

GREEN LOGISTICS:

**OPTIMIZE YOUR PACKAGES TO REDUCE THE
ENVIRONMENTAL IMPACT OF YOUR SUPPLY CHAIN**





Article written by Antoine Perret,
cofounder of MACS in collaboration with Savoye.

Antoine PERRET, co-founder of MACS, puts his 15 years of experience at the service of sustainable supply chain transformation.

MACS Consulting is a Lyon-based supply-chain and operations performance consulting firm. Our goal is to improve the overall performance of companies by optimizing their processes and flows, from suppliers to customers.

To be resilient, our approach also takes into account all facets of sustainable development: economic, human and environmental. And for quick and lasting results, we rely on digitalization and driving change to accelerate the transformation of your business.

Website: <https://macs.consulting/>

GREEN LOGISTICS:

OPTIMIZE YOUR PACKAGES TO REDUCE THE ENVIRONMENTAL IMPACT OF YOUR SUPPLY CHAIN



INTRODUCTION

Logistics is the lifeblood of our economy. Without it, there is no link between producers and consumers, therefore no more industry or trade.

The severity of the consequences of climate change, however, requires that we now be more resource-efficient. **Logistics** will remain essential, but it **must adapt** today by reducing its impacts as quickly as possible.

In terms of **Greenhouse Gases (GHG)**, the main issues are linked to road and air transport. But whether it is the location of factories versus that of customers, or the availability of low-carbon transport alternatives, changes will take years.

In contrast, internal levers are available as of today: they are linked to order preparation by optimizing the use of packaging. Let's take a look at a concrete impact through the implementation at a distributor, a Savoye customer..

INITIAL SITUATION

A distribution platform for hardware, tools and industrial supplies, located in France and delivering more than 120,000 references directly or via its branches to professional customers:

- Managing 3000 orders / day
- Shipping an average of 3,800 packages per day
- Using 5 different conventional RSC (US cases) carton formats, manually formed and closed
- With a 43% carton filling rate (o i.e. 69m3 of empty space shipped daily)

The project: the implementation of a latest generation WMS and three packaging lines, combining PAC600 formers and Jivaro closing machines from Savoye.

ELIMINATE, REDUCE, RECYCLE:

THE CORRECT OPTIMIZATION ORDER!

Eliminate:

The package with the lowest impact... is the one that we did not send!

The customer deadline defined in the service policy may make it possible to not send a partial delivery, or to group together orders for the day or even several days. The use of advanced WMS (Warehouse Management System) solutions makes it possible to consolidate successively placed orders in a single package.



And the item nesting functions play an optimized game of Tetris, using the hollows of the ordered items (e.g.: delivering reams of paper inside wastebaskets, etc.). Finally, the WMS selects the carton best suited to the grouped order from amongst several formats.

We can thus eliminate 20% of packages sent, i.e. 120 tons of cartons and 100 tons of CO2 per year.

Reduce:

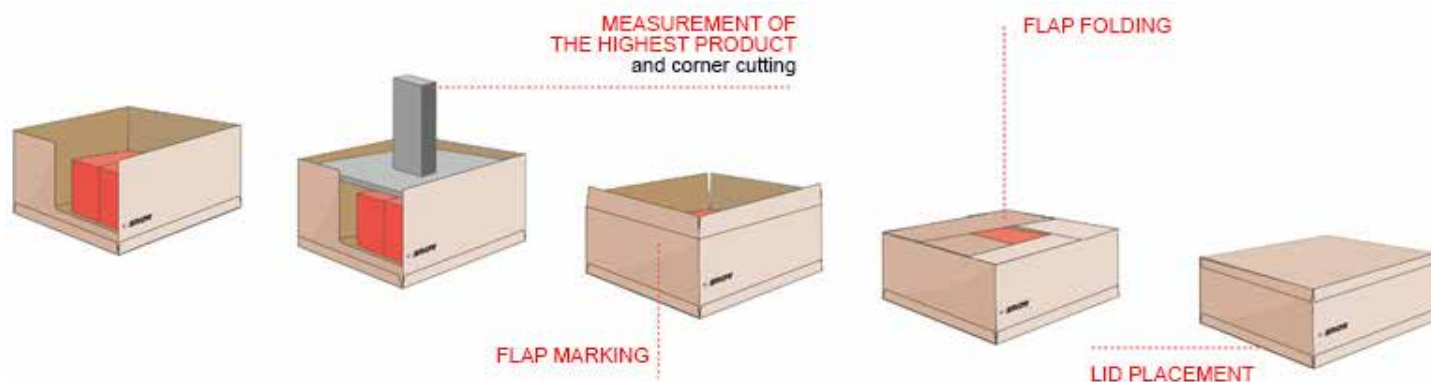
For reasons of purchase optimization and station availability, it is not possible to use an infinite number of cardboard formats. Or rather it is possible, by adjusting the height of each carton.



Thanks to Jivaro automated closing machines, the height of the carton is precisely adjusted to the content.

ELIMINATE, REDUCE, RECYCLE:

THE CORRECT OPTIMIZATION ORDER!

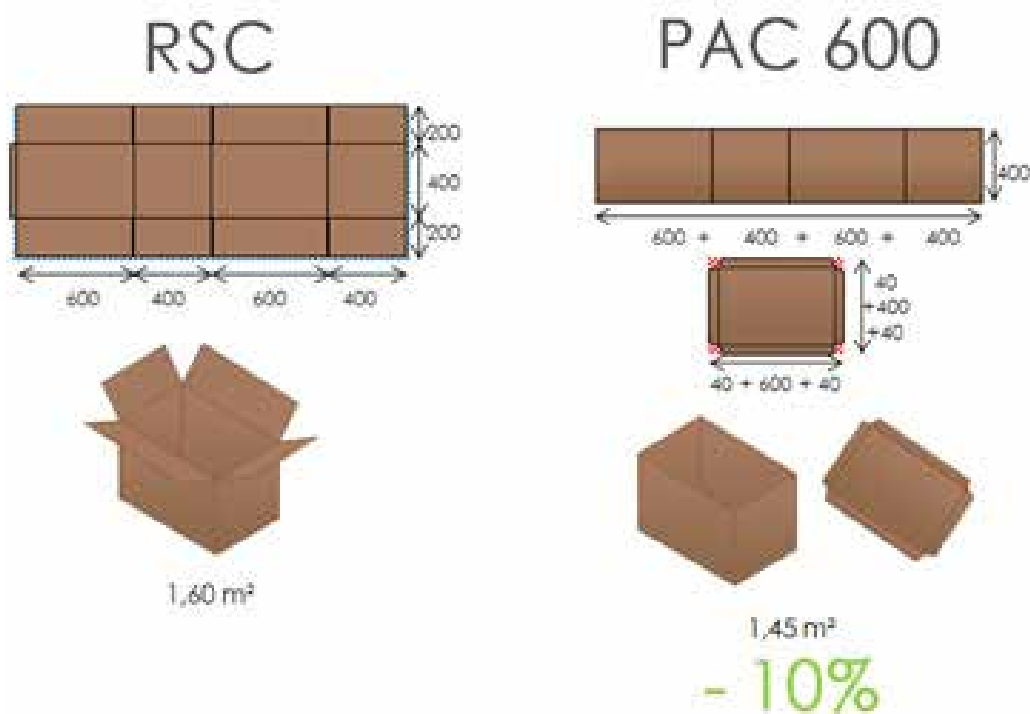


While rationalizing the number of package formats from 5 to 3, the combination of Jivaro machines with PAC600 formers offers three advantages:

Carton type optimization

1

By using PAC 600 belt and double lid cases, reduces the required surface area of cardboard by 10% compared to US cases (from 2745 to 2439 m² per day). After one year, this represents **35 tons of CO₂**.



ELIMINATE, REDUCE, RECYCLE:

THE CORRECT OPTIMIZATION ORDER!

2

While the initial **fill rate** was 43% in our case (corresponding to the average fill rate observed in e-commerce), the fine height adjustment increases this rate to **78%** and makes it possible to **eliminate the need for wedging**. That is an additional gain of 700 kg of paper per day. This is equivalent to **66 tons of CO2** per year.

3

Finally, each day nearly 60 m³, i.e. the volume of a truck trailer is saved. Assuming a 100 km round trip to reach the shipping hub, 30,000 km of trucks are avoided per year, i.e. **39 tons of CO2**.

Recycle:



This seems obvious. This is in fact what almost everyone does, thinking they've sorted the problem through recycling. They're wrong...

Studies by Federec (Federation of Recycling Companies), taken up by ADEME, show that the production of **recycled cardboard**, though it uses 4 times less energy, **emits twice more CO2 than virgin cardboard**. This is primarily due to the efficiency of the new cardboard manufacturing processes.

Results per ton collected	Primary material (kWh)	Recycled material (kWh)	Primary material (kg eq. CO2)	Recycled material (kg eq. CO2)
Paper stock	9 193	2 739	297	317
Cardboard	13 115	3 017	390	670

Result of the FEDEREC study (2017)

If we take into account other parameters such as land use, we can conclude that there is a draw between virgin and recycled cardboard. This reinforces **the benefit of limiting the use of cardboard upstream**.

Step	Lever	CO2 gain	
Eliminate	Package consolidation by the WMS	135 T	135 T
Reduce	Cardboard surface area reduction	35 T	141 T
	Elimination of wedging paper	66 T	
	Reduced transport needs	39 T	
Recycle	Recycled cardboard	None	-

ELIMINATE, REDUCE, RECYCLE:

THE CORRECT OPTIMIZATION ORDER!

Ultimately, more than **140 T of CO₂** are saved each year thanks only to the 3 packaging lines implemented. This corresponds to the amount of **CO₂ emitted to circle the earth 18 times by car.**



The 3 circles of sustainable development: reconciling the environment with human and economic considerations.



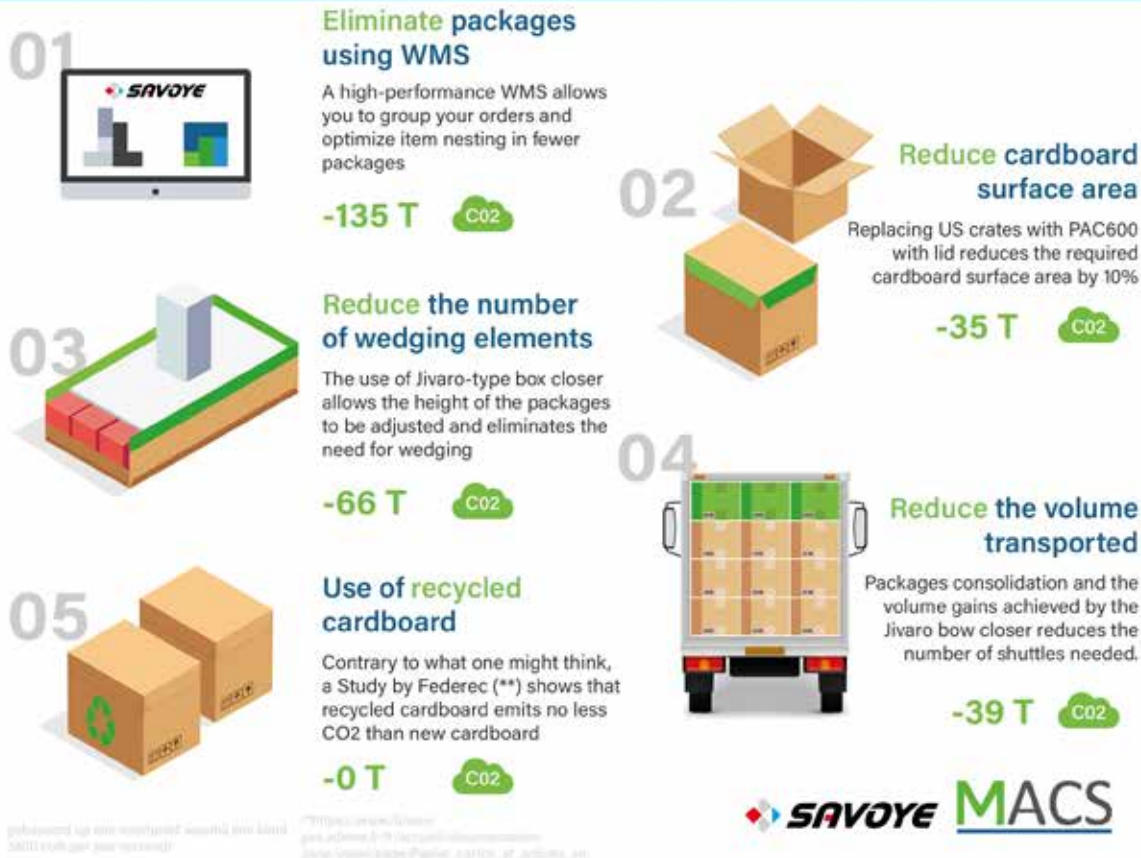
Beyond the environmental aspects, the **reduction in consumption has an economic impact**. Thanks to the gains in the surface area of cardboard purchased and the efficiency of the workforce, the **return on investment** of packaging lines combining PAC600 and Jivaro machines is of the order of **3 years**, while these machines are designed to last more than a decade, with an extremely low number of wear parts.

If we estimate a **carbon tax** of 120 per ton of CO₂ (current value in Sweden), the economic gain linked to GHG emissions is of 170 K over 10 years.

Equally important is **customer perception**. Over-packaging has no added value from the customer's point of view.

Worse, while 53% of online sales customers claim to take the environmental aspect into account in their purchases, **receiving packages that are half empty or filled with wedges gives a negative view upon receipt**. This is particularly true for professionals who must also pay a cost of removal proportional to their volumes of waste.

THE 3 CIRCLES OF SUSTAINABLE DEVELOPMENT: RECONCILING THE ENVIRONMENT WITH HUMAN AND ECONOMIC CONSIDERATIONS.



SAVOYE:
BEST IN CLASS AUTOMATION
FOR YOUR LOGISTICS
AND SUPPLY CHAIN NEEDS

ADVANCED TECHNOLOGIES

Order preparation of light loads

X-PTS Goods-to-Person solution, smart conveyors,
high-speed sorting systems, robotics

Automation of shipping packaging

JIVARO, e-JIVARO, PAC 600, lidding, cardboard
wedging

Automated storage of heavy loads

MAGMATIC

ADVANCED SOFTWARE

Warehouse management and flows control

OMS, WMS, WCS, TMS, EDI



EXPERTISE MÉTIER

SAVOYE operates in key business sectors and has specific expertise in each area.

The SAVOYE service offer is built on high-level “professionspecific” expertise. We provide tailor-made solutions for every type of logistics warehouse, from the simplest to the most complex layouts.

Retail logistics: 3PLs, specialist distribution

Multi-channel logistics: retail, e-commerce, mail-order

Industrial logistics: food, health and pharmaceutical industry, industrial supplies