



THE RECYCLED MATERIAL PRESENTATION

HANGZHOU J·BONWE YONGSHENG ADVANCED
MATERIAL CO., LTD



The global leader of changing
waste PVB(VAC) into
environmental-friendly goods



CONTENT

1

Global Environment

2

Introduction and Characteristics of PVB

3

Cyclic Utilization of RPVB(VAC)

4

GRS Certificate

5

Market Prospects of RPVB(VAC)

6

Environment Interest & Value Proposition

7

Application of RPVB(VAC)

8

100% Environmental-friendly Fabrics



PART 01

Global Environmental Status



LET'S GO GREEN

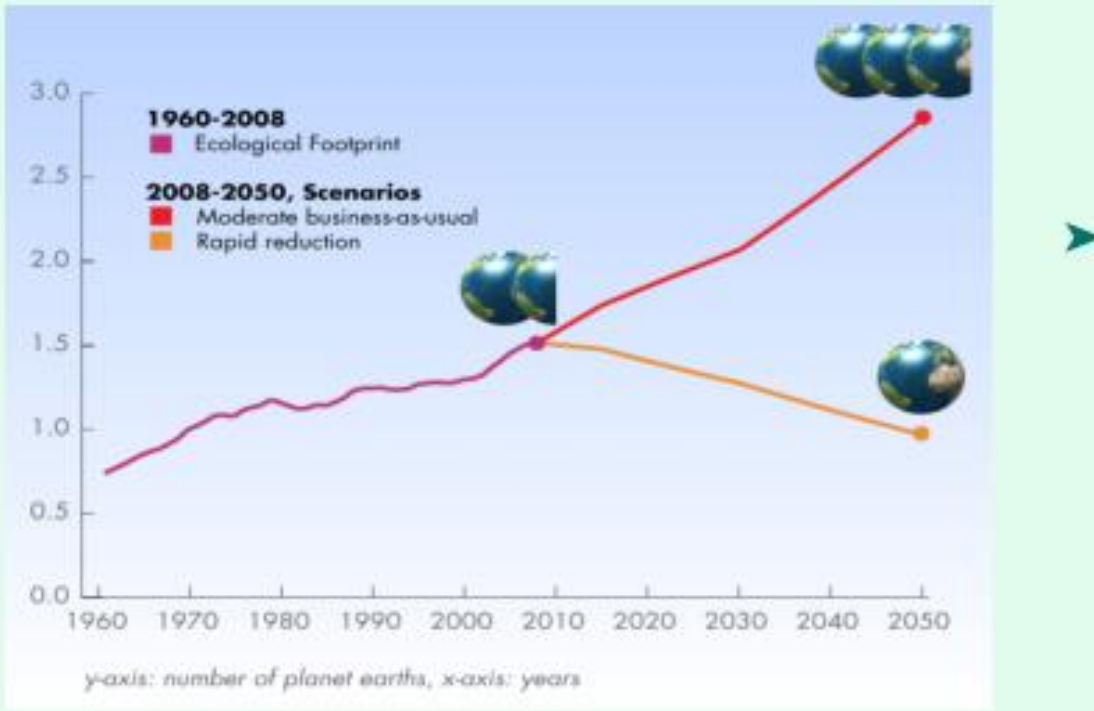




1.1 Global Environmental Status

Today the human society uses the equivalent of 1.5 planet earths providing resources and digesting wastes, meaning it takes the Earth one year and six months to compensate for the amount we use in a year.

The United Nations predicts that if the current consumption of the earth's resources by the world's population continues, we will need the equivalent of two planets to supply the resources we need for our lives by 2030. However, there is only one planet. At present, we are in excess of the earth's ecological load.





The Appalling Pollution Status



- ✓ Garbage pollutes the Ocean **particularly severely**. The Great Pacific Garbage Patch (GPGP) is the largest of the five offshore plastic accumulation zones in the world's oceans, which covers an estimated surface area of 1.6 million square kilometers.
- ✓ At the time of sampling there were more than 1.8 trillion pieces of plastic in the patch that weigh an estimated 80,000 tonnes. This kind of garbage has caused more than 260 marine species to eat and entangle by mistake. In addition to environmental impacts, toxic substances entering our biological chain will further affect human health.
- ✓ Statistic data show that humans on Earth are buying plastic bottles at a rate of 1 million units per minute. By 2050, scientists predict that the amount of plastic waste in the ocean will exceed that of fish.
- ✓ Despite the successive introduction of plastic restriction orders, the continuous improvement of plastic recycling and recycling technology, 91% of plastic waste is still unreasonably recycled today.



1.2 Our Social Responsibility



Circular economy is an economic growth model with efficient and circular use of resources as the core, "reduction, reuse and resource recovery" as the principle, low consumption, low emission and high efficiency as the basic characteristics, in line with the concept of sustainable development.

Under the recycling model, once the "waste" in economic activities is produced, it will be pushed to the self-recycling channel and recycled. To protect the environment, reduce environmental pollution, curb the trend of ecological deterioration, treat the earth's life, is a green life that everyone can access

In line with the concept of innovation and environmental protection, the company has developed a new type of laminating and coating -- regenerative RPVB(VAC) with senior doctor.



PART 02

Introduction and Characteristics of PVB



LET'S GO GREEN

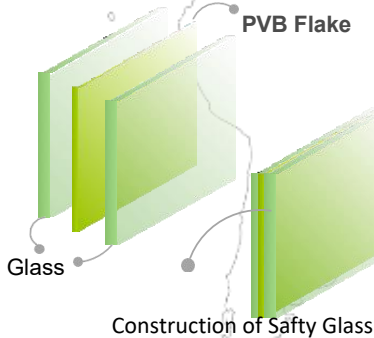
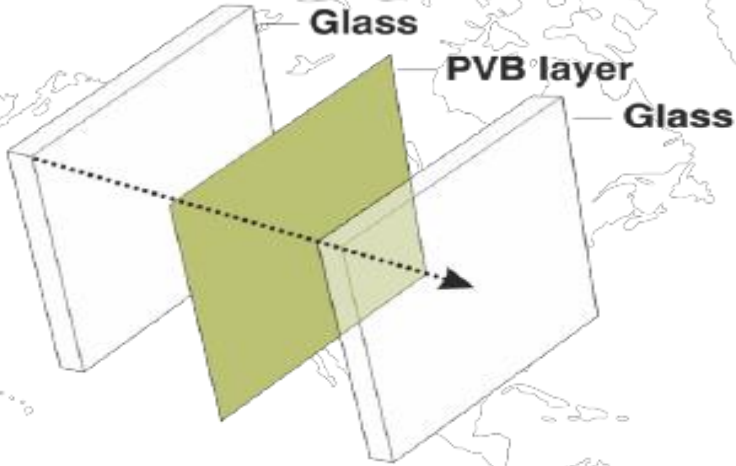
LET'S GO GREEN





2.1 What is PVB(Polyvinyl Butyral)?

Laminated Glass Construction



PVB (Polyvinyl Butyral) is a polymeric material with three different functional groups. Its unique structure provides versatility for wide applications.

There is an invisible layer of PVB film in the car windshield or the building safety glass, which can fix the glass fragments when the glass is broken and improve the safety in case of accident.

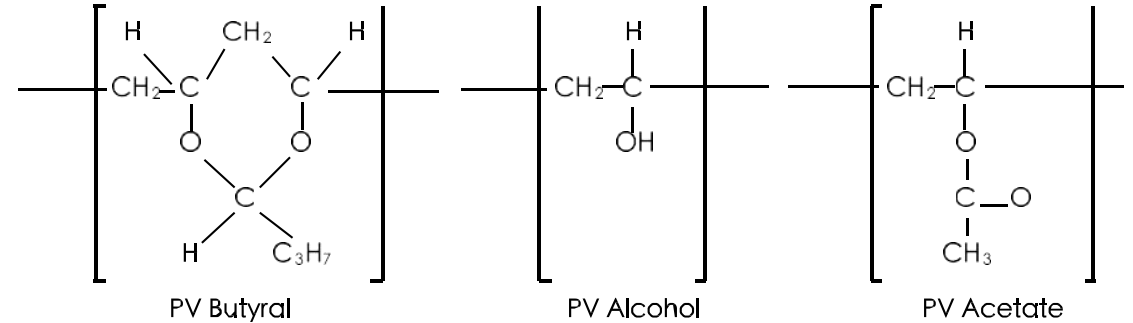
polymeric material
with three different
functional groups

Its unique structure
provides versatility
for wide applications



2.2 The Characteristics of PVB

- The Character of PVB (Polyvinyl Butyral):
- (1) Outstanding binding efficiency;
- (2) Toughness and flexibility;
- (3) Excellent weatherability.
- At present, the industrial use is mainly for
- safety glass sandwich.



PVB chemical formula

Characteristics of RPVB

- Reduces carbon emission and water consumption
- Excellent weatherability, non-hydrolysis
- No DMF
- The purification to recycle PVB includes separation, refinement, and modification,
- through which waste PVB could be converted to useful raw materials that meet quality demands.
- Conforms to REACH regulations
- PVC-free, eliminates the pollution of Dioxin
- Has customizable properties to satisfy market needs



PART 03

Cyclic Utilization of RPVB(VAC)



LET'S GO GREEN





Production Technology and Process

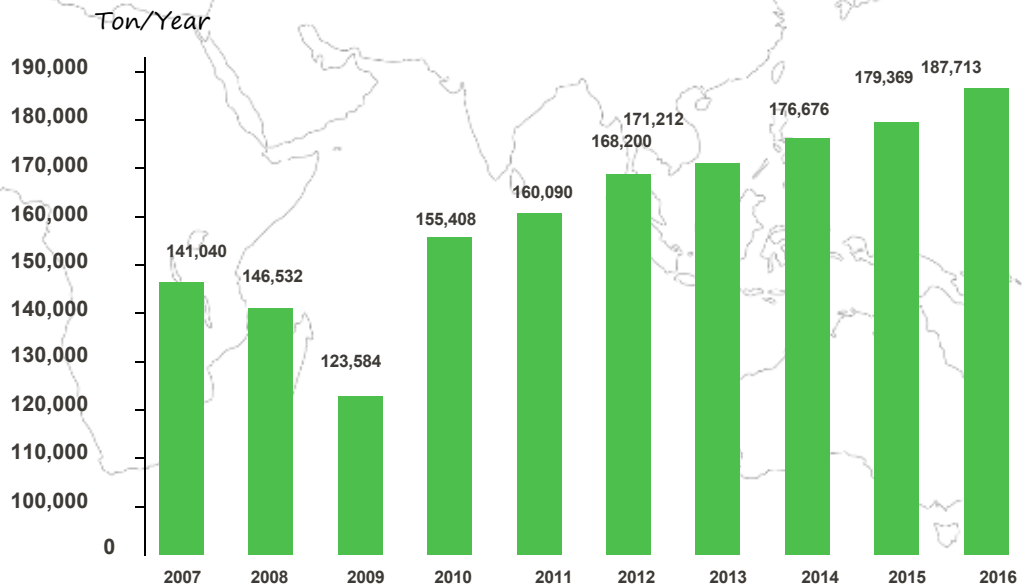
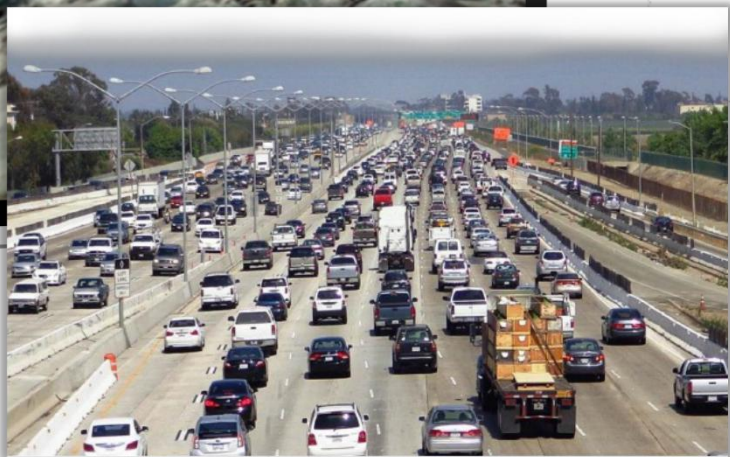
Waste vehicle plastic film glass is demoulded and physically grinded and chemically dissolved in China, the United States, Japan and Europe. Finally, regenerated soluble esters are formed by polymer transformation through innovative technology unique to Hangzhou Max Earn Advanced Material Company, and then coated and laminated to produce new post-finishing adhesive materials. In a real sense, it can be realized from recycling to utilization.





3.1 Quantity of Global Waste Windshield

According to the global automobile production of 1 billion pieces, the global monthly waste is about 80 million vehicles. And there is 1-2 kilograms of PVB(VAC) averagely extracted from each abandoned vehicle. In addition to laminated glass in building glass, it is estimated that the global average monthly output of waste PVB(VAC) is about 180,000 tons.



The Annual Production of Waste PVB



3.2 Previous Disposal Method of PVB(VAC)

Occupation of land resources

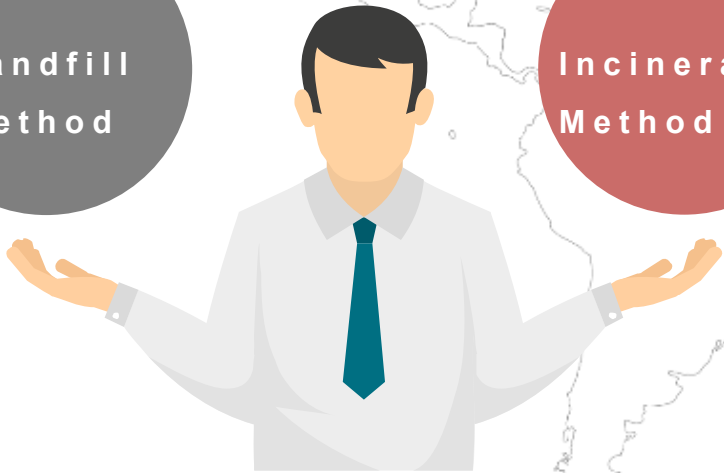
Heavy Air-pollution

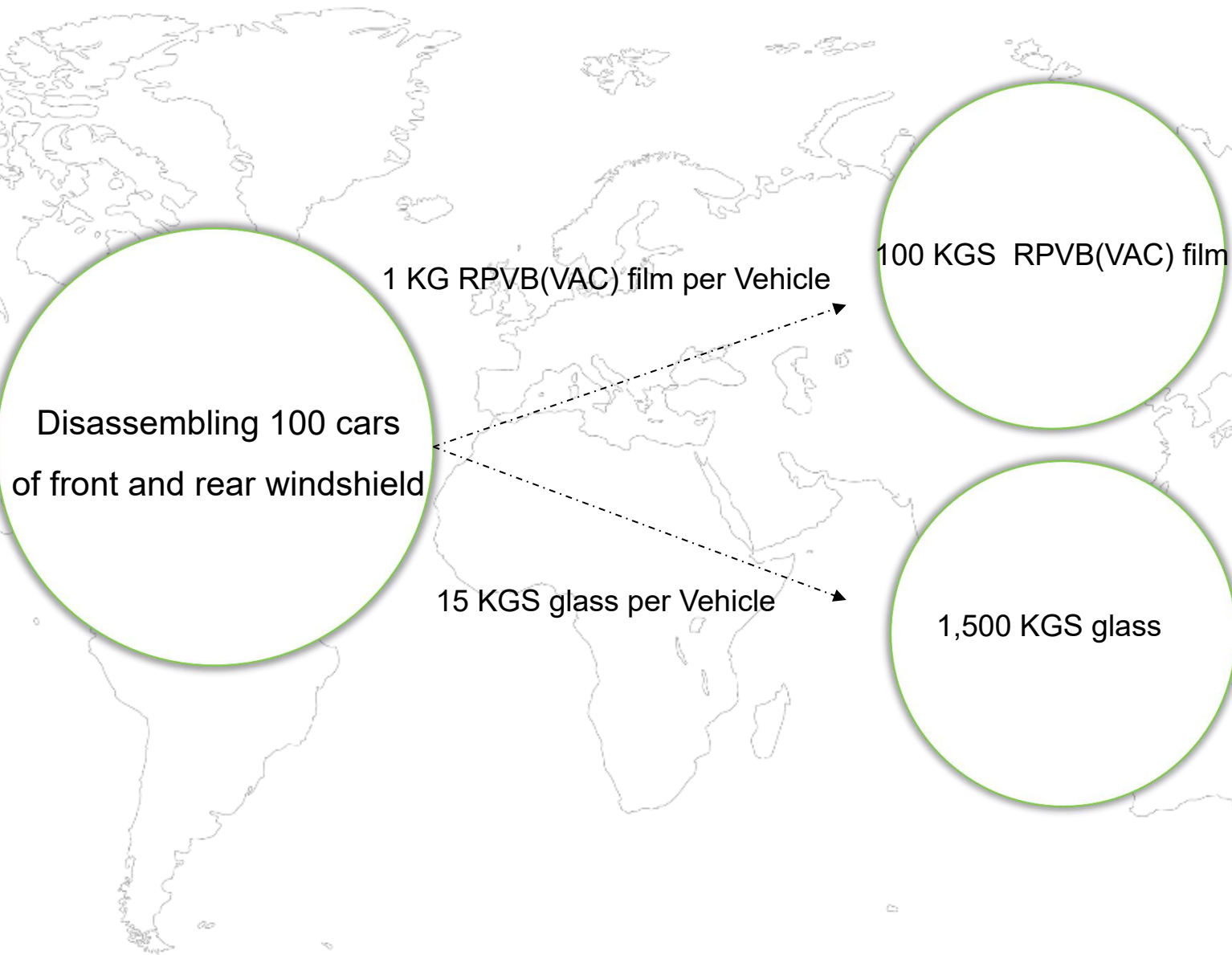


The majority of damaged waste windshields ends up in incineration or landfills. However, it will take approximately a million years to decompose, which would lead to irreversible **resource waste**.

Landfill Method

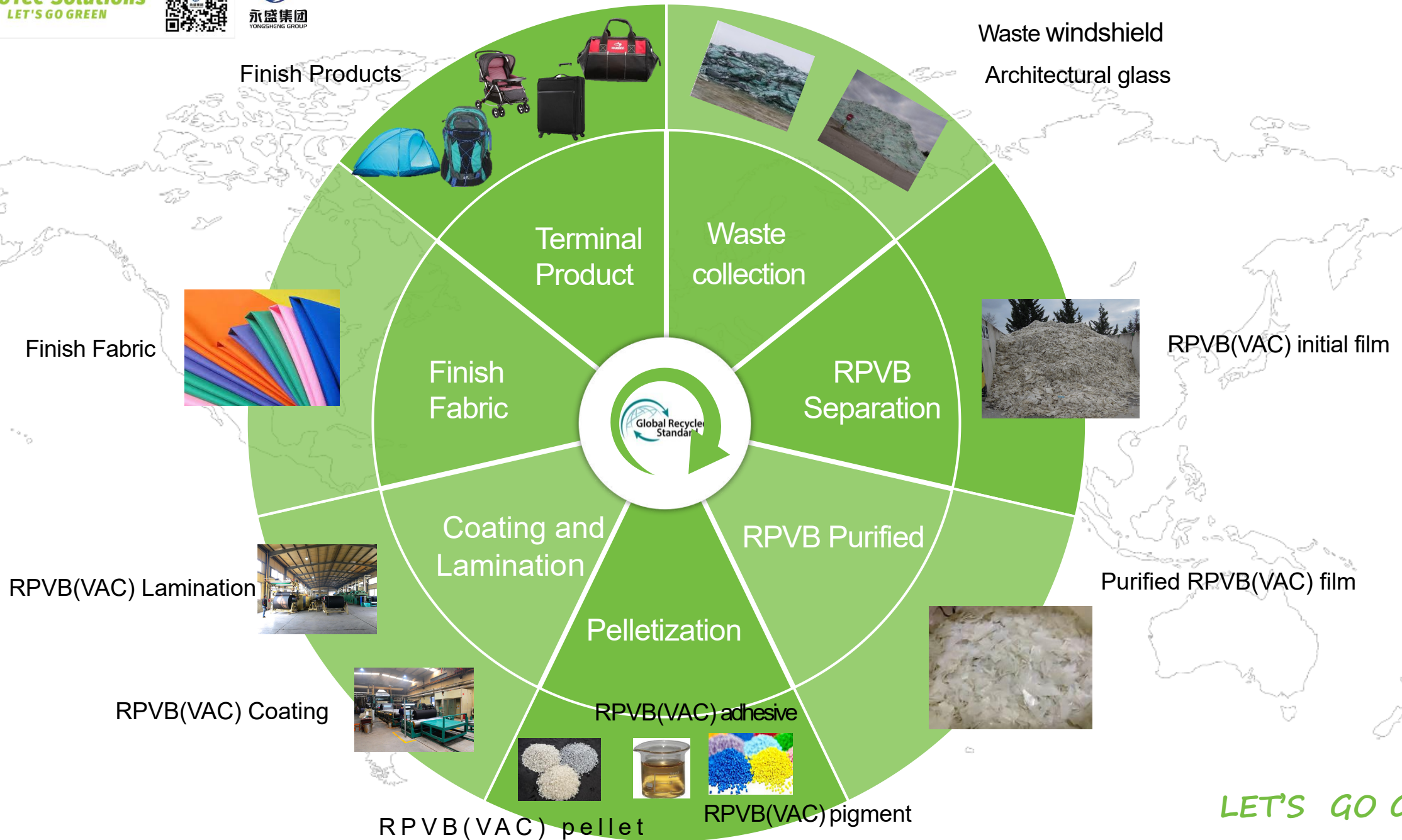
Incineration Method







3.3 PVB(VAC) Cyclic Utilization





3.4 Reduction of Carbon Emission & Water Consumption

Using recycled materials is one of the effective ways to reduce the ecological overload of the earth

1KGS of RPVB(VAC)

53KGS

Water Consumption

17KGS

Carbon Emission

Reduction of Carbon Emission

Item	Name	Consumption	Emission Coefficient	Carbon Emission (kg / CO ₂ eq.)
01	Polyvinyl Alcohol	0.80 kg / kg	6.1672	4.9338
02	Butyric Aldehyde	0.45 kg / kg	---	---
03	Electricity	2.00 kwh / kg	0.6360	1.2720
04	Steam	10.00 kg / kg	0.2336	2.3360
05	Water	45.00 kg / kg	0.1900	8.5500
06	Recycling Process	0.13 kwh / kg	0.6360	0.0818
Amount				17.0100

Reduction of Water Consumption

Item	Name	Consumption (KG/KG)
01	Polyvinyl Alcohol	8.0
02	Polyvinyl Butyral	45.0
Amount		53.0



PART 04

GRS Certification



LET'S GO GREEN





4.1 Global Recycle Standard

Global Recycle Standard(GRS) Certification

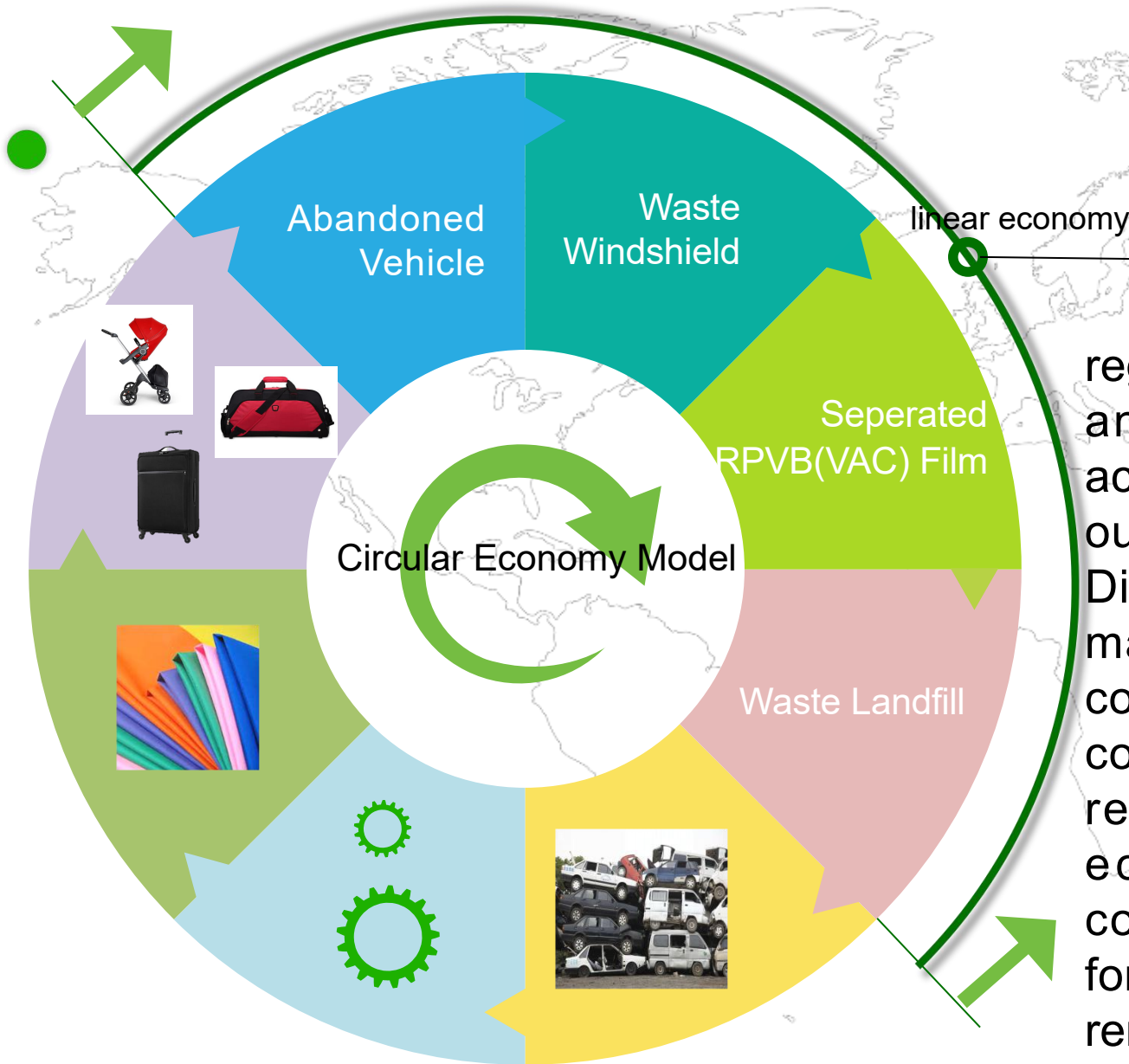
could be transferred to customers through the procedures set up by Control Union to illustrate the co-characteristic of the products.

The standard applies to the full supply chain and addresses traceability, environmental principles, social requirements, and labelling.





4.2 Circular Economy Model



The circular economy model is a kind of regeneration system, by slowing down, closing down and reducing the energy and material cycle, to achieve the goal of minimizing resource input, waste output, carbon emissions and energy consumption. Different from traditional linear economy, when raw materials are obtained from natural environment, commodities are made and discarded directly after commodities are made. Linear economy will cause resource depletion. The circular economy is an economic development model based on the continuous recycling and utilization of materials, forming a repeated cycle of resources, products and renewable resources.



PART 05

Market Prospects of RPVB(VAC)



LET'S GO GREEN



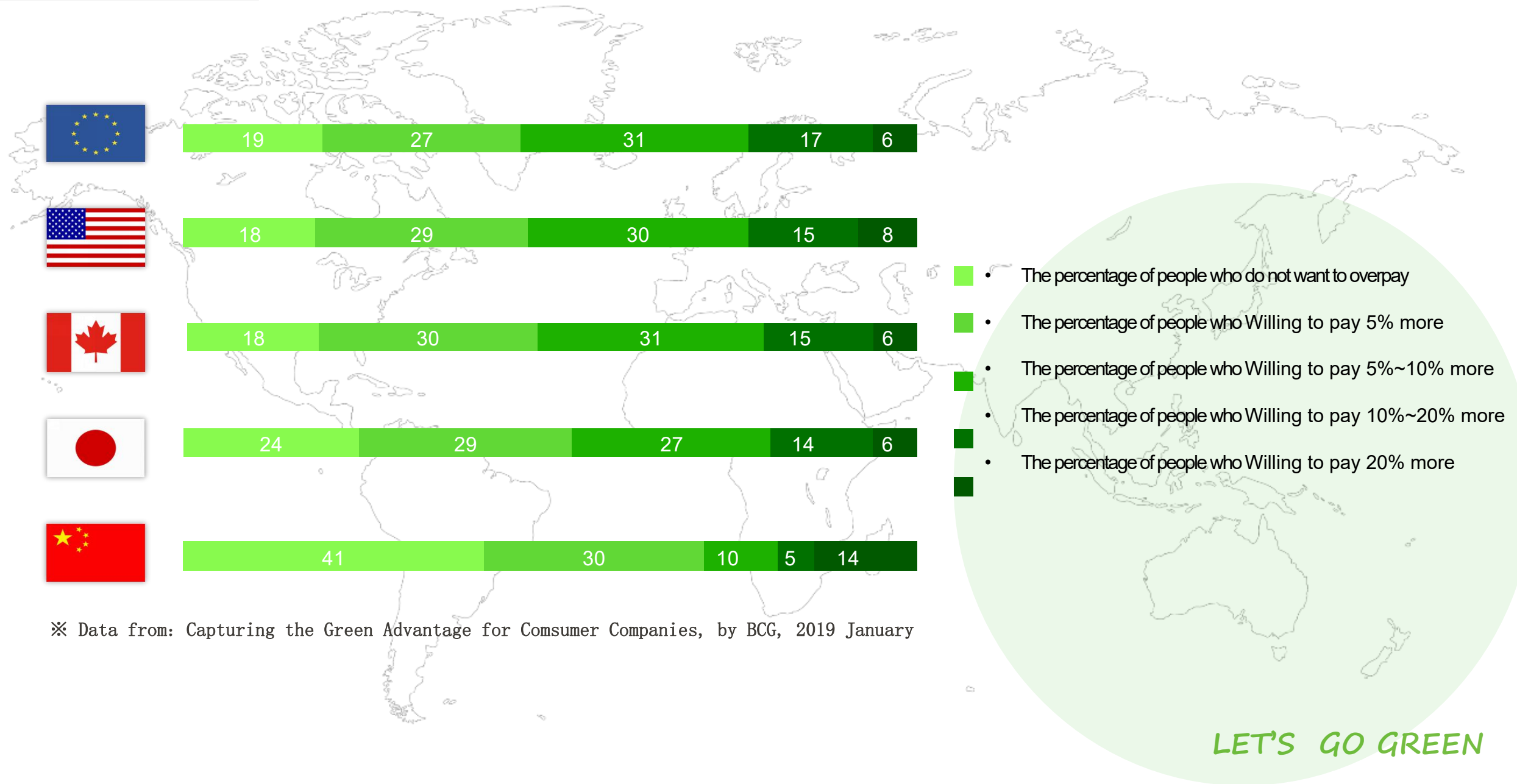


5.1 Potential Market for Green Products





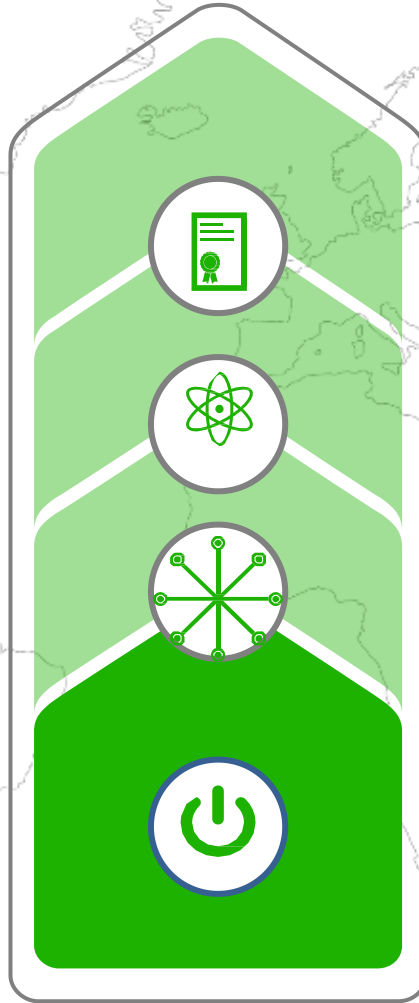
5.2 Green Consumption





5.3 Core Competitiveness

Core Competitiveness



Patant Density

- Regional patent
- Patents coverage
- Duration of patent

Mature Production

- Steady supply of raw materials
- Stable peoduction formula
- Stable peoduction line

One-stop production chain

- Weaving, Textile
- Dyeing , printing
- Coating , Lamination

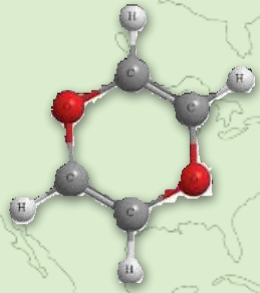
ECO Regulations

- Comply with REACH
- Global Recycle Standard (GRS)
- Sb-free, Dioxin Free

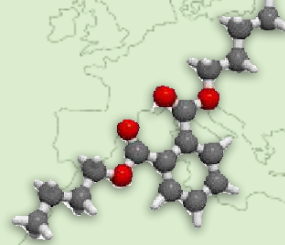


5.4 PVC is Being Prohibited

Thousands of brands around the world have formulated spontaneous policies to ban the use of PVC, including Nike, adidas, Reebok Mizuno, IKEA, Dell, Apple, BMW, Mercedes, LEGO and other alternative materials, which do not have the "basic conditions for substitution".



Dioxin



Phthalates



PVC Prohibition

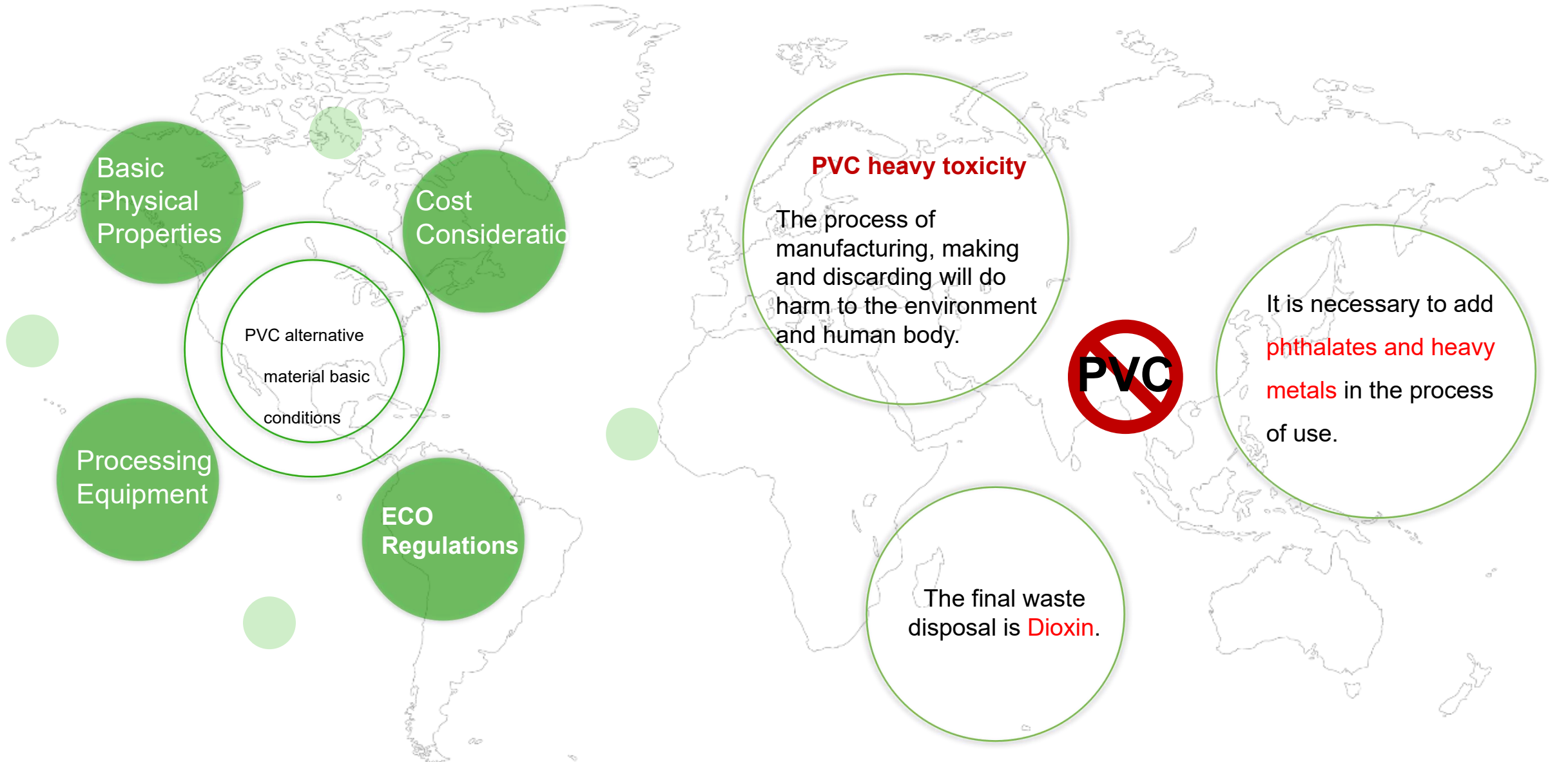
PVC annual global production

Unit: Ten thousand tons

Year	1980	2002	2003	2005	2006	2007	2012	2013	2015
Output	1,100	3,346	3,527	4,018	4,279	3,554	3,610	3,930	4,161



5 . 4 PVC is Being Prohibited and Replaced



Basic Physical Properties

Cost Consideration

PVC alternative material basic conditions

Processing Equipment

ECO Regulations

PVC heavy toxicity

The process of manufacturing, making and discarding will do harm to the environment and human body.



It is necessary to add **phthalates and heavy metals** in the process of use.

The final waste disposal is **Dioxin**.



The basic conditions that must be considered to replace PVC

Processing equipment: according to the existing processing equipment is the most productive, will save extra investment.

Quality factor: the threshold of basic physical property must be crossed so as not to lower the quality standard due to environmental protection

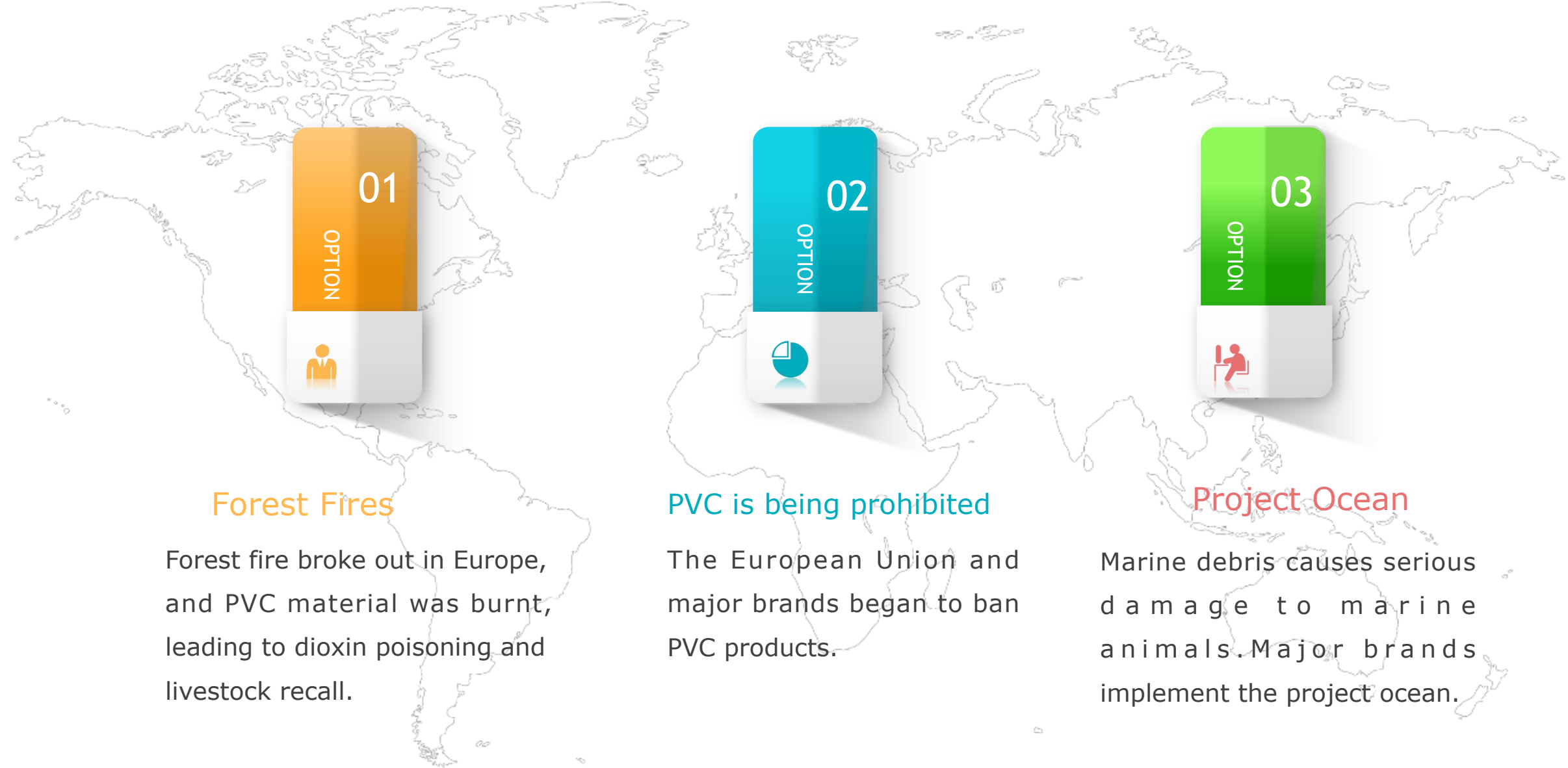


Cost factor: the cost must be controlled in the terminal price acceptable range

Statutory factor: except the environmental trend of pvc-free, basic environmental regulations must still be complied



5.5 Environmental Acciden



01
OPTION


Forest Fires

Forest fire broke out in Europe, and PVC material was burnt, leading to dioxin poisoning and livestock recall.

02
OPTION


PVC is being prohibited

The European Union and major brands began to ban PVC products.

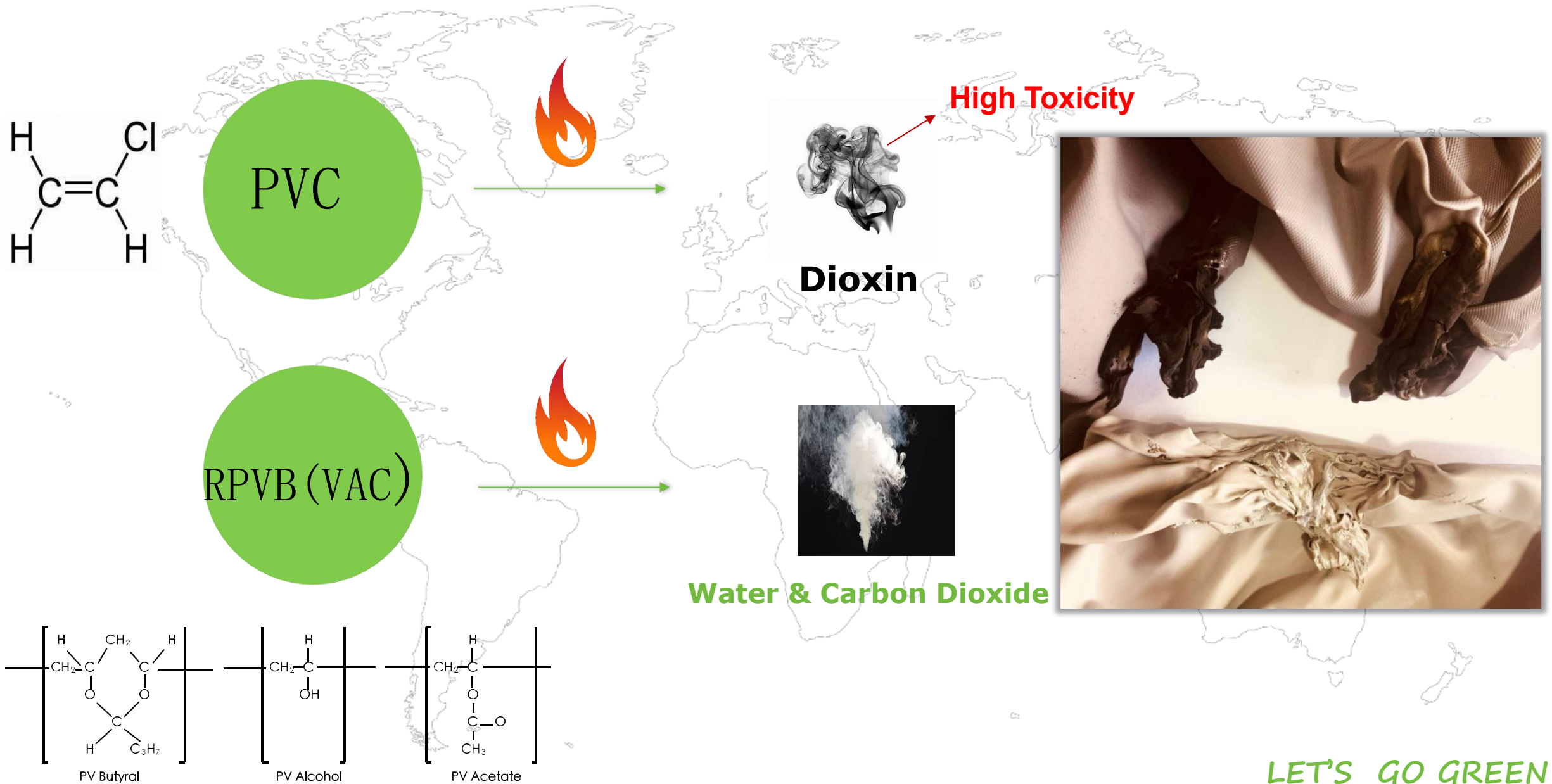
03
OPTION


Project Ocean

Marine debris causes serious damage to marine animals. Major brands implement the project ocean.



5.6 Combustion comparison between PVC & RPVB(VAC)





5.7 Film Comparisons

Item	RPVB (VAC)	PVC	TPU	Coaguated PU	TPE (SBS)
Chemical Compositon	Polyviny Butyral	Polyvinyl Chloride	Thermoplastic Polyurethane	Solvent-based Polyurethane	Styrenic Block Copolymer
Weatherability	Reactively Insert	Reactively Insert	Easily Hydrolyzed	Reactively Insert	Easily Degraded and Oxidized
Flexibility feeling	Adjustable	Adjustable	Unadjustable	Adjustable	Adjustable
Physical property level	3-4	3-4	4-5	3-4	2-3
Anti-scratch level	4	4	4-5	2-3	3
Dioxin pollution	none	Confirmed as Pollutant	none	none	Confirmed as Pollutant
Printability	Feasible	Feasibel	Feasibel	Feasibel	Not easy
High-Frequency Process	Feasible	Feasible	Feasibel	Feasibel	Infeasibel
REACH	Pass	Costly	Feasibel	Costly	Feasible
CP-65	Pass	Costly	Feasibel	Costly	Feasible

➤ On a scale of 1 to 5 with 5 being the best



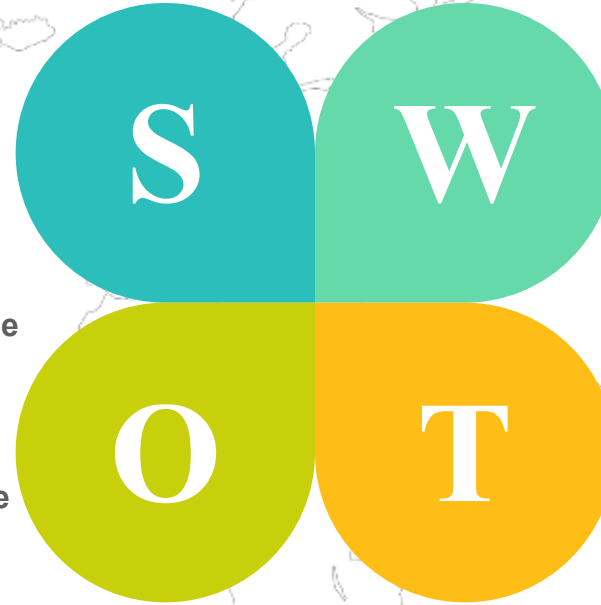
Item		RPVB(VAC)	PVC	Coaguated PU	TPU
Chemical Property	Chemical composition	Polyvinyl Butyral	Polyvinyl Chloride	Solvent-based Polyurethane	Thermoplastic Polyurethane
	Weatherability	Stable	Stable	Easily Hydrolyzed	Easily Hydrolyzed
	Yellowing	5	5	3	4
Processibility	Process	Calendering	Calendering	Solution Coating	Film Coating
	High Frequency Process	Feasible	Feasible	Feasible	Feasible
	Printing	Feasible	Feasible	Feasible	Feasible
Physical Property	Anti-abrasion	4	4	4	5
	Flexibility	4	4	4	5
	Softness	5	4	5	3
	Abti-Scratch	5	4	4	5
Eco Assessment	Dioxin Contamination	None	Confirmed as Pollutant	None	None
	DMF Content	None	None	Trace	None
	Recycling Rate	Above 80%	Above 80%	Unrecycleable	Under 10%
	Eco Regulation	REACH Passed	REACH (Coastly)	REACH Passed	REACH (Coastly)



SWOT Analysis of RPVB(VAC) and Various Films

- Leading technology with both depth and horizontality
- Rigorous patent density with market exclusiveness
- Environmental Certification with Consolidated Transaction Loyalty
- Products with market segregation

- Products with circular economy green color elements, in line with market demand
- PVC is gradually prohibited
- Renewable raw materials with low cost and cost competitive
- Restriction of Raw Material Import in Mainland China and Vietnam to Reduce Competitive Risk
- The target market with large in scale and long-term development
- The Government Provides Development Resources for Green Products
- Enterprises are seeking to differentiate and realize social responsibility



- Low self-control rate, high cost
- Insufficient recognition of enterprises and low recognition of products

- Different recycling laws affect the quantity and price of raw materials.
- The market is generally concerned about the "conversion cost" of new materials.
- China has no recycling regulations



PART 06

Environment Interest & Value Proposition

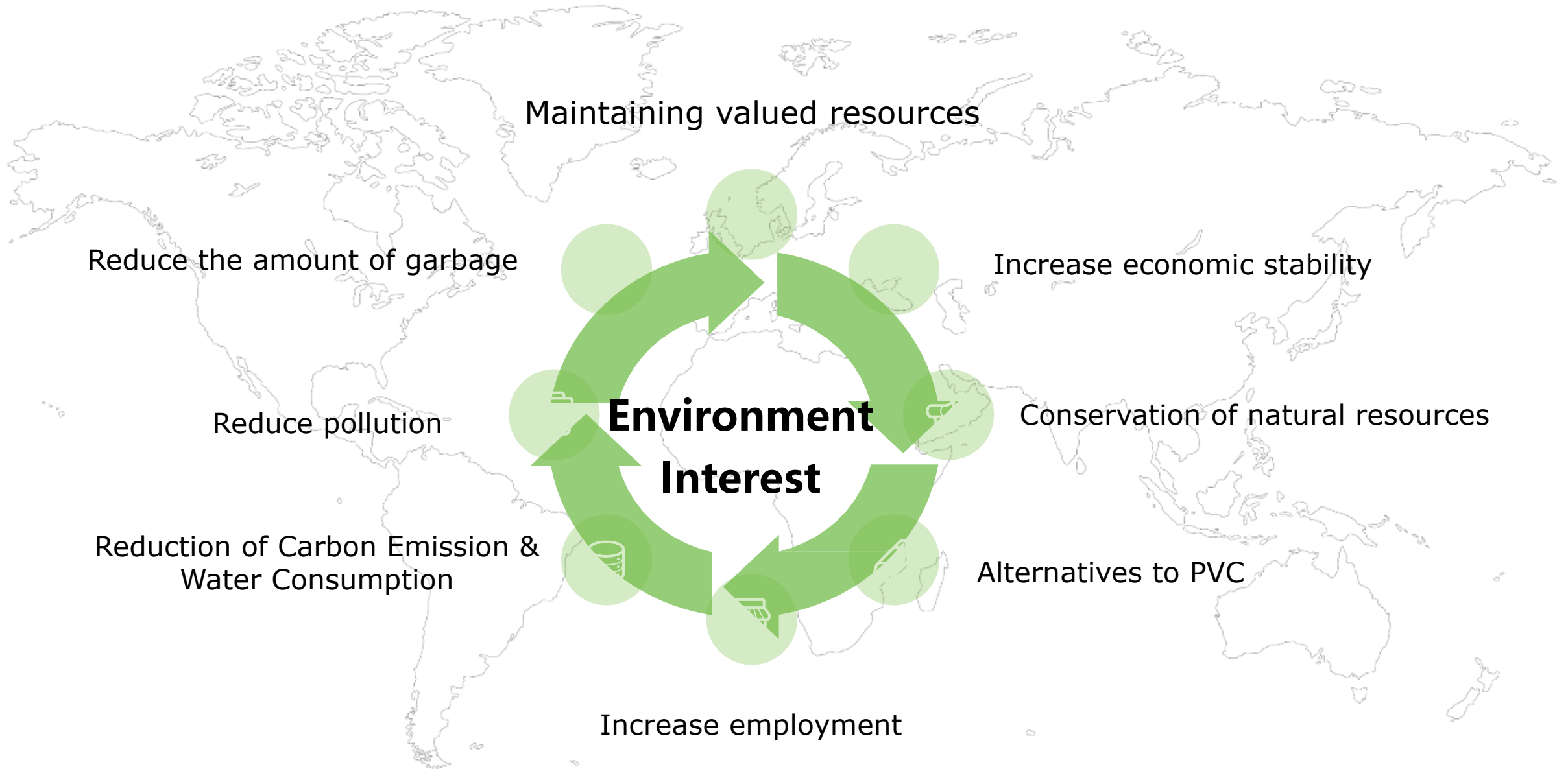


LET'S GO GREEN





6.1 Environment Interest of RPVB(VAC)





6.2 Value Proposition of RPVB(VAC)

“

❖ Circular economy model commodities are the mainstream of specific niche markets, so enterprises and brands can realize their corporate social responsibilities and also conform to specific target markets and consumption habits.

“

Based on the consensus of the core supply chain partners, the production of raw materials to fabrics is completely in accordance with the established strategic goal of expanding the market scale in competitive prices.



Recycled PVB series products comply with various environmental protection laws and regulations, including REACH, a-01 and p-65, etc., and can be used as PVC alternative materials, following the brand spontaneous environmental protection policy.

”



6.3 Infringement Protection

We are the global leader in transformation of RPVB(VAC) in waste windshiled into environment-friendly products, and the only manufacturer in the world.



NO.	Country	Patent No.	No.	Country	Patent No.
01	Taiwan	M 269189	10	Germany	Nr.20 2005 002 798.7
02		179677	11		Nr.20 2004 009 575.0
03		M 252554	12		Nr.20 2009 007 356.4
04		M 261370	13	U.S.A	B2 8486848
05		M 355246	14	Japan	3111535
06		M 387769	15		3104266
07		M 382353	16		3152471
08		M 387541	17	China	726854
09		Holland	OCTROOINUMMER 1025575		18

➤ In order to protect the customers and avoid the risk of product infringement, we continue to refine our tactics on patent to reach a certain sophistication.



PART 07

Application of RPVB(VAC)



LET'S GO GREEN





7.1 Treatment of RPVB(VAC)



+



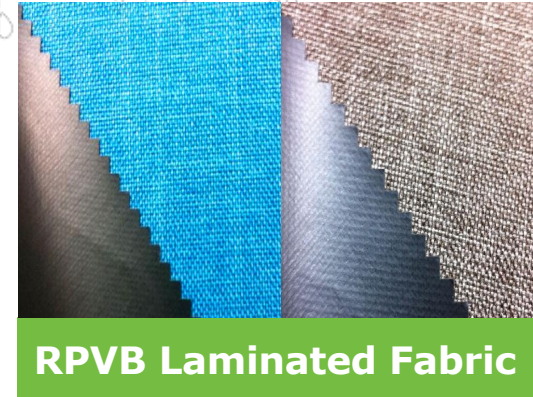
=



+



=



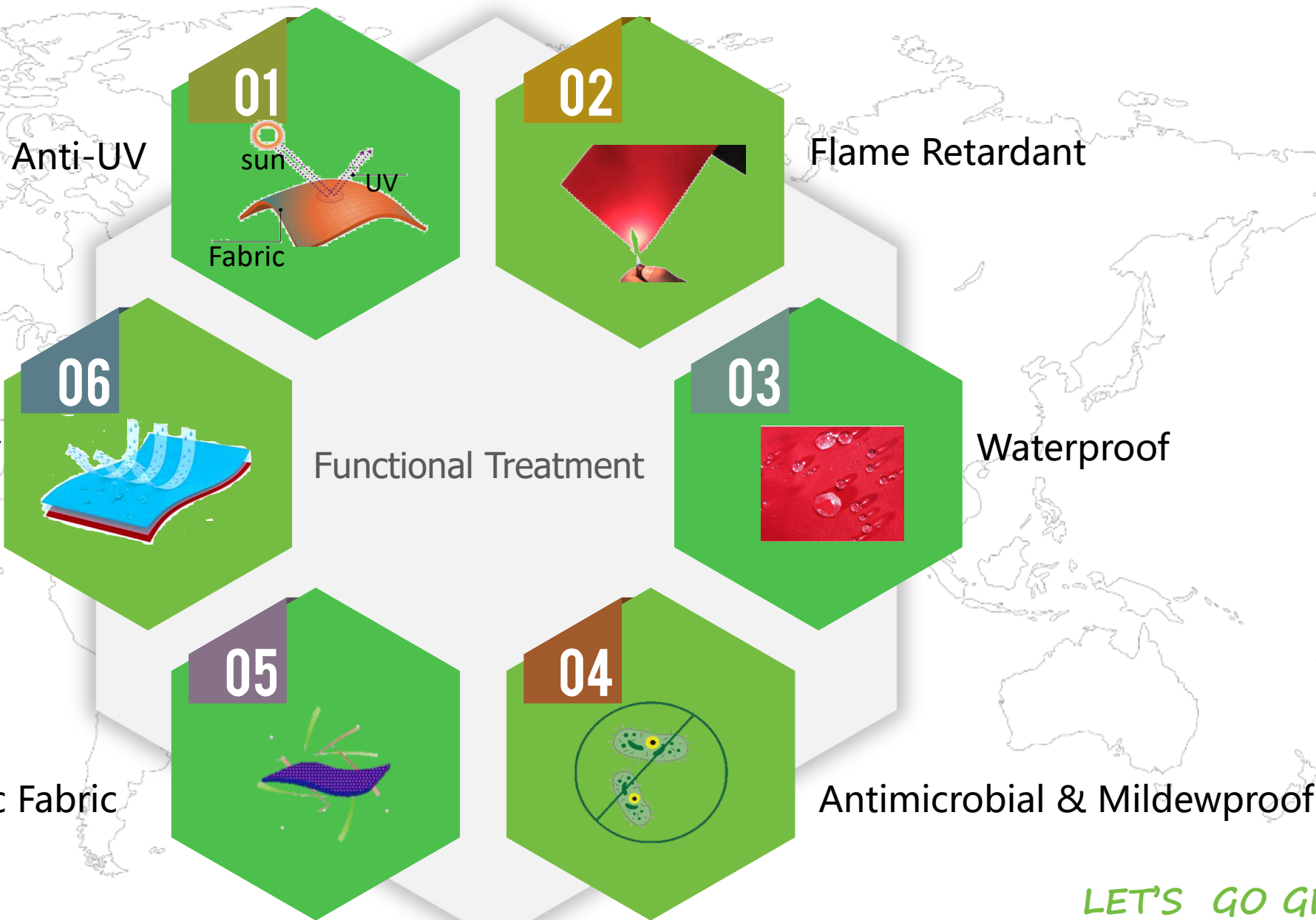


7.2 Application of RPVB(VAC) Fabric





7.3 Functional Treatment of RPVB(VAC) Fabric





PART 08

100% Environment-friendly Fabrics



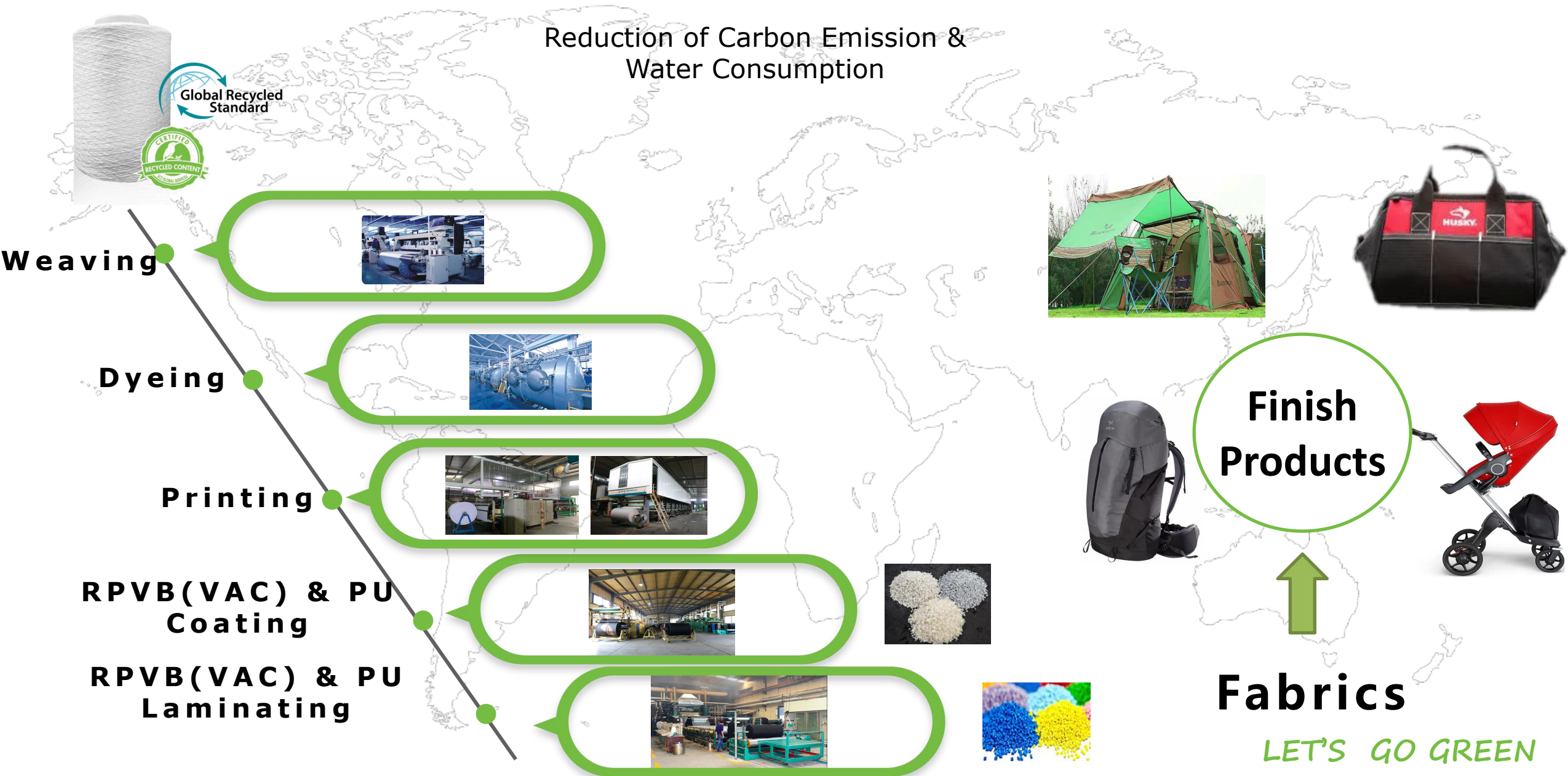
LET'S GO GREEN





100% Environment-friendly Fabrics

Reduction of Carbon Emission & Water Consumption





Certification System



Certificated by GRS, Comply with Traceability , Environmental, Social responsibility, Label and General five requirements.



Comply with OEKO-TEX Standard 100 which Standards for the prescribed limits on the content of harmful substances in yarns, fibers and various types of textiles.



In line with the REACH standard, it aims to protect human health and environmental safety, and pursue sustainable social development.



bluesign product means that the process and products are in line with environment, health and afety; EHS is the world's latest environmental norms and standards to ensure consumer safety.



California's standard 65 has been designed to reduce exposure to toxic chemicals.It allows California residents to eliminate carcinogens and reproductive toxic chemicals from consumer products and industry in certain ways.



6. Partner

We have established business relationship with hundreds brand companies

Fabric application of Brand customer



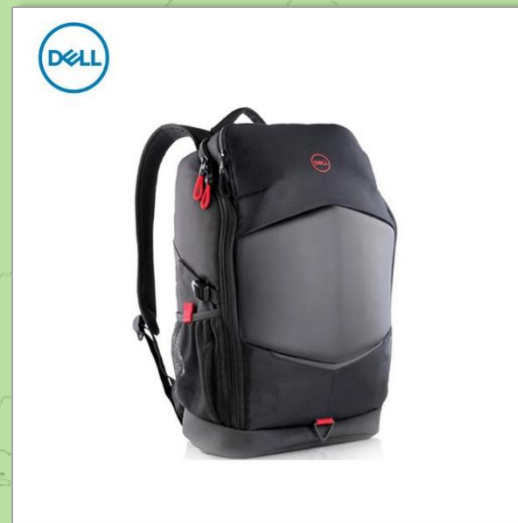
Toolbag



Backpack



Hockey Bag



Laptop



Brand Customers





Creative Advertising

Eagle Creek



Creative advertising board designed by Eagle Creek in OR show



Our company is one of the leading companies of fabrics production. In order to make full closed-loop green renewable fabrics, we have been cooperated with the green regeneration upstream American supplier Unifi and the low-energy dyeing and finishing plant with Bluesign qualification. We are determined to establish a industry integration of green recycled fabric from raw yarn, low-energy dyeing and recycled PVB finishing (multi-functional sandwich). We will share the common social responsibility to maximize the resource recycling.



LET'S GO GREEN



We are the enforcers of waste recycling

Give waste a chance to reuse



Thank you

J·BONWE YONGSHENG ADVANCED MATERIL

Contact us: 400-886-7010