY

This study shows that in Europe

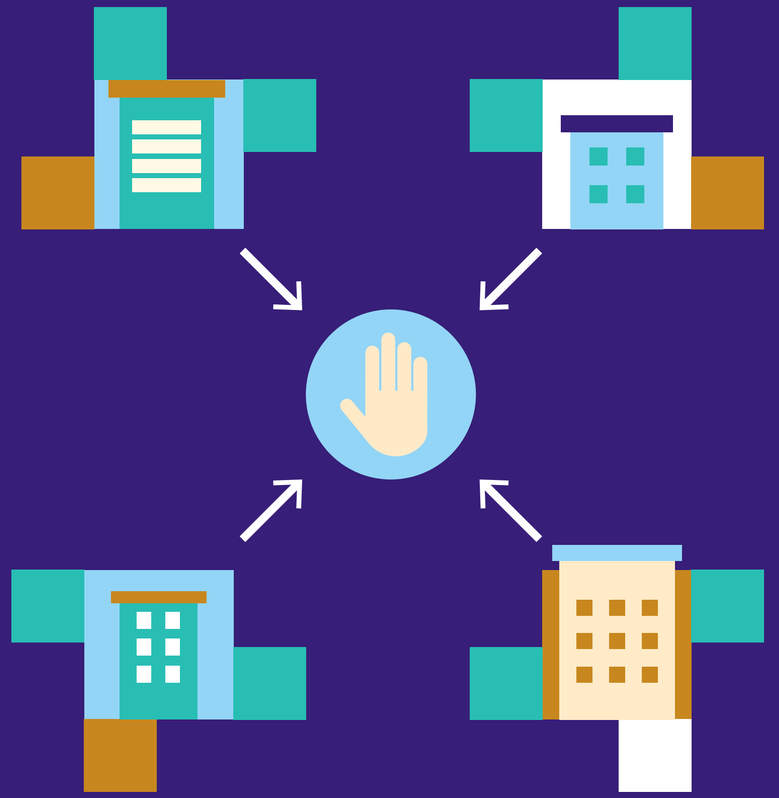
PROs' RECYCLING EFFECTIVENESS IS NOT NECESSARILY ASSOCIATED WITH HIGHER EPR SYSTEMS' COSTS.

This study shows that in Europe

SINGLE PROs IN A NON-COMPETITIVE EPR SCHEME HAVE RESPECTIVELY HIGHER RECYCLING RATES AND LOWER COSTS.

In addition...

IN A COMPETITIVE EPR SCHEME WITH MULTIPLE PROs, THE PRESENCE OF A CENTRAL COORDINATION COULD BE A SOLUTION TO GUARANTEE COMPETITION AND HOMOGENEITY IN A CONTEXT WITH DIFFERENT PROs IN THE SAME MARKET.



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