EFESO
MANAGEMENT CONSULTANTS

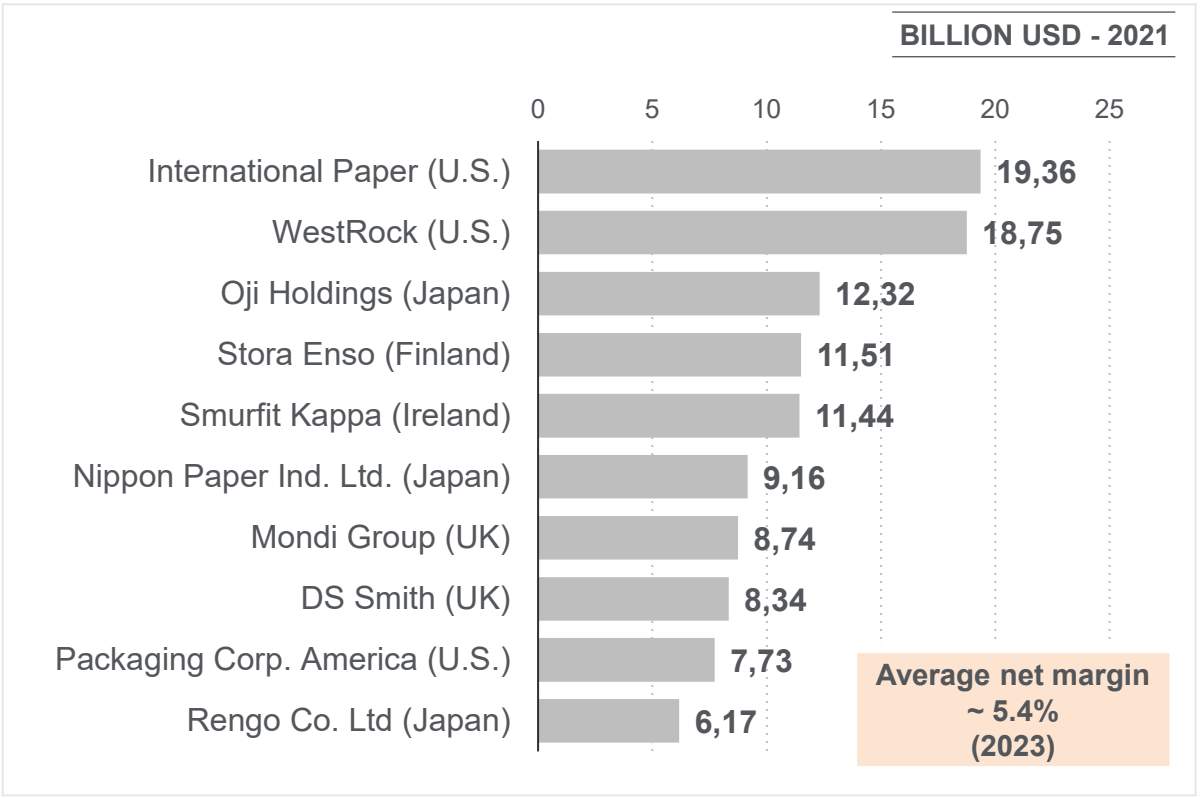
OPTIMIZING PACKAGING COSTS

Sustainable and cost-effective solutions for packaging and carbon efficiency

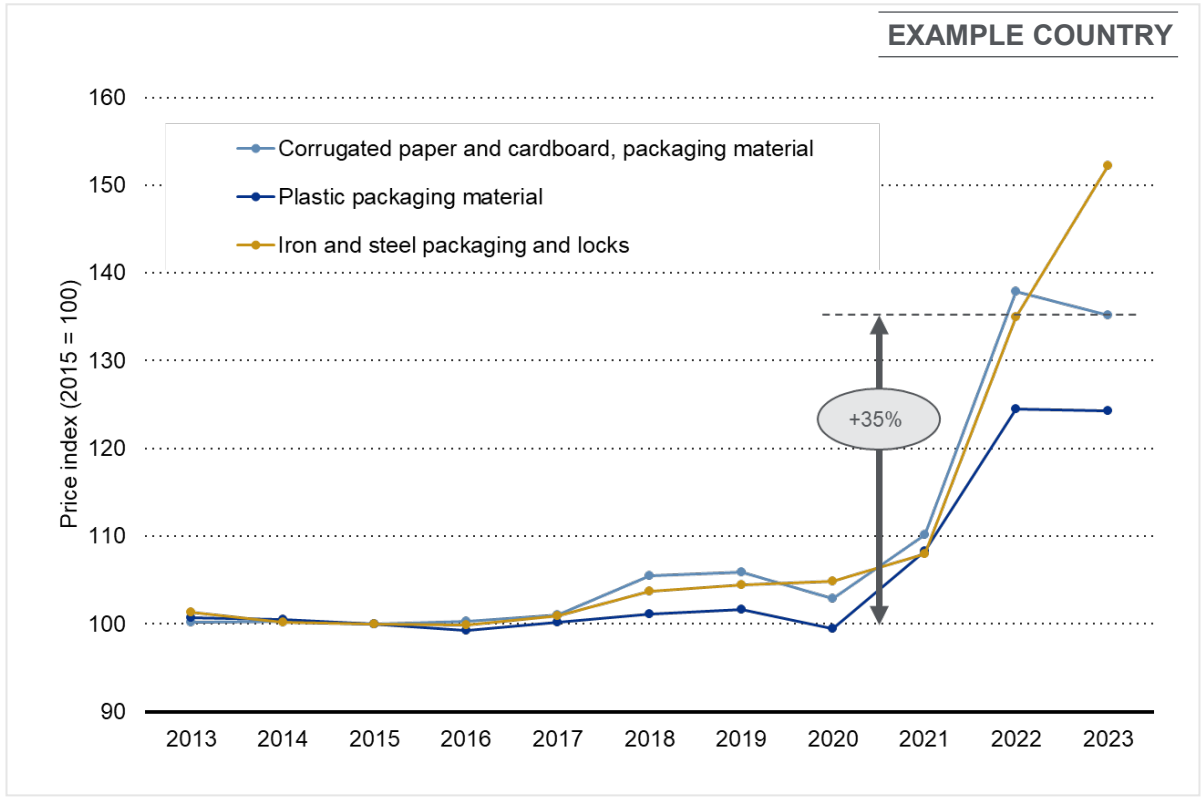
SUSTAINABILITY
INSIGHT

The packaging industry: global players with multi-billion turnover. Typical packaging producer price indexes show significant increases over the past three years

Revenue of leading paper packaging firms



Producer price index of packaging in Germany



Paper packaging industry includes corrugated case material (container board) and carton board applications

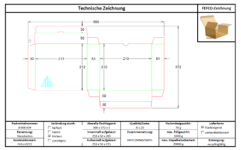
Price index of corrugated and cardboard packaging material increased by 35% within three years

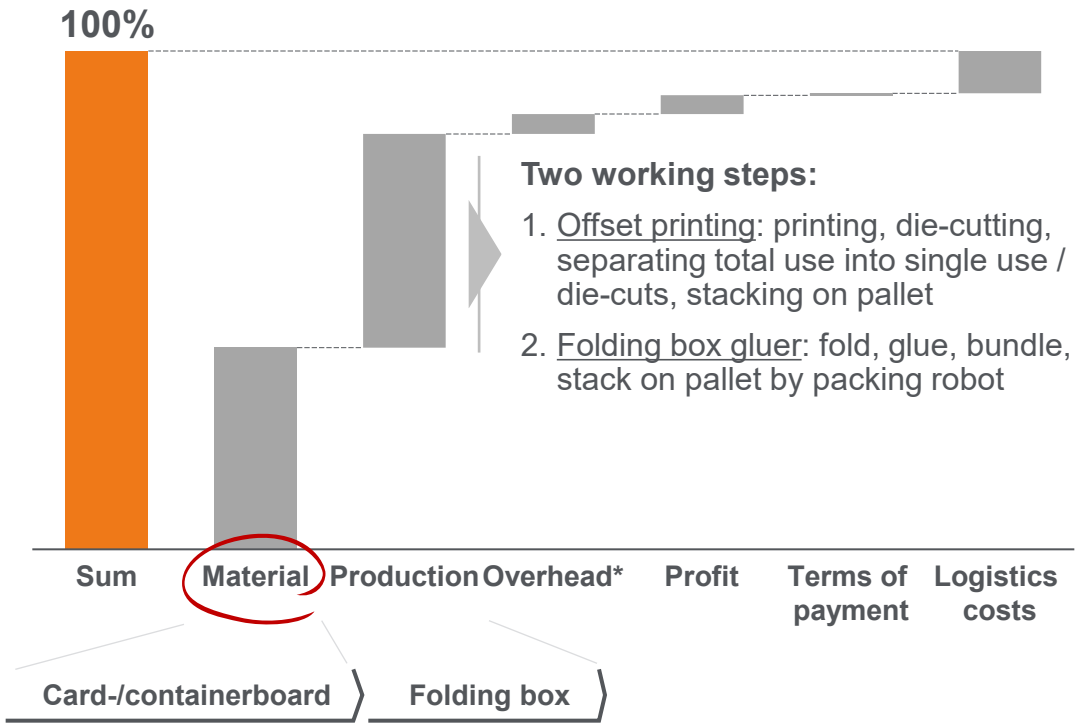
Source: STATISTA, EFESO research

Typical cost structure of cardboard packaging boxes: examples from ‘bottom-up’ case studies show the significance of material costs from upstream processes

General packaging / transportation container

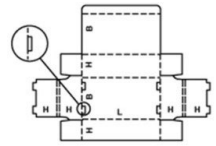
Die-cut cardboard

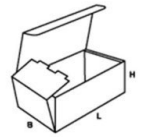




Product-specific container

Flip cover box with 2-color printing





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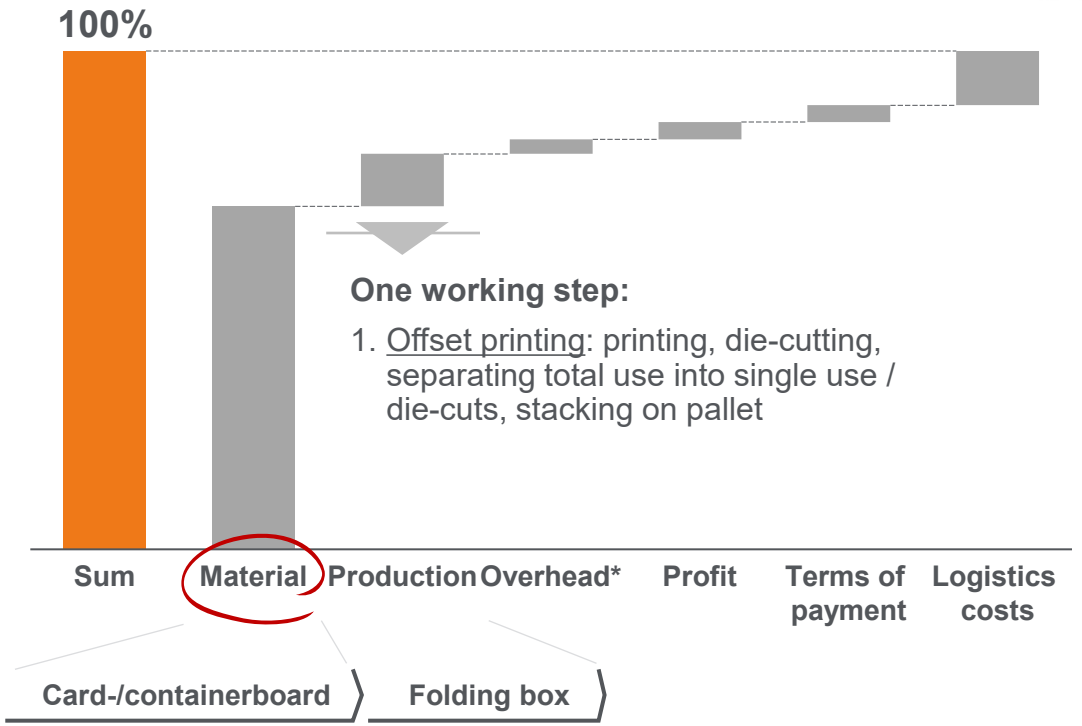
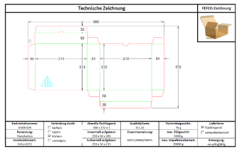


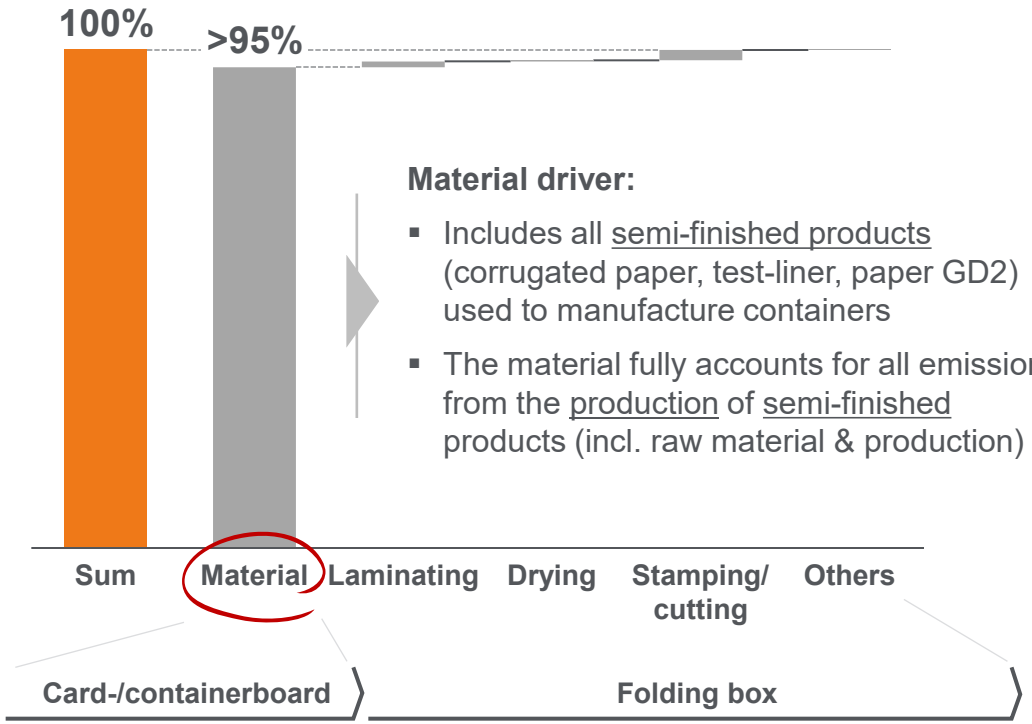
Source: EFESO project experience

Typical CO_2e emission structure of packaging cardboard boxes – examples from case studies show significance of material impact from upstream processes

General packaging / transportation container

Die-cut cardboard





Product-specific container

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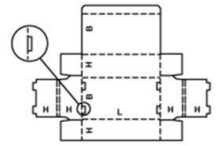
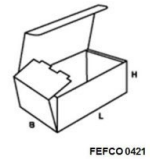
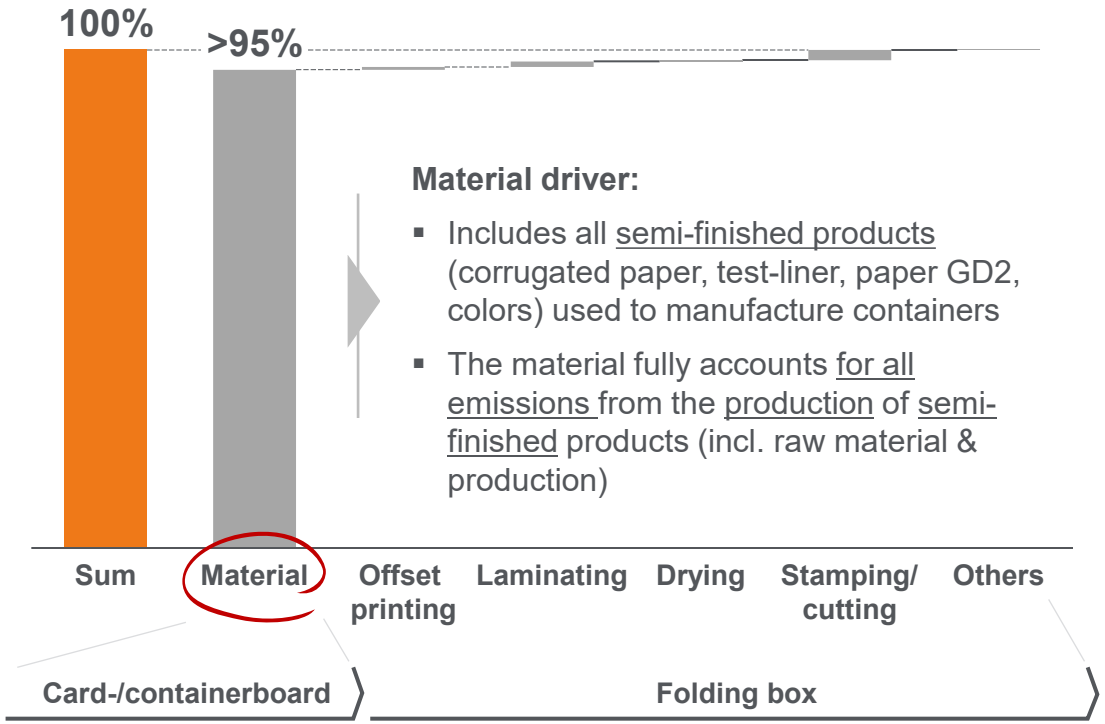




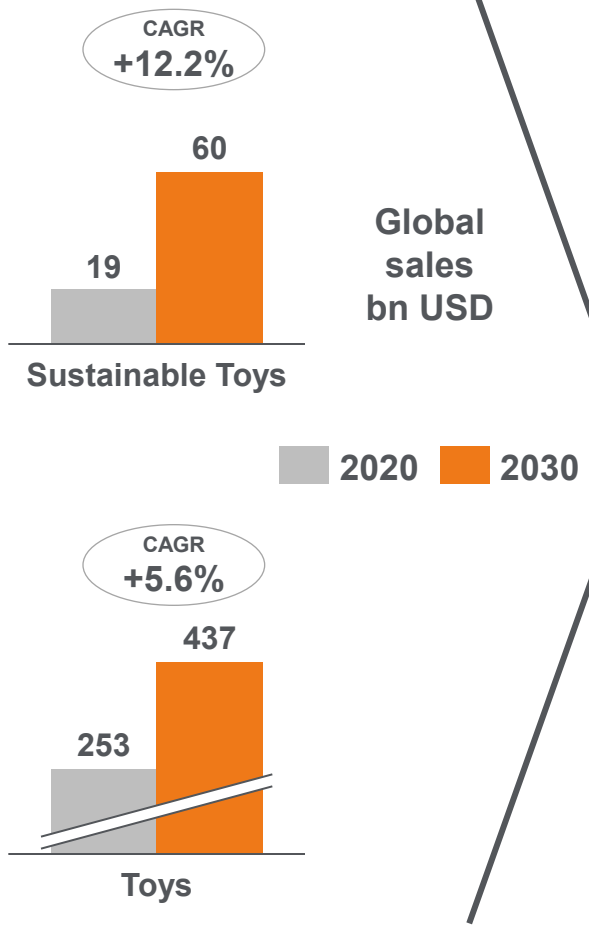


Source: EFESO project experience

Case study: The global toy industry is facing societal pressure and is having to address ‘mega trends’ in consumer behavior

Global toy industry perspectives*

- **Growth** of **sustainable toy sales** up to 2030 by ~12%, and **outpacing overall** growth of **toy sales growth** by ~ 5.6%
- The shift towards sustainable toys is driven by **consumer perception** on **environmental impact** of toys on our planet
- In response, toy-making companies are heavily engaged in **adapting** the **business setting**
- New **materials** and **packaging** concepts are key while a **continued cost focus** remains crucial to the bottom line



‘Global nameplate retail client’s’ view**

Sustainable materials

'The most challenging mission before us is to make all ‘core’ products from **sustainable materials** by **2030**.'

Sustainable packaging

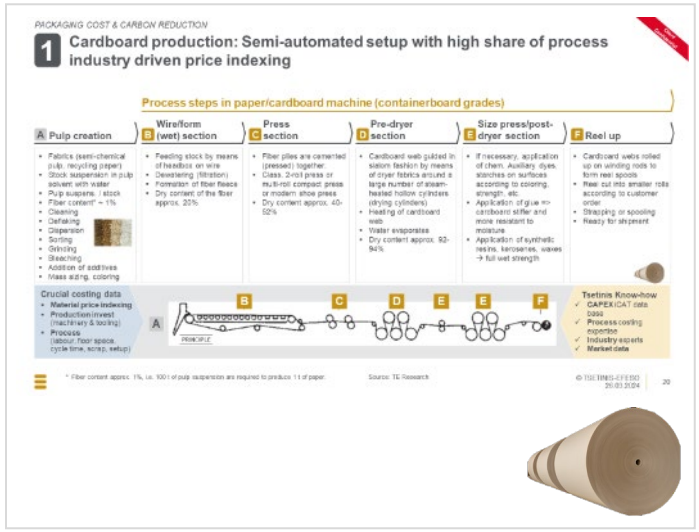
It’s our aim that by **2025** all **packaging** will be from **renewable** or **recycled materials**, and will be made as efficiently as possible, and easy for consumers to recycle.'

Impact on **product** and **packaging** design and **costing?**

*Source: EFESO research
**Source: From a ‘Global Nameplate Retail Client’ homepage

Manufacturing process drill-down: cardboard box production requires three distinct manufacturing processes

1 **Cardboard** production



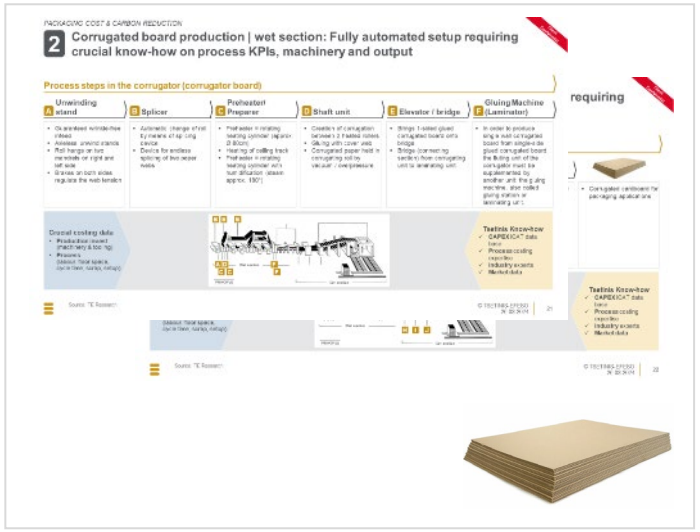
Cardboard (rolls)

Cost reference: €/ton or €/m
Semi-automated process

Typical ***costing*** *input*

Market data

2 **Corrugated board** production

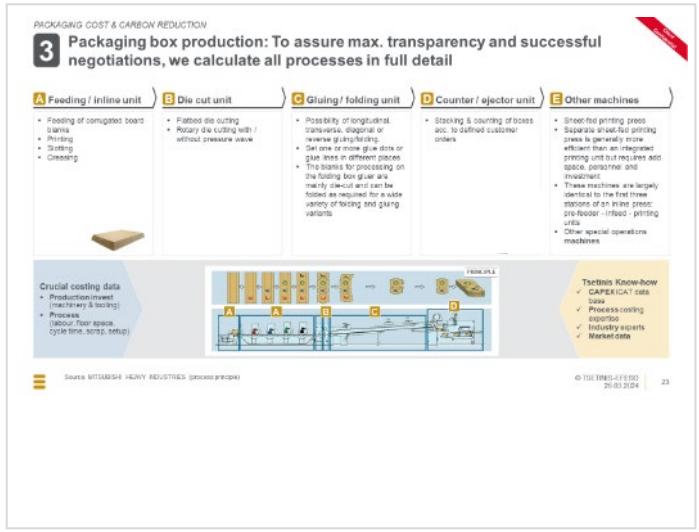


Corrugated board (sheets)

Cost reference: €/area size
Fully automated process

Process parameters

3 **Packaging box** production



Packaging (boxes)

Cost reference: €/part
Semi-/ fully automated process

Process parameters

Characteristics / cost drivers within the supply chain that need to be considered in a cost analysis and optimization of cardboard production and procurement

1 Cardboard production

- Volatile recycled paper supply markets, due to increased demand → volatile mixed paper prices
- Composition of mixed recycled paper can vary significantly
- Excess capacities of paper production lines being modified for container grade paper (key brands: Voith, Valmet, …)
- High fixed-cost share, avg. material conversion per line
  ~ 50 tons/day
- Index-based cardboard pricing commonly utilized

2 Corrugated board production

Cost driver:

- # of liners and waves,
- share of kraft liner,
- grammage (g/m^2),
- process materials (energy, water, glue)
- quality specifications

3 Packaging box production

Cost driver:

- card-/containerboard types (incl. wave types)
- # of printing colors and printing type
- box design complexity & quality specifications
- Production volume and lot sizes

	Cardboard (rolls)	**Corrugated board (sheets)**	**Packaging (boxes)**
	Cost reference: €/ton or €/m Semi-automated process	Cost reference: €/area size Fully automated process	Cost reference: €/part Semi/fully automated process
Cost & carbon transparency	***Medium*** *(key input parameters known)*	***High*** *(validated bottom-up modeling)*	***High*** *(validated bottom-up modeling)*

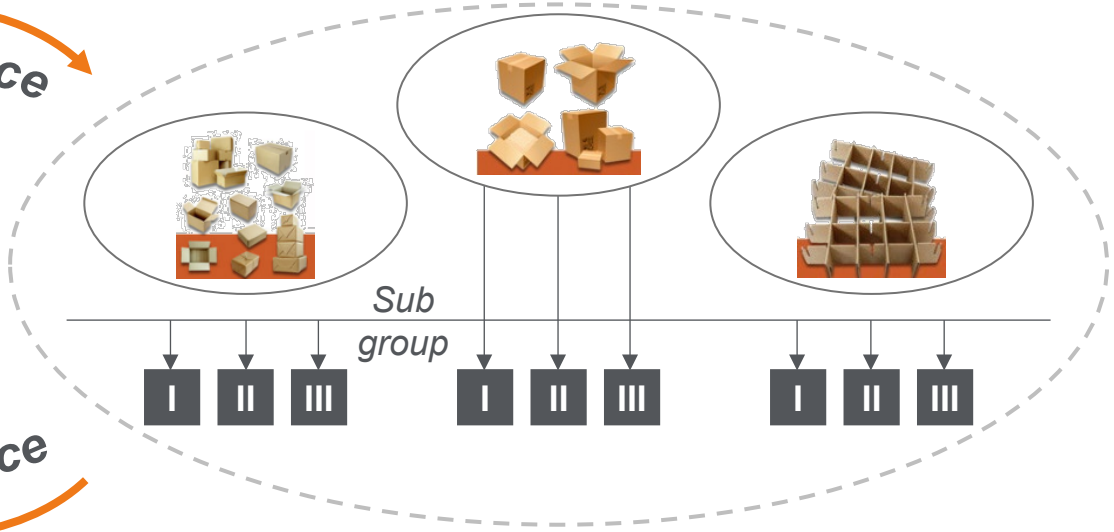
Commercial options to optimize packaging cost, based on combination of rigorous ‘should cost’ modelling and the execution of two major supply ‘bundling’ concepts

Country-based bundling

Approach

- Select countries / build-up cluster / subgroups per country
- Define representatives per country and cluster
- Cost structure analysis
- Supplier market research
- RFQ / benchmarking
- Negotiation / awarding

Cluster-based bundling



Approach

- Build-up clusters / subgroups
- Suppliers market research per cluster / subgroup
- Define representative parts per cluster / subgroups
- Cost structure analysis
- RFQ / benchmarking
- Negotiation / awarding

Our four-step packaging operations excellence program starts with an initial assessment of packaging topics at our clients. Tangible results are always the goal…

I. On-site appointment

to assess the existing situation

Quick check

- Quick assessment of existing packaging product, operations and procurement topics
- Interviews with staff in production engineering, controlling and procurement
- Identification of areas for improvement and possible pilot projects

1-2 day(s)

II. Piloting

of a 'specific packaging project' (bottom-up)

Proof-of-concept

- Project selection based on greatest impact
- Set up of piloting team
- Execution of pilot, impact evaluation and estimate of overall benefit for client

4-6 weeks

III. Project

Holistic packaging optimization/reduction

Tangible results

- Blended ‘top-down/bottom-up’ approach
- Top-down: packaging & packing scoping, overall structuring of optimization levers and timing
- Bottom-up: detailed cost & carbon engineering approach including procurement / operations support

12+ weeks

IV. Delivery & rollout

of 'packaging reduction program' globally

Global leverage

- Set up of global rollout team (factories, countries, regions)
- Execution of global rollout
- Tracking and reporting of deliverables and generated impact
- 'Lessons learned' feedback loops to optimize the rollout of the program ‘on the fly’

12+ months

Key elements of EFESO packaging cost & carbon improvement, designed to generate tangible packaging cost reductions and strengthen supplier relationships

Key Element	Details	EFESO USPs*
Bottom-up cost & carbon transparency	Bottom-up, **manufacturing process-based cost modelling**, software backed & x-industry proven Utilization of **validated parameter set** on labour, energy, machinery & carbon emission factors Integration of **product carbon footprint** transparency based on same manufacturing process data	★★★★★
360° view of commercial **supplier relationship**	Review of **key supplier aspects** such as product, business, innovation, sustainability and performance Consolidated **360° picture** of supplier Derivation of recommended **strategic actions** for continued supplier relationship	★★★★☆
Validated manufacturing process understanding	**Validation** of bottom-up **cost model** at manufacturing site and backed by brownfield site (parameters) Identification of potential **loss-makers** in processes and technology applications **Gap analysis** and **opps generation** to drive manufacturing process optimization	★★★★★
Benchmarking insights on **competitive best-practice**	Expansion of cost base with benchmarking insights from **best-practice production sources** Conduct **RfQ initiatives** to back-up market intelligence insights Integrate benchmarking insights to manufacturing insights	★★★☆☆
Structured preparation of **supplier** engagement and negotiation **toolset**	Preparation of fact-based supplier **storybook** and negotiation **playbook** Validate **potential alternatives** to incumbent supplier setup Conduct supplier engagement **dry-runs**	★★★★☆
Negotiation support and boost of supplier relationship	Safeguard commercial negotiation with clear **communication plan** Support **execution of negotiation** to reach tangible results Pursue supplier **relationship booster** elements	★★★★★

*EFESO unique excellence level based on client feedback

We assisted a globally known toy manufacturer in implementing a cost-engineering exercise that resulted in up to 20% savings on packaging costs

Initial situation

- Strategic decision to implement x-industry known cost-engineering capabilities incl. CaaS technologies, with objective to support purchasing during supplier negotiations using relevant factual data, particularly on limited competitive supply markets
- Client intends to review key procurement commodities such as packaging and outsourced product packing volumes

Approach / method

- Product cost optimization for packaging boxes and product instructions (leaflets, perfect binds) consisting of
  - Cost structure analysis (CSA)
  - Supplier analysis and validation
- Product cost optimization of outsourced packing scope:
  - Cost structure analysis (CSA)
  - Supplier analysis and validation

Customer value added

Empowerment of inhouse **cost engineering** team to support procurement

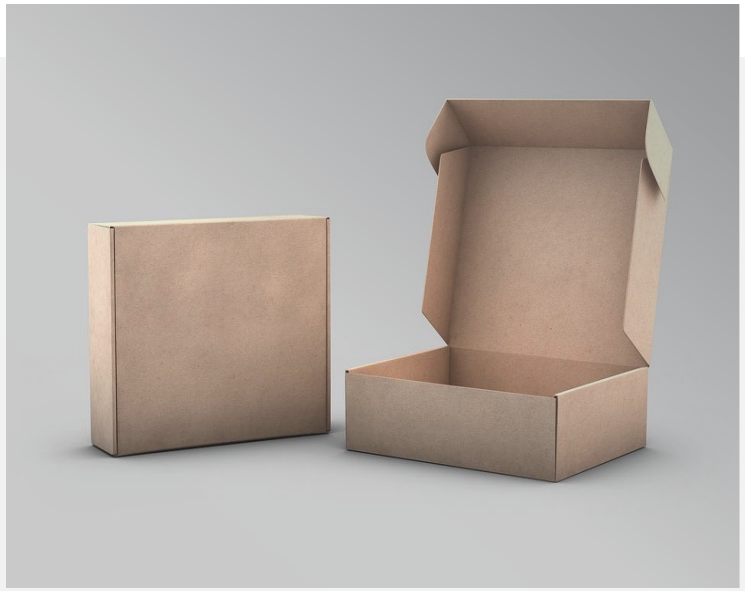
Process mapping of all packaging and packing scopes with **bottom-up 'should cost' modelling**

Validated **packaging cost reduction opps** of up to **20%** across multiple SKUs

Validated **packing cost reduction opps** of up to **30%** across multiple SKUs

CaaS: Costing as a Service; SKU: Stock keeping unit

We helped an OEM to reduce its overall packaging costs by about 14%



Initial situation

- Automotive OEM holding 15 suppliers for corrugated cardboard and outer packaging in Europe (scope > 20m€)
- Target: consolidate the corrugated cardboard suppliers in four locations

Approach / method

- Clustering of cardboard packaging (e.g., folding boxes, blanks)
- Cost Structure Analysis (CSA) and bottom-up calculation of corrugated parts
- Market research and RfQ (definition of bidder list and benchmarking)
- Preparation and support of negotiation
- Nomination of strategic suppliers and implementation

Customer value added

Volume-based renegotiation of packaging spend with **intelligent procurement split**

Average savings approx. **14% -** 28m€

New contracts signed with 9 suppliers

Hand-shake of **approach** and **data** results to client

EFESO credentials in the packaging industry

GERRESHEIMER · ELOPAK · Berry · flexi · Huhtamaki · O-I · AVERY DENNISON · Klabin · schreiner Group · Obeikan · global closure systems · DS Smith · greiner ASSISTEC · Impress · SIG · SGD PHARMA · rkw · BILLERUD · mondi · Tetra Pak · amcor · Grupak · HIT HOLZ · storaenso · Seda · DIXIE TOGA · Hamburger Containerboard PRINZHORN GROUP · etimex · greiner PACKAGING · PGi · manu packaging DEUTSCHLAND · Bemis · ArdaghGroup · PLASTICO SPS · NOVOLEX · FLEXIBLE PACKAGING · Constantia Flexibles · VERESCENCE · mactac · ALBÉA packaging and more · UFLEX · Ball · EUROPLAST · Stevanato Group · ep group · PRINZHORN GROUP · TROMBINI

Worked with 6 of the top 10 global industry leaders

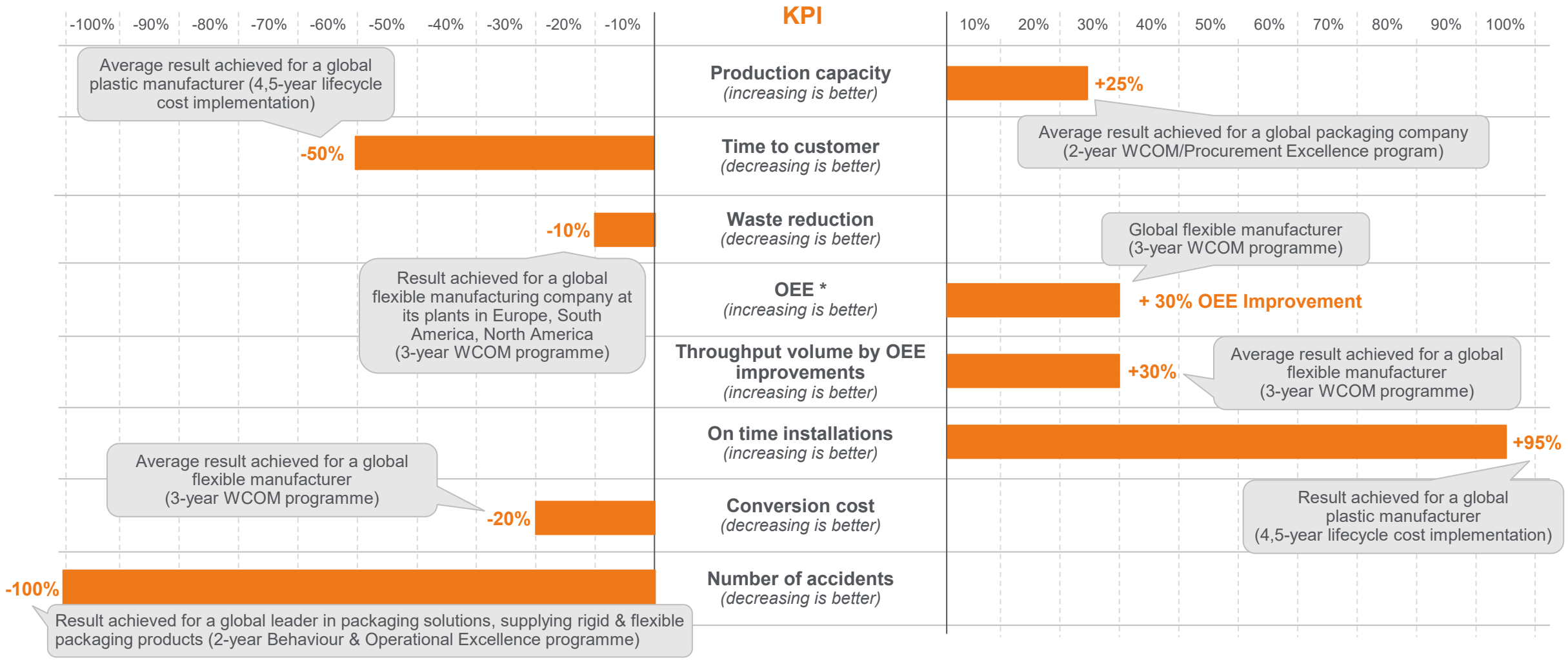
Active in the industry for more than 40 years

> 320 successful projects completed globally in the last 3 years

> "EFESO's world-class operations management program improved production efficiencies and expanded our capacity for value-added products, while our facility consolidation program reduced capacity in other areas. Looking ahead, our positive momentum will allow us to invest in growth opportunities."

President and CEO,
Packaging company

EFESO packaging process optimization at factory site: excellent results in the flexible packaging industry

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