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 WS-REC

DESIGN AND CONSTRUCTION OF A ELV-WINDSCREEN RECYCLING LINE

Deliverable D.7.4.

Visits of potential clients

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Dissemination Level		
PU	Public	✓
PP	Restricted to other programme participants (including the Commission Services)	
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CO	Confidential, only for member of the consortium (including the Commission Services)	

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1. Objective of the market analysis

The main objective of the deliverable D7.4 “Visits of potential clients” is to study, identify and contact with the main interested parties of the products to be developed in the WS-REC project. The market of PVB involves not only manufacturers but also end-users of different industries.

Despite the fact that almost all the manufactured PVB is used in the laminated glass industry, both for construction and windshields manufacturing, there are currently arising new industries which has also expressed their interest in the PVB.

A part from the main PVB consumers, there also other companies interested in the recycling process. These companies are mainly waste managers as well as companies which repairs and substitutes windscreens from vehicles.

In conclusion, the market analysis will be focused on six groups:

- Manufacturers of PVB
- Providers of windscreens: scrap yards, replacements garages, among others.
- Waste management companies such as glass recovery companies, plastic recycling companies, among others.
- Laminated glass Manufacturers
- Competitors
- Substitute products: products available on the market and compete in the PVB market.
- Companies interested in recycled PVB (different to windscreens manufacturers)

2. PVB manufacturers

The main PVB manufacturers at global level are described below. These PVB is then used in the manufacturing of laminated glass for windscreens or construction. These manufacturing companies could be considered as competitors of the recycled PVB. However, they could also be considered as possible customers since they could offer PVB mixtures, reducing the costs of the final product.

DuPont (Willmington, Delaware U.S.A.), leading provider of polyvinyl butyral (PVB) for laminated glass, founded in 1802. In 1938, the resin PVB was introduced on market labelled as Butacite. It is the only manufacturer which offers PVB films of high quality as virgin resin (Butacite®) or with 100% recycled materials (Butacite®G).

Solutia (St. Louis, Missouri USA), company with head office in Unites States, but with more than 50 facilities on the five continents. In 1940, PVB resin was introduced in the market, registered as Saflex®. Its market is focused on Asia Pacific region, due to the increasing demand of vehicles, mainly in Chine. At European level, the Solutia plant located in Ghent (Belgium) manufactures one million square meters of PVB for laminated glass, which is sold under the Saflex brand.

Kuraray Co Ltd., (with headquarters in Tokyo, Japan), group that was founded in 1926 and which main European offices are located in Frankfort, Germany. Its product was registered with brand Trosifol®, laminated PVB for applications in windscreens.

Sekisui Chemical Co, Ltd (Kyoto, Japan), was founded in 1947, with brand SLec™ for PVB film for windscreens. It counts with offices all around the world.

Zhejiang Pulijin Plastic CO (China), a professional PVB film manufacturer and seller in China, is specialized in PVB film with all kinds of colors and sizes, committing to research, development, production and marketing at an organic whole.

3. Windscreens Providers

There is a wide diversity of companies that could provide PVB contaminated with glass. On the one hand, companies which generate waste windshields, such as scrap yards, repairing and replacing windshields companies, among others, are considered important providers. These companies are considered as material suppliers for the PVB recycling line. Currently, windscreens from scrapping or garages are disposed in landfills or glass recycling centres. Nowadays, there is an important need to collect and recycle PVB, since up to 480.000 tons per year are collected in Europe from end of life vehicles.

Apart from the companies related to the windshields management, there also different companies which manage wastes of laminated glass, mainly due to their interest in the recovery of glass. As a result of their process, these glass recovery companies produce huge amounts of contaminated PVB as waste.

The companies classified as PVB providers and who have been contacted or have expressed their interest in the line are the following ones:

Carglass® is the company leader in repair and replacement of windscreens from vehicles in Spain and it serves to more than 350.000 drivers every year. To hire their services, you could go directly to their centres or apply for mobile serving. The replacement and repair of the windscreens are guaranteed by life, and in the case of repair, optical satisfaction is guaranteed for a period of three months. They offer a close relationship with the main insurances companies facilitating the management of the procedures.

Cristalbox is specialist in the replacement of any component of glass, both in cars and industrial vehicles. The replacement time required is minimal, because they use new generation polyurethane adhesives which dry four times faster than conventional adhesives. They have a central storage system to ensure a permanent stock in less than 24 hours.

GUARDIAN EXPRESS is a garage repair chain of windscreens belong to Guardian Industries (windscreens manufacturer), with garages all over the country. The advantages are quality, national coverage, mobile unit which can repair anywhere and, of course, its stock of windshields because it is also manufacturer of windscreens.

SERVI PARABRISAS are specialists on the repair or replacement of windscreens. They ensure a repair in only 30 minutes or a replacement of the windscreen. Some garages are located in Alcobendas, Alcorcón, Coslada, Fuenlabrada, Leganés, Humanes, Madrid, Móstoles, Parla, Pinto, Pozuelo de Alarcón y San Fernando de Henares.

EL PARABRISAS is a company dedicated to repair and replace windscreens, as well as sale and install a variety of car accessories, with an extensive sector experience and highly qualified employees. They distribute the best brands of the glass automotive market and their efficiency is ensured in all type of vehicles: trucks, buses, vans and cars in general. Garages are located in provinces of Orense and Pontevedra.

AUTO CRISTAL REPAIR GROUP began its career in the field of automotive glass assembly (cars, vans and trucks) in the early 90's, reaching a market share that from that was not represented in sector, with a service policy focused on and characterized for its quick and efficient management of the assembly procedure. (Reducing waiting times). Some garages which provide services are in the provinces of: Sevilla, Málaga, Cádiz and Huelva.

GLASS POINT GROUP was constituted by a chain of independent garages specialized in repairing and replacing all types of windscreens, operating under the same brand, rules and procedures, and providing coverage in several places of the country. Provide a complete service, efficient and with guarantee to insurance and leasing companies, providing the highest quality to its customers, as little businesses. The PVB to be purified providers are those companies called Glass recyclers. These companies succeed to separate PVB and glass from windshields, but they don't complete the PVB recycle process. The management of these companies looks forward to getting to the process the maximum amount of glass including any waste that comes with it, minimizing the waste dispose in landfills. In this area, it could be found a good partnership to obtain PVB to be purified, the PVB recycling line could be the end point of the recycling process. There are several glass recovery companies distributed across the country, but not all these companies process laminated glass. The study is focused on those companies which process laminated glass, and they are enumerated below:

Asociación Navarra de Talleres is a non-profit association, which aims to represent, support, improve and promote the professional interests of members, for example to ensure professionalism, Sector competitiveness and prestige to users and society in general.

Metal Navarra SA is a family company founded in 1986 dedicated to the management of industrial waste. Medenasa performs the collection, sorting and processing of scrap, both ferrous and non-ferrous and subsequent sale to steel mills and foundries.

Glass Talleres is the leader in its sector, having the most extensive network of specialized in replacing windscreens.

Autocrystal Ralarsa has always been a company linked to the automobile sector, and it has been specifically dedicated to vehicle glass since 1985. RALARSA pioneered the development of a nationwide network of centres specialised in vehicle glass, which had been nonexistent until then, and has been definitively marking the modernisation of the sector, right up to the present.

Bestern International Trade (China) is a manufacturer of laminated glass, template glass, insulating glass, reflective glass, among others.

Tianjin Sunrise Industrial Co. Ltd, is a deep-processed glass manufacturer, located in Tianjin, one of the four directly governed city region of China. Sunrise high-quality mirrors have been well approved by customers around the world wild .All of our products are strictly manufactured according to ISO9001 inspection, mainly items including glass and mirror, such as aluminium mirror& silver mirrors, rear-view mirror & side-view mirror, mirrors with polished edge, mirrors with bevel, and mirrors with safety-backing, etc.

4. Waste management companies

There is currently a wide range of waste management companies specialized in recovery specific materials from different wastes. However, in their processes there are still big amounts of wastes. For example, during the project execution we showed that there are already a wide number of companies which main working activity is the recovery of glass from laminated glass, thus, an already existing market. Some examples of contacts made, are as follows:

SANTAOLALLA E HIJOS S.A is a company located in Burgos a Quer (Guadalajara, Spain) which main activity is related to the treatment and recovery of glass.

GONZALO MATEO S.L., since its foundation, it manages and provides services to multiple enterprises which generate industrial waste glass (glassware, bottling plants, scrap yards, etc...) across the country, providing in each case, the most appropriate type of container from 1 to 40 cubic meters.

SANTOS JORGE S.A. is a company committed with environment, with more than 55 years in the sector. The productive capacity of its facilities is 500.000 tons of glass per year. It produces more than 30 different products in its facilities. This range of products are determined by its clients: topaz, white, extra clear, green, mixed, coloured glass, white glass, green glass, mirror, laminated and armed.

RECUPERADORA DE VIDRIO DE BARCELONA, S.A. (REVIBASA) is a Company specialized in the recycling of all types of glass from containers to flat glass. The glasses accepted in REVIBASA are: mixed green glass, white glass, brown glass, colour glass, white glass, mirror glass, extra clear glass, glass laminate, double glazing, safety glass, windshields and special glasses.

RECUPERACIÓN Y RECICLAJE DE VIDRIO S.L.- FUENLABRADA is a company located in Madrid, Spain, specialized in the collection, reception, classification and management of all types of waste glass, either hollow glass (bottles) or flat glass, and the destruction of any type of obsolete glass (no longer in use). Provides services for removal and management of waste glass in containers (from 0,1 m³ to 30 m³) to all types of companies or entities that produce this waste (hollow glass: packing plants, distribution companies of food, hospitality – restaurants, bars, cafes, clubs, hotels, and pharmaceutical laboratories, composting plants, plant classification, collection of municipalities, recycling centres, etc...; flat glass: warehouse, double and safety glass manufacturers, locksmiths and carpenters – iron, aluminium, PVC or wood – manufacturing garages, furniture factories, construction companies, rehabilitation and demolition, windscreens, etc...). To other types of waste, included recyclable or

recoverable wastes (paper and cardboard, plastic, ferrous and non-ferrous metals, pallets, etc...), it counts with collaboration agreements with other companies and managers authorized from Madrid.

CAMACHO RECYCLING S.L. is a family Company, from Madrid, pioneers in glass reuse and recycling of all types of glass. The treatment volume of waste glass is more than 130.000 ton/year. Although at the beginning, all the collected glass was intended to reuse and to fusion for the manufacture of new packaging, at the moment, there are multiple market sectors where recycled glass could be introduced, such as Coating vitreous, crafts, blasting, microspheres, flooring, compact quartz, etc. Its purpose is to achieve “Zero Waste”, so it will take into account a part form glass, any other waste that comes with it, minimizing the waste dispose at landfill.

Ecoiruña is a company with over 40 years of experience in the collection of industrial waste. Its activities include the recycling of all materials.

Recuperadores de Vidrio Aguado e Hijos, SL is a company which recovery glass from different wastes.

SPRV Industriels (France) was founded in 2001 and specializes in the recycling of flat glass and glass bottle white, with a processing capacity of 50,000 tons per year at the site of Chateaubernard (Cognac).

Mediterraneo Recycling SL, located in Spain, is a company which manages the wastes of different companies which develops big amounts of glass wastes in their processes.

Caoensa World Recycling (Spain) is a company with a wide experience in commercialising any recoverable waste.

Maltha- Van Gansewinkel Group- (Netherlands)- Maltha is a leading processor of packaging and flat glass in Europe. Each year we process more than 1 million tonnes of glass waste from companies, citizens and municipalities into high-quality new raw materials for use in making new products.

Bonnelevidrios located in Brasil, is a company specialized in the Glass Waste management.

Martini SRL, from Italy, works on the recovery of glass from different waste sources such as industrial wastes, commercial wastes or domestic wastes.

5. Laminated glass manufacturers

Another interested party are the laminated glass manufacturers which require PVB as raw material and can be interested in a new market of recycled PVB.

The leading manufacturers of laminated glass for windshields are:

SAINT GOBAIN GLASS (Saint-Gobain Sekurit) is an international organization which includes all activities related with glass to construction in all countries, with the single brand “Saint Gobain Glass”. It is one of the main glass manufacturers in Europe, ranking the second place worldwide.

This company has three production centers in the Peninsula, in Aviles and Renedo (Cantabria –Spain), Arboc (Catalonia – Spain) and Lisbon (Portugal); furthermore, it counts with production units (fleets) all over the world, specializing in manufacture of various types of glass, with over 300 production sites in Europe. In Spain, it is represented by the trade name “The Saint Gobain Venetian”.

In addition, next to the factory in Aviles, there is the Research and Development Center, which has an important prestige throughout Europe, because it is one of the first laboratories which studies the behavior of the glass, develops new products and it is known for its rigorous and continuous research work for more than 40 years. This agency is accredited by ENAC (National Accreditation) to perform a certain number of essays, according to ISO 17025 (September 2001).

Saint Gobain Glassware, has a society, SGG Solar Control (located in Zaragoza, Spain), specialized in the production of coated glass, template and laminated glasses, which gives a big variety of solutions to problems with solar control in walls, acoustic comfort, security and protection, thermal isolations, among others.

The specialties of this company could be divided in four important groups:

- Saint Gobain Glass, specializing on the manufacture of flat glass and the film deposition by magnetron procedure.
- Saint Gobain Glass Solutions, centers which ensure the manufacture and distribution of glass to the construction sector.
- Saint Gobain Sekurit, a leader in automotive and transport sector.
- Saint Gobain Specialties, which covers electronics, appliances, photovoltaic, commercial refrigeration, fire protection and nuclear safety.

With 40 years of engineering experience and a strong commitment to innovation, Saint Gobain Sekurit is one of the manufacturers of windcreens of leaders. They provide products and services with high added value in three markets:

- Automotive windcreens originally installed by car manufacturers (OEM).
- Spare parts for automotive windcreens.
- Windcreens to vehicles (buses, trucks, aircraft)

Saint Gobain Sekurit is a subsidiary of Saint Gobain, one of the top 100 companies in the world. Saint Gobain operates in five main sectors: flat glass, building products, performance materials, containers and distribution buildings. It is the world leader in each one of these fields.

With headquarter in Paris, Saint-Gobain has more than 200.000 employees in 56 countries and it is included on stock exchange from Paris, London, Franckfort, Zurich, Brussels and Amsterdam.

GUARDIAN INDUSTRIES was founded in Detroit in 1932, and it focuses its activities on the manufacture and processing of glass to construction, automotive and furniture. It counts with offices in the four main continents; it has become the third manufacturer of flat glass in the world. In Spain, Guardian has two production and processing glass centers, a plastic injection factory and special coatings for automotive, two national chains to replacement windscreens to cars and a complete chain of stores to distribution and marketing their products.

In relation with automotive world, Guardian is between the hundred largest suppliers to the automotive industry, one of the few companies in the world that manufacture both glass and plastic injection products for automobiles.

Guardian Industries has six factories around the world where glass is transformed to automotive: 4 in United States and 2 in Europe: Grevenmacher in Luxembourg and Llodio in Alava.

Guardian Industries manufacture about 6 million and a similar amount of tempered glass. From this quantity, approximately a 80% is used for the original equipment market and the rest for spare parts. Over 1 million of these windshields are made in Llodio, focusing up to 90% on the spare parts market, mostly in Western Europe.

Furthermore, the Guardian Express is a division with a network from more than 70 workshops throughout Spain, which are specialized in replacement and repair of windshields, which serve to 85% of national fleet.

PILKINGTON is a company dedicated to glass manufacture for construction and the automotive sector. The activities of Pilkington in Spain are located in Sagunto, near Valencia, with glass supplies to main manufacturers of vehicles in Spain. The float glass line produces approximately 150.000 tons per year.

There is Global cooperation with Asahi Glass Co, Ltd. AGC Automotive produces and markets glass from new vehicles and spare glass parts, with a higher global market with new vehicles. It has activity in Japan, Asia, Europe and North America. Through an integrated management system worldwide, with headquarters in Tokyo, working also together with Japan, Asia, Europe and North America, and ARG (replacement from automotive glass) to support their clients' activities and meet their needs in the areas of development, production and sales in the global.

Sisecam Group is an industrial group which main activity is based on the glass production and in chemical products. The group is formed by companies Trakya Cam, Cam Anadolu, Cam Denizli and Soda Sanayi.

The company Trakya Cam is the leader company of the flat glass market in Turkey and pioneer in the region. This company has the most advanced production technologies, working with the sectors of glass base (mainly for architectural applications), automotive glass for vehicles and glass for domestic applications.

In 1977, after signing a license agreement with Pilkington for the production of float glass, the company was able to implement the first production line between Eastern Europe, the Balkans, Middle East and North Africa, continuing its further expansion in Turkey and the region of Balkans. It has become one of the seven mainly companies of flat glass in the world and one of the four main companies in Europe.

In the field of automotive glass, Trakya Cam is a provider of the leading manufacturers of cars and with very good reputation in Europe, offering high quality products in its factories. Its last strategic step has been to develop its activities together with Saint Gobain, developing new companies in Egypt and Russia.

Cristales Automotrices de Jalisco, S.A- Manufacturer of windscreens for busses. The company is based on Mexico.

6. Competitors

There is little number of competitors on the PVB recycling field. According to market search developed, it could be concluded that, in general, the development of the recycled PVB line could open a new market, providing a new option for laminated glass manufacturers and a solution for the recovery of waste windshields.

The consortium has identified and contacted with few companies of the field with the objective to know their commercial product. Some of the companies are:

Ecotransformación Ambiental, SAS- Company located in Colombia. The company counts with a laminated glass miller and produces PVB. Since 2013, the company has a laminated glass recycling line which produces up to 20tonnes of glass-free PVB per month.

Delaminating Resources Pty Ltd- As part of the group Delam, which has offices both in UK and Australia, the company recycles laminated glass basing on a Patent which enables delaminating the glass and PVB between the glass pieces.

Recycling Solutions SAS (Colombia)- The main working activity of the company Recycling Solutions SAS is the recycling of a wide diversity of materials.

7. Other companies interested in the product

Zorton World (Spain)- Waste Plastics Wholesaler

Eico Specialties- This company of Italy with a wide experience in the chemistry sector, had expressed their interest on the recycled PVB.

Clarity Environmental LD (UK)- Clarity provides single source and bespoke waste management and recycling solutions. Our waste and recycling specialists offer a wide range of services for all of your waste management and recycling needs.

Bakingtray (Spain)- Manufacturer of high performances polymers such as PP and PE.

Ningbo Minte Nylon Industry (China)- ingbo Minte Nylon Industry Co., Ltd. is a company with joint venture which specializes in producing Nylon 6,6 plastics, Adipic Acid and Hexamethylene Diamine. They have four national advanced productive lines of twin screw plastic extruder and one nylon monomer productive line, which produces 8,000ton Nylon 6,6 pellet 4,000ton Adipic Acid 3,000ton Hexamethylene Diamine.

Intercontinental Export Import Inc (USA)- The business was started with the purchasing and selling of post-industrial recyclable plastics.

Qingdao Volterra Plastic&Rubber Material Import&Export Ltd (China)- Qingdao Volterra Plastic&Rubber Material Import & Export Ltd. is a professional plastic and rubber raw material manufacturer.

Dyna Mobil SA (Spain)- They are the only European manufacturer capable of providing their own, distinctive, integral response to the entire set of office components (partitions, floors, ceilings, chairs and furniture)

Delm Plastics- The company, which is based on South Africa, works on the plastic and waste rubber field, supplying material to companies all around the world.

Hevadex BVBA (Belgium)- HEVADEX bvba was founded in 2009, develops and manufactures products and solutions for the building industry; particular HEVADEX mainly produces polymer-based fluids after application dry to a film / foil with certain characteristics.

8. Summary

The market analysis has allowed the consortium to confirm that the recycling of laminated glass has a huge interest in different sectors. On the one hand, there are different companies interested on the recycling process in order to reduce the amount of wastes generated in their processes. On the other hand, there are companies interested in the recycled material, not only PVB or laminated glass manufacturers, but also companies from other industries which are interested in incorporating the recycled PVB in their products due to its properties.