

PRINCIPAL ACADEMIC TUTOR

Deborah Panepinto, Department of Environment, Land and Infrastructure Engineering, Politecnico di Torino

ACADEMIC TUTOR

Vincenzo Riggio, Department of Environment, Land and Infrastructure Engineering, Politecnico di Torino

Lucia Rigamonti, Department of Civil and Environmental Engineering, Politecnico di Milano

Michel Noussan, Department of Energy, Politecnico di Torino

Giulio Zotteri, Interuniversity Department of Regional and Urban Studies and Planning, Politecnico di Torino

EXTERNAL INSTITUTIONS

Procter & Gamble (P&G)

Eurodisplay

EXTERNAL TUTOR

Iolanda Napolitano, P&G

Giovanna Ricca, P&G

Andrea Tempesta, Eurodisplay

TEAM MEMBERS



Flavio Pino,
Management Engineering,
Politecnico di Torino



Benedetta Beltrami,
Integrated Product Design,
Politecnico di Milano



Nadia De Felice,
Chemical Engineering,
Politecnico di Milano



Mattia Manelli,
Management of Built Environment,
Politecnico di Milano

ZEGODI

Executive summary

The ZEGODI project involved the analysis of the goods display sector: these are marketing tools that you can find in stores and that help to highlight promotion. The main issue is that environmental and economic impact of goods displays is strongly underestimated both by companies and stores. Thus, P&G, our industrial partner in the project, asked us to quantify the problem and find a systemic solution that could improve the sector.

We first started by estimating the amount of displays produced both by P&G and overall in Italy. After various interviews we estimated a total of 17.5 million displays per year in Italy.

The next step was to understand the environmental impact of displays as of now: in order to do so we made a Life-Cycle Assessment, a tool that calculates all the pollutants created in a product life-cycle. We discovered that currently most displays are made of recyclable materials, but they are not recycled by stores due to long disassembly times: displays are designed to impress the customer more than to be easily handled. Correct recycling would bring their national environmental impact from 13 to 5 million kg of CO₂.

We then proceeded with our solution. First, we improved the highest selling P&G display in order to make its disassembly easier: we removed redundant plastic rivets and replaced them with cardboard joints, cutting both disassembly times and economic costs (with up to 200.000€ of savings yearly). Then, we designed a checklist in which display producers can test their displays performance. The checklist controls both environmental impact and features that can reduce handling disadvantages for store clerks. The aim is for big companies like P&G to only adopt displays that have high performance scores.

Finally, we tested our solution with a theoretical pilot with Coop, investigating the effects of our solution on their stores: if adopted by all display producers, time savings and better recycling would result in 590.000€ of yearly savings.

Key Words

#GoodsDisplay #Recycling #P&G #NEDprotocol
#AltaScuolaPolitecnica #LifeCycleAssessment
#GrandeDistribuzioneOrganizzata



Francesco Luigi Milone,
Management
Engineering,
Politecnico di Torino



Francesca Eleonora Vigna,
Industrial Production
and Technological
Innovation
Engineering,
Politecnico di Torino



Chiara Perri,
Industrial Production
and Technological
Innovation
Engineering,
Politecnico di Torino



Jin Zhu,
Systemic Design,
Politecnico di Torino





**A change is coming...
want to be part of it?**



Website link



**Project description
written by the
Principal Academic
Tutor**

Much has been said about the need for societies to reduce resource consumption. Recent estimates of human appropriation of the net primary productivity of nature range from 20% to 34%; there is continued extraction of virgin minerals and ores due to linear material use patterns; moreover, energy inputs are predominantly supplied by non-renewable fossil resources. Increasing resource consumption has brought with it the global rise of a middle class; however, this has also led to an increasing waste generation. These events have continued in lockstep with economic growth since the dawn of the industrial age. One such challenge is the conservation of natural resources, defined as the minimization of consumption of renewable or non-renewable resources. Resource conservation may be achieved through waste prevention, waste reuse or recovery. The main phases of the projects were as follow:

- State of the art analysis regarding the current sales model and processes for goods displays;
- Interactions with multiple counterparts representing the 'end to end', such as:
 - the packing material suppliers for the displays;
 - the different Procter & Gamble (P&G) key resources (Sales Department, Customization Operation team);
 - the Customers;
 - the 3rd Party Logistic for the Integrated Ecological solutions.
- Development of a Life Cycle Assessment (LCA) in order to identify the potential environmental benefits;
- Creation of a tool to assess the 'sustainability' level of goods displays;
- Assessment of project feasibility through the development of a theoretical pilot;
- Design a solution (technical and process solution) with multiple decision makers;
- Development of a marketing campaign to promote the proposed solution.

Therefore, the main results of the project were:

- the definition of a circular supply-chain for the goods-displays and the process to assess its sustainability;
- the identification of a suitable goods display structure.

**Team description by
skill**

Due to the complexity of the project, the skills we applied were various. Indeed, in order to satisfy all the stakeholders, it has been necessary to merge Product Design with Environment Evaluation and Management skills. The first ones have been used to find the optimal display, the second one to assess the impact of our protocol on the environment and the last one to build a business case and prove the feasibility.

Goal

The Point of Purchase sector is not strategically important for all the actors of its value chain: consumer goods Companies, displays' manufacturers, retailers and recyclers. For this reason, the first moral goal that we decided to accomplish is to shed a light upon this topic showing the economic and environmental impact that a careful attention on POP Display can lead.

The project has to accomplish several goals that cover all the matters regarding displays. These goals are:

- Identification of the parameters that determine the sustainability of a goods display, based on the EU and Italian current regulations;
- Definition of a solution in terms of product design and/or process which could satisfy the needs of the stakeholders described above;
- Evaluation of the identified solutions in terms of environmental and marketing impact.

Due to the complexity of these objectives, the project has been organized in several milestones that all together result in the project scope:

1. Market Size Estimate: calculation of the total number of displays circulating in Italy per year;
2. Estimate the Environmental Impact through a LCA by comparing a bad waste management with a virtuous one;
3. Create a software that evaluates the display compliance to our green strategy;
4. Create a POP Display compliant with our strategy and a set of use specification easily replicable by all value chain actors.
5. Test the effectiveness of solution performing a business case in store;
6. Finalize the project by creating a marketing campaign that promotes the benefits for all the stakeholders.

Understanding the problem

The Fast Moving Consumer Goods (FMCG) companies face one of their greatest battles within stores. The Point-of-sale goods displays are a powerful marketing tool to stand out from the crowd. Therefore, they need to be replaced every two weeks approximately. This is in contrast with the increasing concern regarding resources constraints and soil contamination. In fact, most of the temporary displays at the end of their lives are thrown away in the generic bin, without separating the different materials to allow recycling. This activity should be performed by the store operators, who usually skip this operation blaming the difficulty of disassembly. On the other hand, the goods displays producers have no incentive to reduce the complexity of their products and need to fulfill the marketing requests in terms of attractiveness and appealing to the customers.

The environmental regulation is becoming stricter and stricter, although no specific law exists for the goods-displays production and disposal so far. However, the gap is expected to be filled in the near future. Moreover, countries typically buying wastes from European countries, i.e. China and India, are reducing the level of impurity accepted in the recycled material. As a result, the quality of the waste should be as pure as possible, leading to the need for a more effective recycling system.

The actors of the goods-displays supply chain should be prepared to these types of disruption in the market.

The sector of POS displays is usually not seen as strategic by the goods producers and the GDO. As a matter of fact, there is no comprehensive case study on this topic in the literature in Italy.

The Zegodi project made for the first time an estimation of the problem. The study obtained a number equal to 17 million for the number of temporary goods displays produced per year in Italy.

Exploring the opportunities

Due to the lack of a standard process end to end and big room for improvement, the team explored several opportunities to find the best solution suitable for this business and environmental case.

First, we faced the choice between reuse and recycle. On one hand, reuse would have had higher impact allowing a reduction from 5 to 3 million kg of CO₂, compared to recycling, but on the other, the setbacks were many: limited material choice, reduced appeal and attractiveness.

In this context, different stakeholders and departments had very divergent points of view and demands. On one side the need of addressing the problem, reducing CO₂ emissions and wastes leading to better results both economically and environmentally speaking. On the other side, in many cases goods displays are still perceived only as marketing tools and their production is totally design oriented.

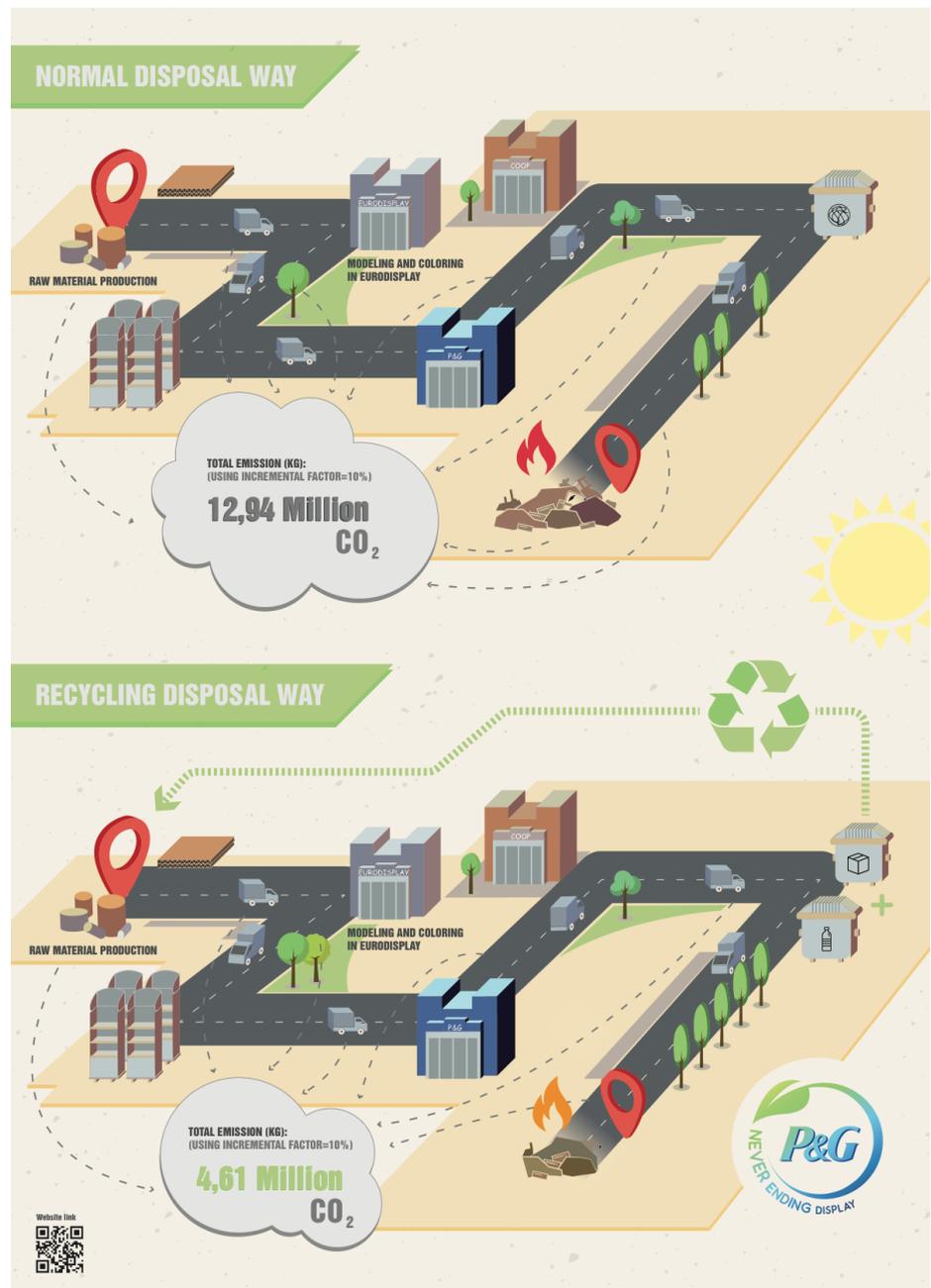
Therefore, even if at the beginning we wanted to focus on the radical solution of reuse, we decided to start step by step, bringing added value with a recycle oriented solution.

In the end, we agreed, under advice of our tutors, that this was the right direction for our project; today's society is not ready yet for such a strong change of paradigm and a big improvement can be already achieved with the usage of certain solutions.

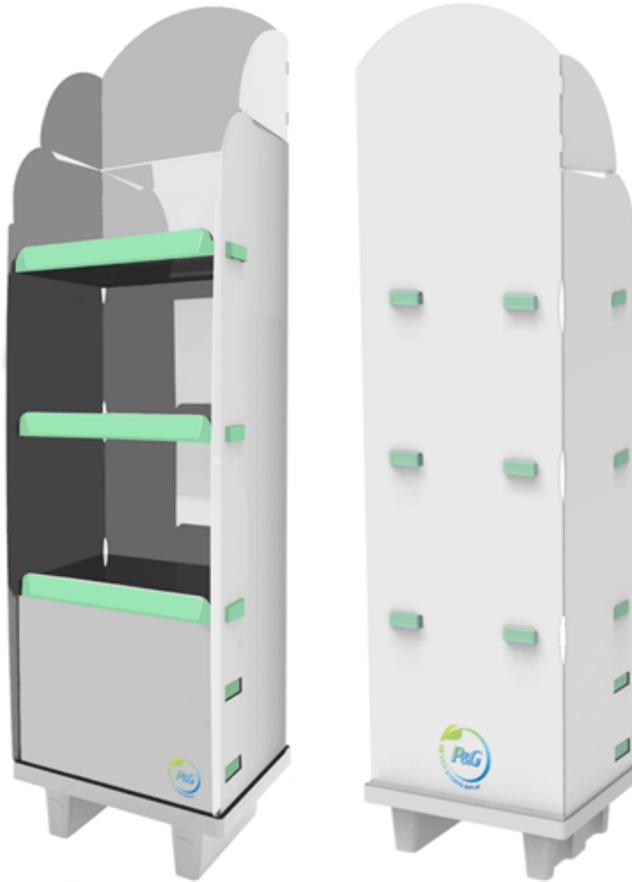
Generating a solution

The first big achievement is that, like never before, the issue has been addressed and quantified. Indeed, the team made an estimation of 17 million of temporary goods displays produced per year just in the Italian market (6,470,000 km travelled by car, or 12,940,000 usages of the dishwasher). Therefore, it can be easily understood that the amount is massive and that the problem needs to be managed quickly and wisely.

For the first time in literature, the impact of the goods displays supply chain has been estimated in CO₂ equivalent, thanks to the usage of Life Cycle Assessment. By the examination of different situations and case studies, we found out that the majority of goods displays used in our country are built with recyclable materials, but that in the end they are not recycled because of long time of disassemble and wrong habits. Thanks to the LCA tool, it was estimated that, if all the displays were recycled, their impact would decrease from 13 to 5 million kg of CO₂ produced.



Furthermore, a product-based solution was developed to simplify goods display already used in P&G' disassembly. Indeed, the junctions which connect the footer to the body of the display, were replaced by a system similar to pizza cardboard holes. In this way, both the BOM of the display and the required time for disassemble are reduced, promoting displays recycle and leading up to 200.000€ of savings yearly.



Moreover, the team designed a checklist to be used in order to define if a display can be considered sustainable or not. The criteria used have been elaborated together with our external partners, Eurodisplay and BozSei. The outcome allowed the company to assess all the displays in order to promote only the compliant ones to the NED protocol (developed by Eurodisplay with the aim of setting a standard in POP displays' recyclability).



Does your display adhere to the NED protocol?

SUPPLIER CODE _____

PROJECT NAME _____

DISPLAY SIZE WHEN ASSEMBLED _____ m³

DISPLAY SIZE WHEN UNASSEMBLED _____ m³

EMISSION EVALUATION

(Please select yes or no for each material listed below used in your display; for every yes, insert the weight in kilos and the percentage of recycled material used.)

	% of recycled	Weight (kg)	
Cardboard	<input type="radio"/> Yes		<input type="radio"/> No
PS	<input type="radio"/> Yes		<input type="radio"/> No
PP	<input type="radio"/> Yes		<input type="radio"/> No
PET	<input type="radio"/> Yes		<input type="radio"/> No
PETG	<input type="radio"/> Yes		<input type="radio"/> No
PU	<input type="radio"/> Yes		<input type="radio"/> No
Nylon	<input type="radio"/> Yes		<input type="radio"/> No
Wood	<input type="radio"/> Yes		<input type="radio"/> No
Aluminium	<input type="radio"/> Yes		<input type="radio"/> No



NED protocol

NECESSARY CONDITIONS

Does your display contain plastified cardboard?
 Yes No

Does your display contain coupled materials?
(i.e. cardboard/plastic, plastic/metal, cardboard/wood)
 Yes No

Does your display have permanent links?
 Yes No

FEATURES

Do you use hot melt for your display?
 Yes No

Do you use sustainable inks for your display?
 Yes No

Are the single components of your display stackable when disassembled?
 Yes No

What's the mean time to assemble your display in the plant?
 _____ Seconds

What's the mean time to disassemble your display?
 _____ Seconds



RESULTS

	Score	out of
Use of plastified cardboard	/	-
Presence of coupled materials	/	-
Disassemblability	/	-
Emissions	/	20
Recyclability	/	20
Use of hot melt <i>(sustainable or not)</i>	/	10
Use of sustainable inks	/	10
Stackability of components	/	10
Mean time to assemble	/	15
Mean time to disassemble	/	15
Total score		
Compliance to NED protocol <input type="radio"/> Yes <input type="radio"/> No		

Benchmark emissions for 10 trucks worth of displays are **23831.40** kg of CO₂.

Your emissions for 10 trucks worth of displays are _____ kg of CO₂.

You could save _____ kg of CO₂ every 10 trucks by switching to all recycled materials.

In the end, the combination of our solutions and ideas can certainly make the difference in this field and, to prove that, the team developed a theoretical pilot with COOP Alleanza 3.0. The results show that, if the NED protocol would have been applied to all the displays of this retailer, it could have saved 590.000€ yearly, plus advantages in terms of social and environmental awareness and corporate responsibility.

Main bibliographic references

- Gazzetta ufficiale (2004). Direttiva 2004/12/CE del Parlamento Europeo e del consiglio dell'11 febbraio 2004. *EUR-Lex*. Retrieved on: https://eur-lex.europa.eu/resource.html?uri=cellar:f8128bcf-ee21-4b9c-b506-e0eaf56868e6.0008.02/DOC_1&format=PDF
- Bosetti e Gatti (2006). Decreto legislativo 3 aprile 2006. *Bosetti e Gatti website*. Retrieved on: http://www.bosettiegatti.eu/info/norme/statali/2006_0152.htm.
- European Commission (2018). Plastic waste: a European strategy to protect the planet, defend our citizens and empower our industries. *European Commission website*. http://europa.eu/rapid/press-release_IP-18-5_en.htm
- Angelico and Pujari (2010). Mainstreaming green product innovation: why and how companies integrate environmental sustainability. *Journal of Business Ethics*. Retrieved on: https://www.jamk.fi/globalassets/koulutus--education/liiketalouden-ala/yamk_yrittajyyden-ja-liiketoimintaosaamisen-koulutusohjelma-yamk/mainstreaming-green-product-innovation_dangelico-and-pujari---2010.pdf
- McKinsey & Co (2008). How companies think about climate change: a McKinsey global survey. *The McKinsey Quarterly February 2008*. Retrieved on: <https://www.sallan.org/pdf-docs/clch08.pdf>
- Nielsen (2018). Global consumers seek companies that care about environmental issues. *Nielses.com*. Retrieved on: <https://www.nielsen.com/eu/en/insights/article/2018/global-consumers-seek-companies-that-care-about-environmental-issues/>
- Eurodisplay (2019). Who is Eurodisplay. *Eurodisplay website*. Retrieved on: <http://eurodisplay.it/it/chi-siamo.aspx>
- P&G (2019). Our functions. *P&G website*. Retrieved on: https://www.pg.com/vn/careers/our_functions/marketing.shtml
- Newell, G. (n.a.). The New Marketing Trend Driving P&G Marketing and Unilever Marketing. *602Communications*. Retrieved on: <http://602communications.com/the-new-marketing-trend-driving-pg-marketing-and-unilever-marketing/>
- Smithson, N. (2018). Procter & Gamble's Organizational Structure for Managing Products. *Panmore Institute Website*. Retrieved on: <http://panmore.com/procter-gamble-organizational-structure-managing-products>
- P&G (2019). I nostri punti di forza. *P&G website*. Retrieved on: https://www.pg.com/it_IT/azienda/visione-e-strategia.shtml
- Treccani (2012). Dizionario - Lessico del XXI Secolo. *Treccani website*. Retrieved on: http://www.treccani.it/enciclopedia/gdo_%28Lessico-del-XXI-Secolo%29/
- La Repubblica (2018). Supermercati, crescono le vendite ma decrescono i margini. Economia e Finanza, *La Repubblica*. Retrieved on: https://www.repubblica.it/economia/rapporti/osservazioni/italia/mercati/2018/12/19/news/supermercati_crescono_le_vendite_ma_scendono_i_margini_il_mercato_verso_la_saturazione-214611537/?refresh_ce
- Il Sole 24 Ore (2018). La Cina blocca l'import di rifiuti, caos riciclo in Europa. *Il Sole 24 Ore*. Retrieved on: <https://www.ilsole24ore.com/art/la-cina-blocca-l-import-rifiuti-caos-riciclo-europa-AELQpUhd>

- Comieco (2019). Our Activity. *Comieco website*. Retrieved on: <http://www.comieco.org/la-nostra-attivita/osservatorio-prezzi/Default.aspx?anni=2019&mesi=6>
- P&G (2019). Purpose, value and principles. *P&G website*. Retrieved on: <https://en-ae.pg.com/policies-and-practices/purpose-values-and-principles/>
- Boutilier (2011). A stakeholder approach to issues management (Strategic Management Collection). *Business Expert Press*.
- Matamalas and Ramos (2009). Marketing strategy of the supermarkets.
- Kerfoot (2003). Visual merchandising and the creation of discernible retail brands. *International Journal of Retail and Distribution Management*.
- Conai (2016). Futuro comune: Innovazione, bellezza, sostenibilità. *Conai website*. Retrieved on: http://www.conai.org/wp-content/uploads/2014/09/CONAI_Futuro_Comune_def.pdf
- P&G (2018). P&G Announces New Environmental Sustainability Goals Focused on Enabling and Inspiring Positive Impact in the World. *P&G Website*. Retrieved on: <https://news.pg.com/press-release/pg-announces-new-environmental-sustainability-goals-focused-enabling-and-inspiring-pos>.
- Proteus Smart Display (2019). About Proteus. *Proteus website*. Retrieved on: <https://proteussmartdisplay.com/about-us/>
- Display Magazine (2019). Never Ending Display: l'espositore riciclabile lungo tutta la filiera. *Display Magazine*. Retrieved on: <https://www.displaymagazine.eu/never-ending-display-lespositore-riciclabile-lungo-tutta-la-filiera/>
- EC - JRC (2010). ILCD Handbook: General guide for Life Cycle Assessment - Detailed Guidance. *EC - JRC website*. Retrieved on: <https://eplca.jrc.ec.europa.eu/uploads/ILCD-Handbook-General-guide-for-LCA-DETAILED-GUIDANCE-12March2010-ISBN-fin-v1.0-EN.pdf>
- Grosso, M. and Rigamonti, L. (n.a.), Life-Cycle Assessment (LCA): General characteristics and application to waste management. *Politecnico di Milano*.
- Rigamonti, L. (n.a.) LCA: introduction. *Politecnico di Milano*.
- Muralikrishna, I. and Manickam, V. (2017), Environmental Management. *Elsevier Inc*. Retrieved on: <https://www.sciencedirect.com/book/9780128119891/environmental-management>
- Grosso, M. and Rigamonti, L. (n.a.), LIFE CYCLE ASSESSMENT (LCA): General characteristics and application to waste management. *Politecnico di Milano*.
- Rigamonti, L. and Grosso, M. (2009), Riciclo dei rifiuti. *Dario Flaccovio Editore*.
- Rigamonti, L. and Grosso, M. (2009), Riciclo dei rifiuti. *Dario Flaccovio Editore*.
- Rigamonti, L. and Grosso, M. (2009), Riciclo dei rifiuti. *Dario Flaccovio Editore*.
- K.Xue. (2013). Analysis on the Structural Performance of Traditional Chinese Furniture and Design Improvement of Mortise and Tenon Joint. Retrieved on: <http://kreader.cnki.net/Kreader/CatalogViewPage.aspx?dbCode=cdmd&filename=1013045817.nh&tablename=CDFD1214&compose=&first=1&uid=>