



## RENAULT VEHICLES AND THEIR PROGRESS REGARDING THE REDUCING OF ENVIRONMENTAL FOOTPRINT

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**Abstract:** One of the major world ecological challenges is to reduce the environmental impact of the activity and products throughout their life cycle. Renault, 4<sup>th</sup> company in the automotive industry, has its environmental policy which makes the company more efficient and competitive. This policy is focused on following priorities: climate change and energy efficiency, resources and competitive circular economy, health and ecosystem, innovative mobility systems and environmental management and transparency.

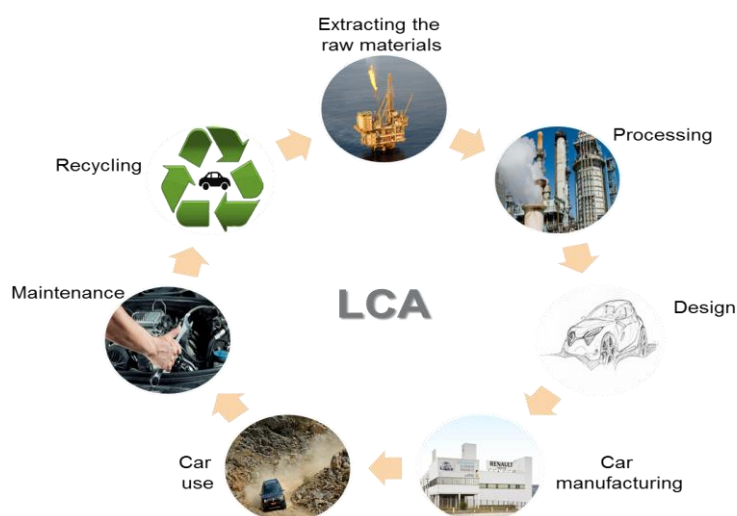
Today, Renault vehicles are design to be at least 85% recyclable, integrating already parts based on recycled materials. For Europeans customers, the ECO2 label show that the Renault and Dacia vehicles have best environmental credentials and are the most economical to drive.

**Keywords:** environment footprint, recycling materials, renewable sources, automotive

### 1. INTRODUCTION

Automotive industrial processes and products present an important impact on health and environment. In order to manage these impacts, each vehicle producer makes big efforts to develop and to implement their own Environment Policy, according to worldwide environmental assessments and regulations [1].

Renault, 4<sup>th</sup> company in the automotive industry, has its environmental policy which makes the company more efficient and competitive. This policy is focused on following priorities: climate change and energy efficiency, resources and competitive circular economy, health and ecosystem, innovative mobility systems and environmental management and transparency. The worldwide network extended to all levels is used to implement and to monitor the respect of the Renault Environmental Policy.



**Figure 1.** Schema of LCA method in automotive

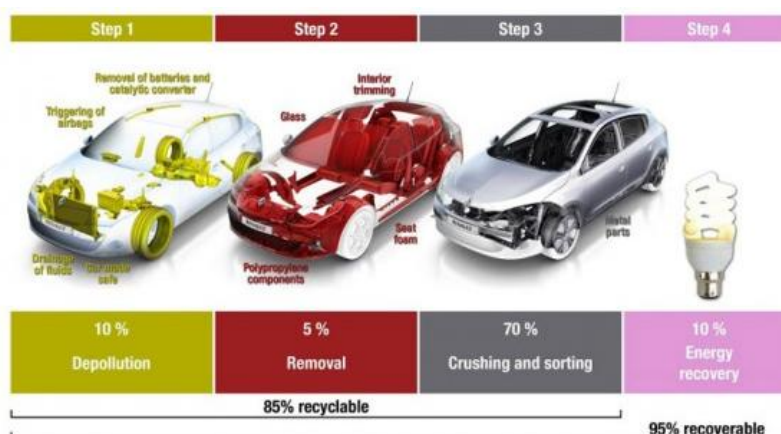
The most worldwide used methodology to measure the environmental footprint of processes, products and services is Life Cycle Analysis (LCA). By this method, according to the ISO 14040 standard, are evaluated all manufacturing phases, from obtaining the raw materials to possible re-use or recycling of the product and its eventual disposal (Figure 1) [1].

Renault use Life Cycle Analysis (LCA) in order to measure our environmental progress from one vehicle generation to the next (e.g. Renault Clio - Figure 2).



**Figure 2.** Decrease of the environmental impact during the car model evolution

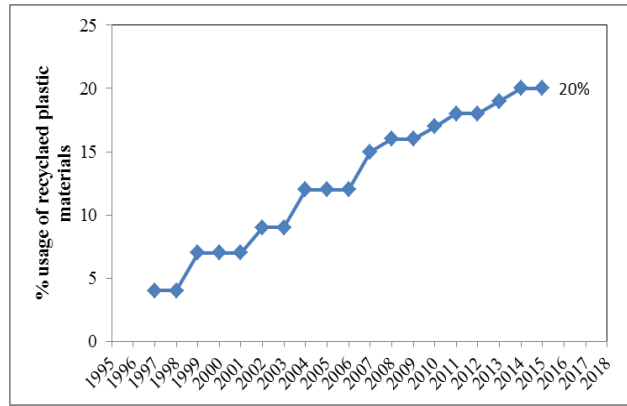
In the present, Renault vehicles are design to be at least 85% recyclable, integrating already parts based on recycled materials (Figure 3). For Europeans customers, the ECO2 label show that the Renault and Dacia vehicles have best environmental credentials and are the most economical to drive.



**Figure 3.** Recycling process at the car end life

## 2. RECYCLING PLASTIC MATERIALS USED IN RENAULT VEHICLES

As early as the 1990s, Renault led the way on the use of recycled plastics on its vehicles. Starting with launch of Clio in 1996 (first vehicle with recycled plastic materials parts – wheel housing liner), Renault has been carrying out an important recycling policy, increasing each year the amount of the used recycled plastic materials from 4 kg to more than 32 kg (Renault Laguna). The current objective of the company is to have 20 % of recycled plastic materials on new vehicles by 2016 [2].



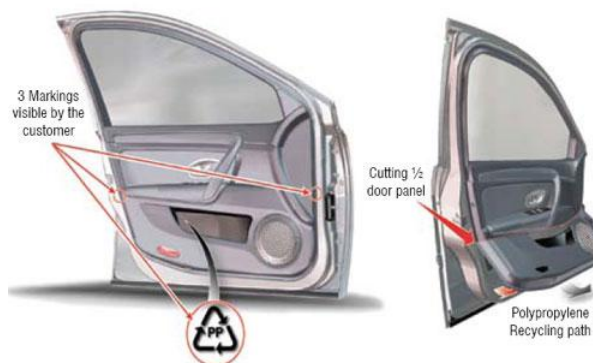
**Figure 4.** Evolution of the recycled materials used on Renault cars

Recycled materials are usually perceived as being a second choice when engineers start to design a certain vehicle part. However, it was showed that a well-recycled material can provide good results regarding the properties of the recycled material in comparison with original material. The potential of the recycled materials was highlighted when decorative parts were made from recycled plastic (Renault Megane), having no differences to the customers regarding the quality and functionality.



**Figure 5.** Parts in recyclable and renewable plastic material for Renault Megane vehicle

Renault Group funded research projects in order to develop recycling processes, especially for plastic materials. The most used plastic in Renault vehicles is polypropylene (PP). For this type of material Renault develop design guidance tools in order to prevent the pollution of the polypropylene with parasite polymers of equal density and incompatible materials present into the polypropylene process (PVC, glued textiles, metallic inserts etc.). A reference part is the door panel from Renault Laguna. To make it easier to recycle, engineers worked to the extent that all of its elements (speaker covers, shock absorbers etc.) located in the lower part of the panel be made entirely of polypropylene. Recyclers can cut along the visible markings to recover and recycle more than 1.5 kilograms of matter per panel. This innovation has been patented and is visible to our customers, thanks to the affixing of the conventional logo to symbolize this recycling [2].



**Figure 6.** Renault Laguna III panel door trim

### **3. CONCLUSION**

Looking beyond economic considerations, Renault uses the circular economy to shrink the environmental footprint of its products and activities. Working on the entire life cycle of its vehicles – and in particular by reducing CO<sub>2</sub> emissions – the Renault group leads an ambitious policy on the reduction of its environmental footprint.

The ECO2 label is based on Renault environmental policy and highlights the three key stages of the vehicle life cycle: manufacturing – vehicles produced in ISO 14001 certified plants, utilization – vehicles emitting less than 120g of CO<sub>2</sub> / km and recycling – at least 85% of the car must be recyclable.

### **REFERENCES**

- [1] Hashmi S. (Editor-in-chief), *Comprehensive Materials Processing*, Elsevier, 2014
- [2] Abraham F., *Design to recycling – The Renault way*, Autofocus Asia, 2013