

Introduction Composite Pallets

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Complete tires



Tire shreds



Rubber chips



Rubber granules



Section 1: Introduction



Tire shreds

Rubber chips

Rubber granules

Environmental Hazards



USA: Estimated 330 million tires every year



USA: Estimated 73,000,000 tons of plastics every year

Solution:

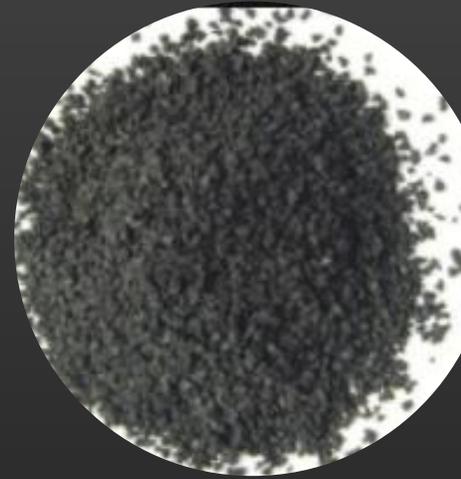
Our scientist have Engineered and designed a process that converts waste plastic mixed with used tires crumbs and a specially developed chemical to produce a composite thermoplastic polymer (TPE)

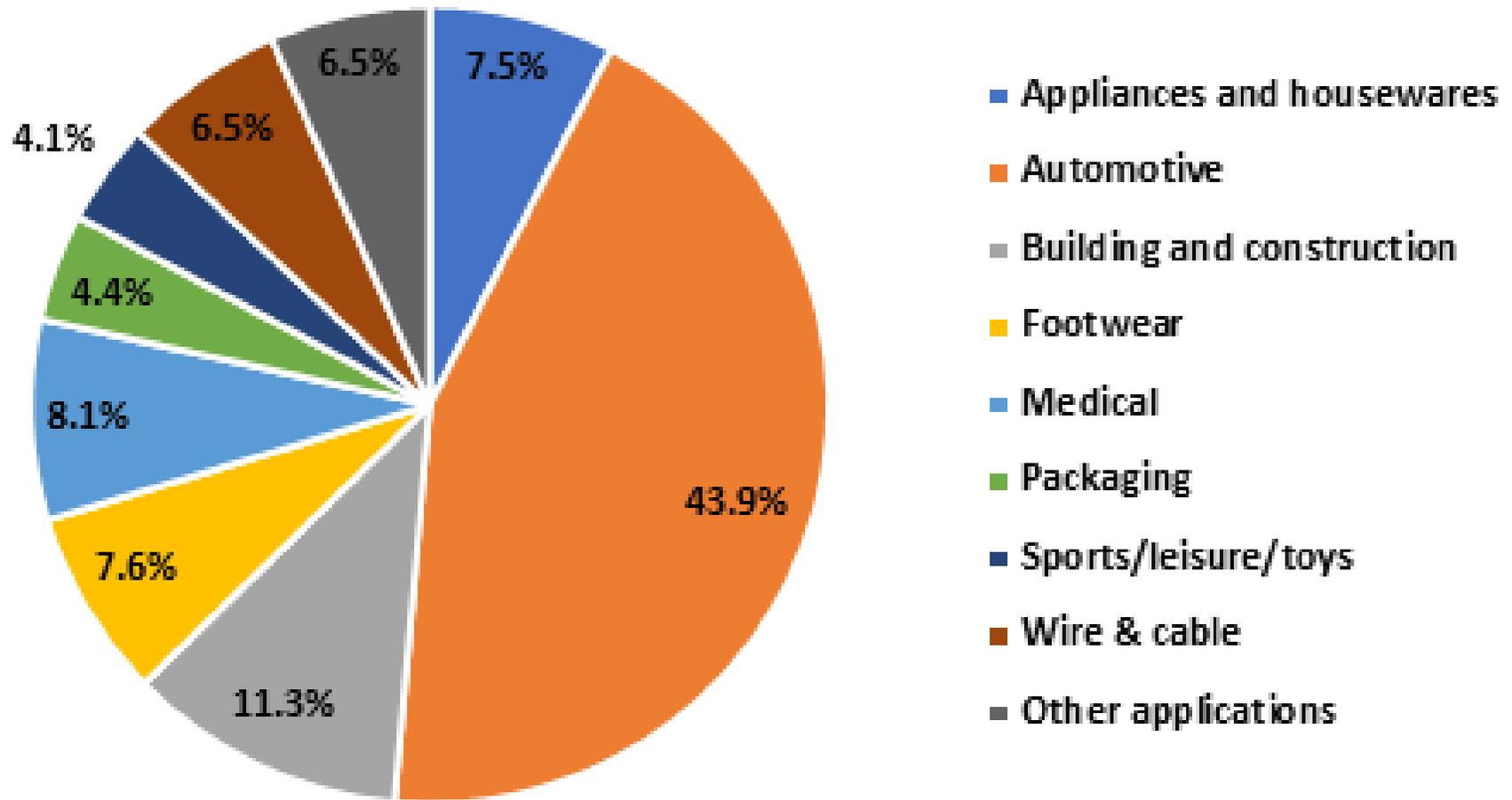
The produced polymer could be used as input material to molding process to make many molded products such as Automotive under the hood parts, outdoor furniture and most importantly Logistics Composite Pallet to be used in many industries.

Introduction: Thermoplastic Elastomers (TPEs)

- TPEs have a long history
- Utilized in many industries: Auto, Molded goods, etc.
- Environmentally sustainable material
- Providing a high-quality product
- Performs as good or better than virgin mixtures
- Cost effective

- Our team has developed several molded goods:
 - Auto dashboards
 - Composite logistics shipping pallets
 - Many other products





The Global market for TPE by end-use application, 2020 (%)

Worldwide Demand: 2019: 4,71M tons; 2020: : 3,23M tons (Covid-19 issues)

CAGR of 9.5% for 2020-2026

2017: 23B USD 2026: 37B USD

Major Players: DuPont, BASF, Covestro AG, LCY Group, and Kraton Corp.



Section 2: The Proposed Plan & Next Steps

Proposed Plan

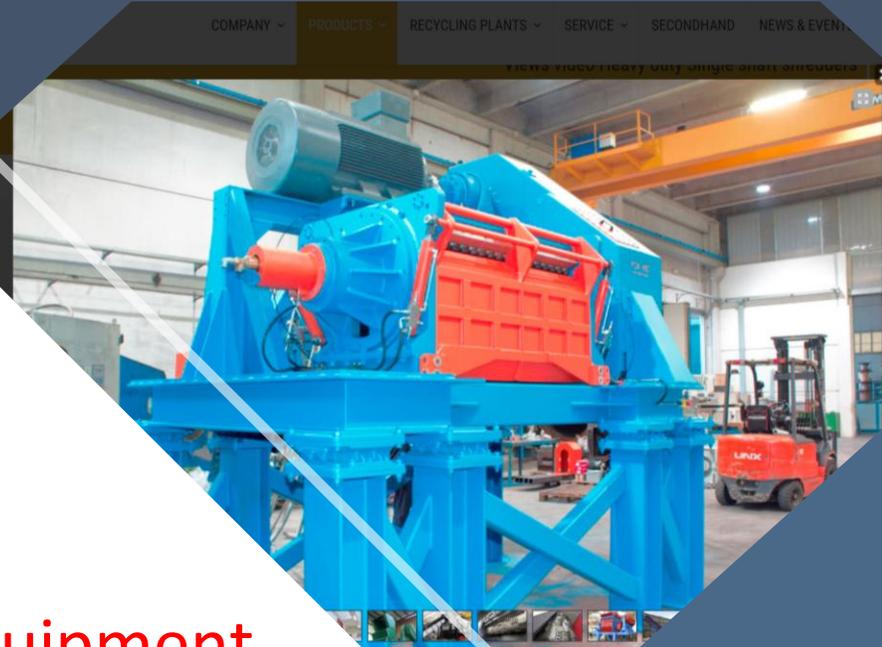
- Three Locations: One in SC, one in GA and one in Saudi Arabia
- Tire recycling plant: recycling at least 3.3 million tires a year, at each location, for a total of 10,000,000 tire recycling program
- Plastic recycling plant at each location: recycling a total of 200,000,000 lbs of plastics
- Pelletizing equipment at each location
- Molded goods operation at each location: Pallet manufacturing and other molded goods
- This environmentally sustainable industrial plan will be one of a kind in the world solving major recycling issues present in the United States and the KSA
- All equipment: USA or EU made



Future Steps to Take

- Signing the NDA paperwork with the interested parties
- Discussing the technical issues with your technical officials / engineers:
 - Tire recycling
 - Plastic recycling
 - Pallet manufacturing
 - Other molded goods
- Initiating the funded feasibility study
- Signing Contracts / Agreements
- Agreement on the types and models of equipment
- Establishing & agreeing on the proposed budget
- Designing the manufacturing plants
- Manufacturing of the equipment
- Establishing the infrastructure
- Estimated time for the start date: 12 months after signing the contract





Section 3: The Equipment



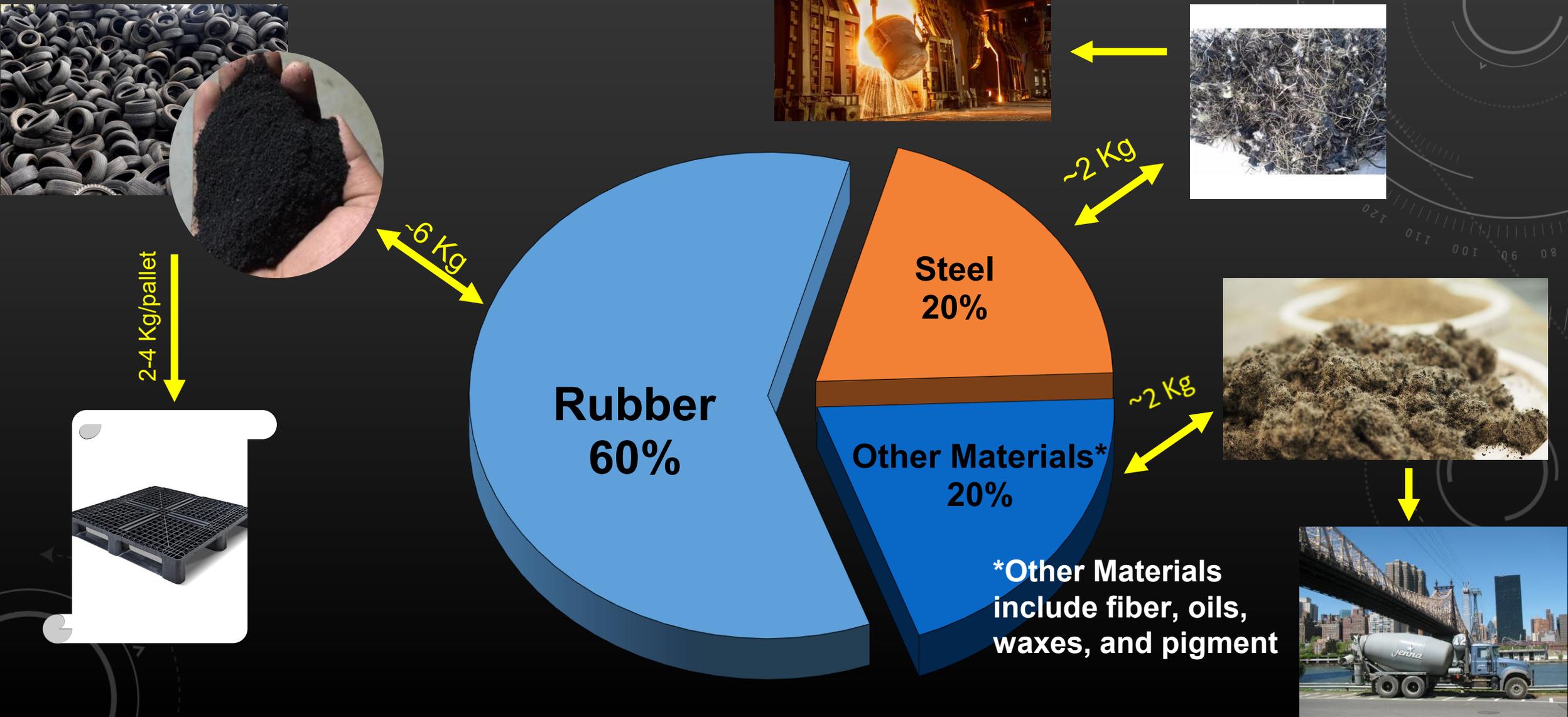
Introduction: The Equipment

- Team members are capable of designing the proper equipment based on the initial feasibility study
- Team members have used these types of equipment in the field for over 30 years
- All of the equipment will be either USA or EU made
- Team members will help in sourcing of the most life-cycle cost effective equipment
- The equipment will be divided into 4 areas:
 - A) Tire shredding equipment
 - B) Plastic recycling equipment
 - C) TPE pelletizing equipment
 - D) Molded goods (e.g., Pallet production equipment)

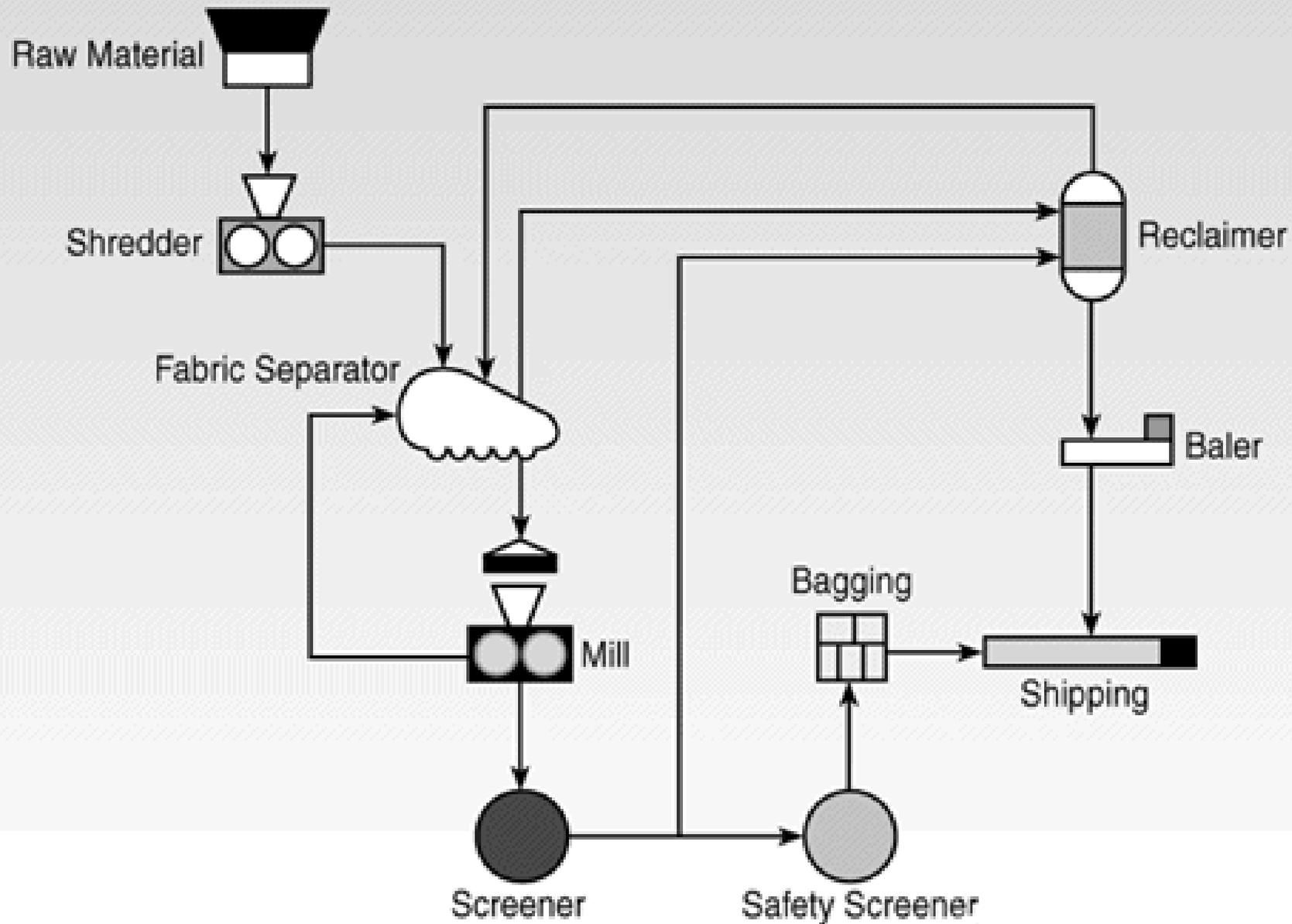


Tire Shredding
Equipment

Passenger Car Tire Composition (~10 Kg)



Schematic of the tire shredding machine



NOTE: Magnets are used throughout the process

Proposed Scrap Tire Recycling System for this Program

- Producing crumb up to 0.6 mm to 0.15 mm size
- Automated system
- Excellent reliability and safe
- Environmentally sustainable
- Runs 24/7
- Recycling ~6,000 tires/day/machine



Proposed Recycling Plan for 10,000,000 Tires

- Several locations: Recycling ~3.3 Million tires/location producing ~40,000,000 lb of crumb rubber per year/location
- Total crumb rubber/year (3 locations) = 120,000,000 lbs
- 45,000,000 lbs of highest quality steel (3 locations): Recyclable (\$)
- ~45,000,000 lbs of highest quality fibers (3 locations): Recyclable (\$)



Our Team Experience

Can provide the following services: Design of equipment; design of layout; training; assembly; initiating the facility; operating the plants; testing; market analysis; a turn-key process

The following is a few examples of the actual projects we have performed all over the USA



Our Team's Experience

- Has Designed and operated many State-of-the-art facilities around USA
- Automated systems
- Safest in the industry
- The recycling team has over 125 years of combined recycling experience all over the world (EU, USA, etc.)
- The team will be directed by Serji Amirkhanian with extensive experience of setting up these kinds of facilities
- Two of the team members own several tire recycling plants processing over 20,000,000 tires a year now
- Another team member has managed over 100s of staff in many recycling operations in the USA recycling over 50,000,000 tires for the last 25 years
- Part of the team members are several equipment manufacturers in EU and USA producing plastic and tire recycling equipment being sold in over 25 countries

Plastic Recycling Operation



Proposed Plastic Recycling

Overall Dimensions:

5250 x 3750 mm H=3260 mm

Blades:

interchangeable plates

Rotor dimensions:

L2000 - Ø750 mm

Plates dimensions:

80 x 80 x 30 mm

Weight:

30000 Kg

Motor drive:

160 kW / 200 kW

No. of plates:

78

- Use of highest quality steel
- Configurable blades for thickness and number of teeth
- 5 tons/hr per machine
- US or EU made machines





Section 4: Scrap Tire Recycling

Rubber Shredding Machine

- 3.3 million tires a year per machine
- Magnets in many locations
- Fiber collection system





Section 5: Scrap Plastics Recycling

Proposed Primary Plastic Shredding Equipment

Overall Dimensions:

3400 x 1800 mm H=3800 mm

Version:

electric / hydraulic

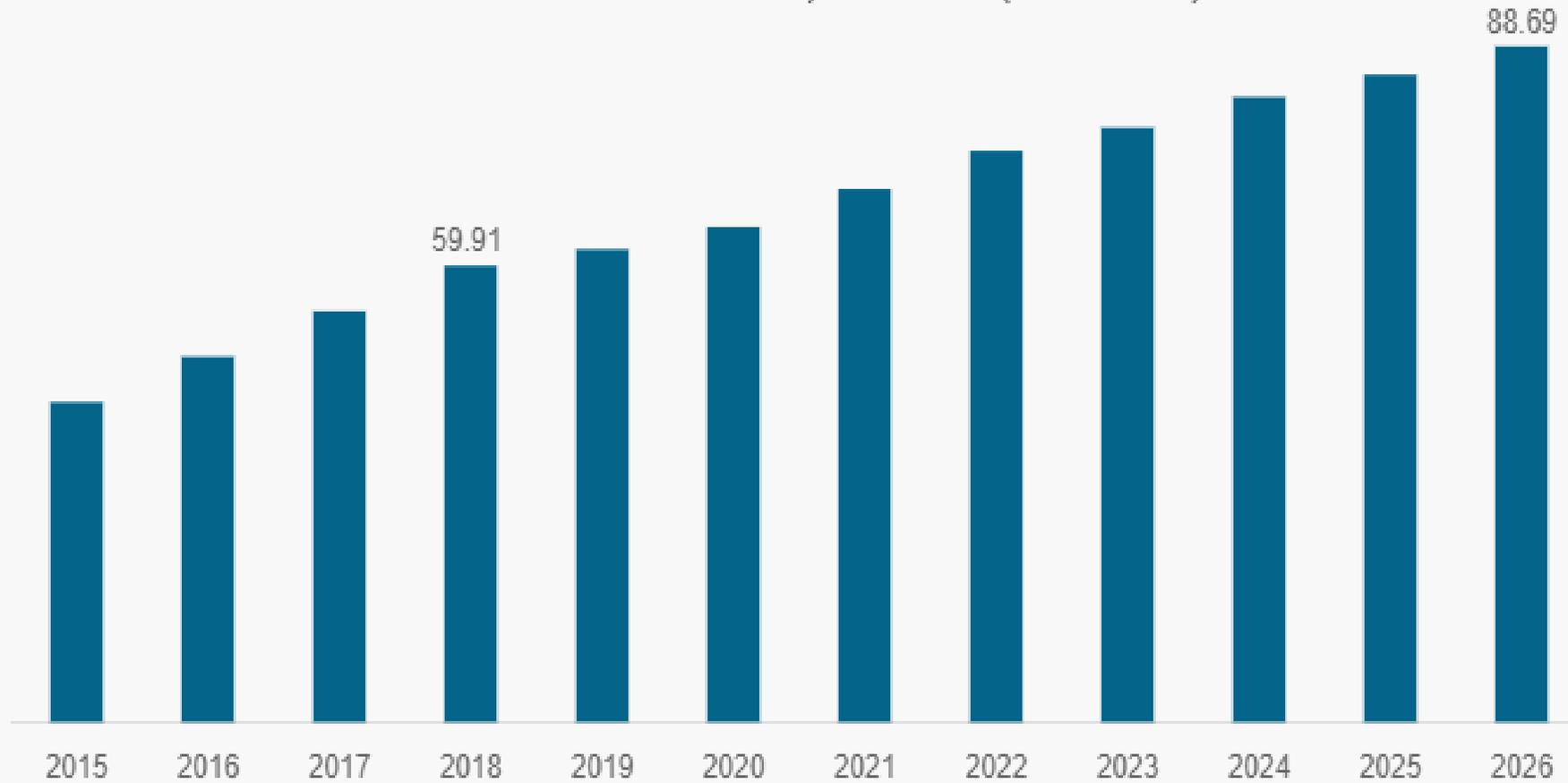
5 tons per hour input



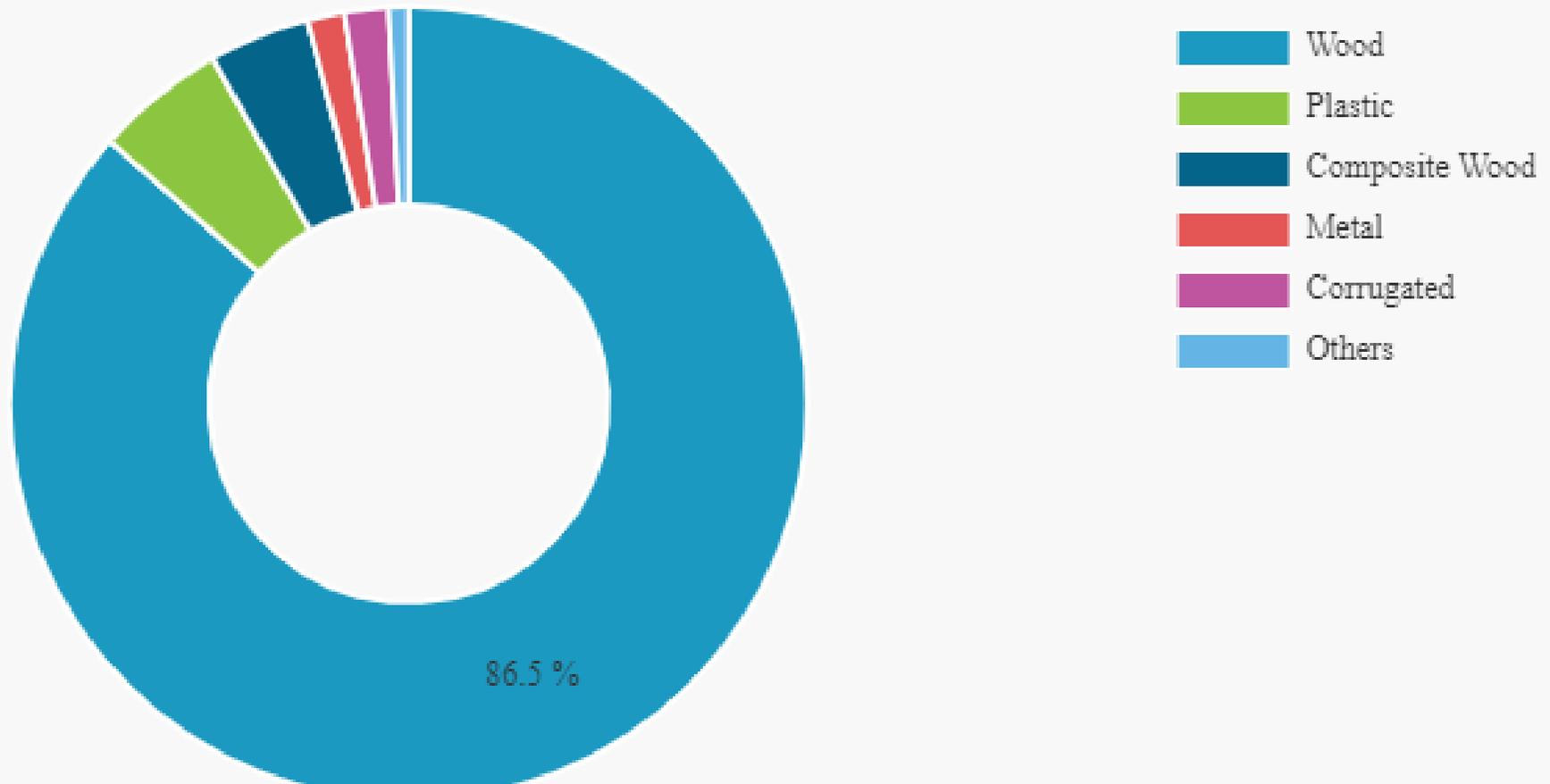
Pallet utilization around the world



Global Pallets Market Size, 2015-2026 (US\$ Billion)



Global Pallets Market Share, By Material Type, 2018



Plastic Pallets Global Market Forecast

Report Attribute

Details

Market size
value in 2021

USD 7.0 billion

Revenue
forecast in
2028

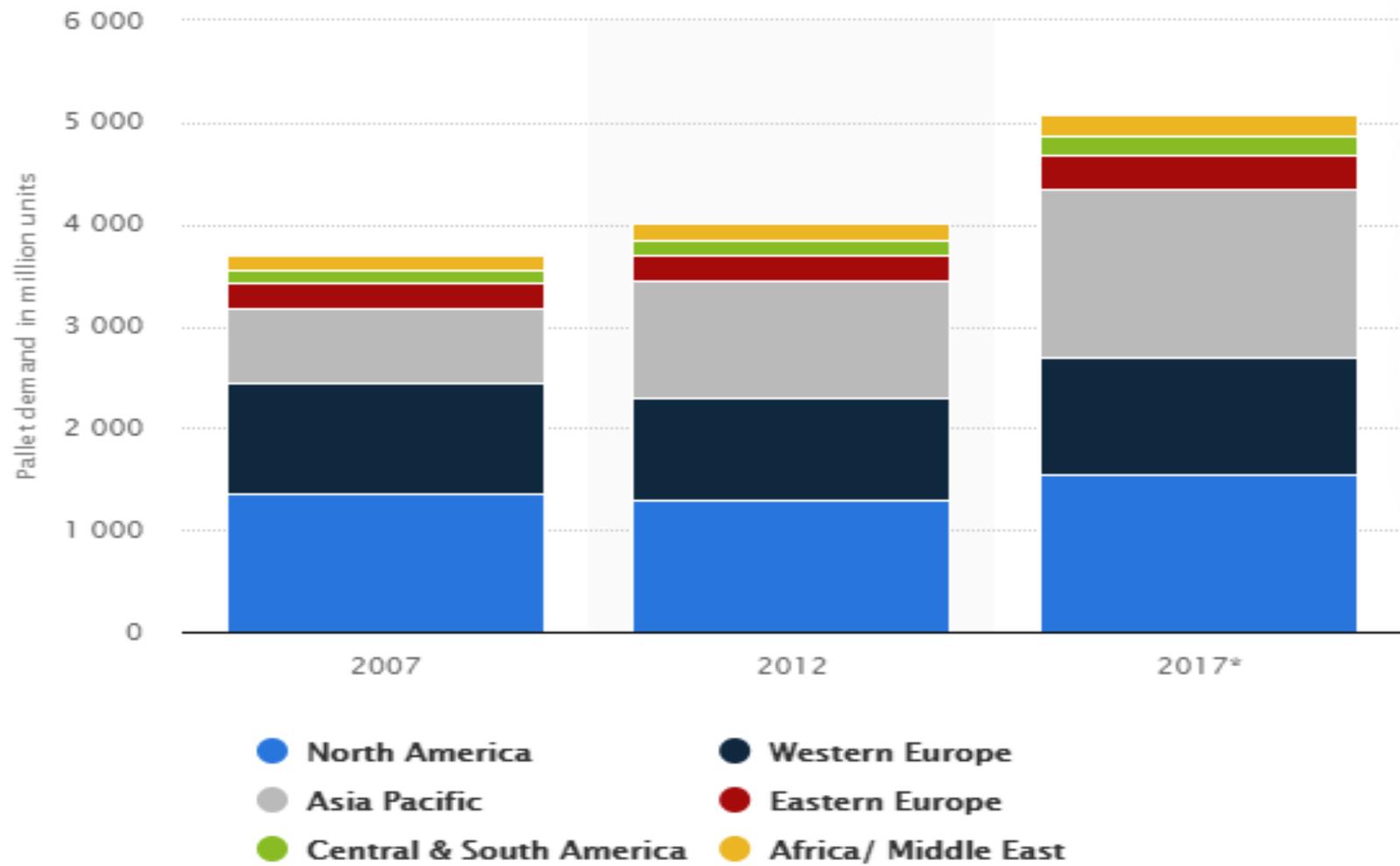
USD 10.4 billion

Growth Rate

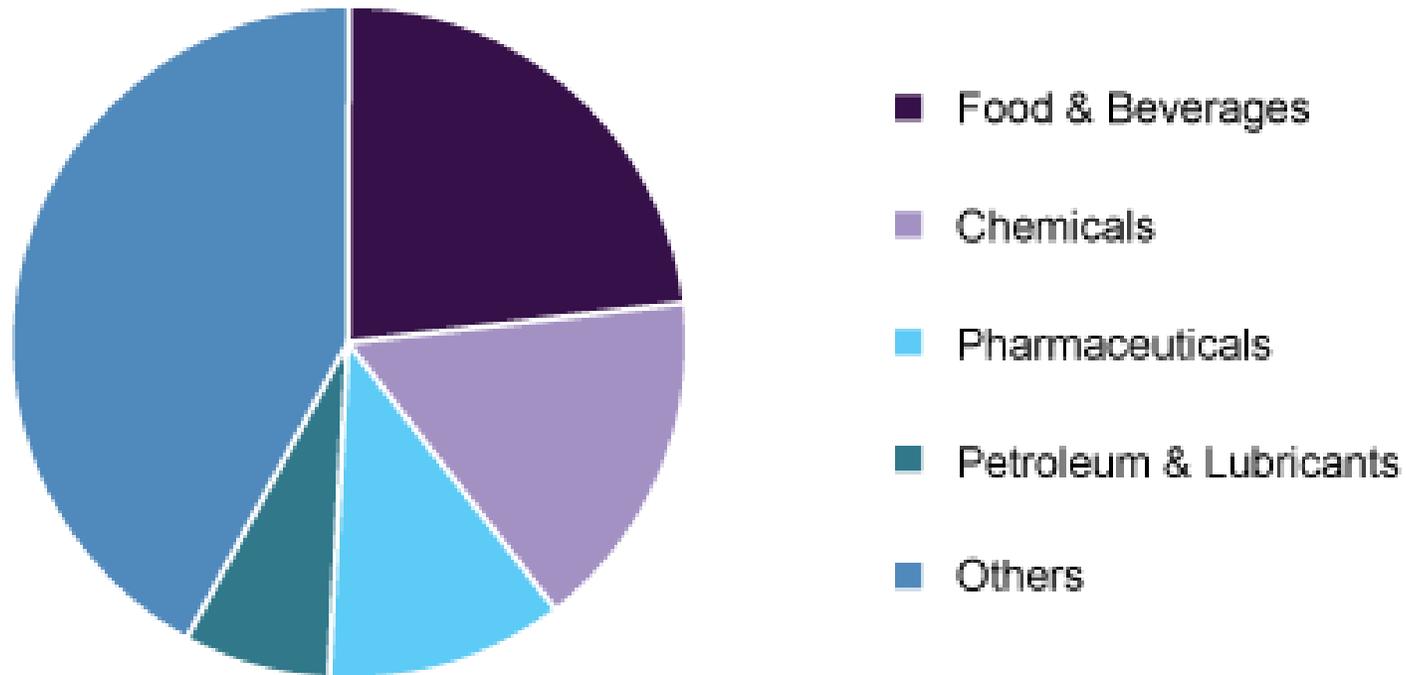
CAGR of 5.6% from
2021 to 2028

Base year for
estimation

2020



Global plastic pallets market share, by end-use, 2020 (%)



Environmental Hazards: Wood

- ✓ Soft pine Trees require 8-10 years to be commercialized
- ✓ One tree can make 6-8 pallets (depending on size)

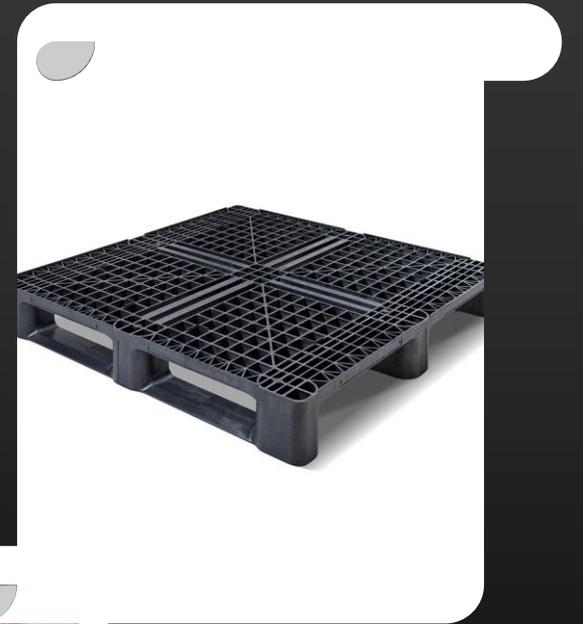


LOGISTICS COMPOSITE PALLETS: Characteristics



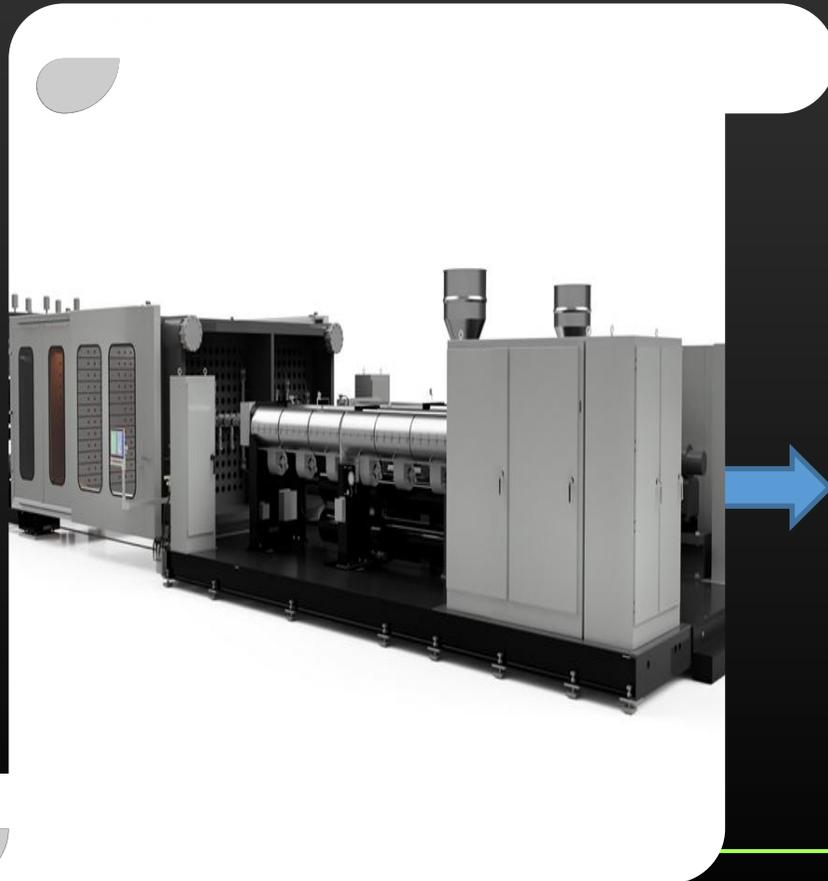
Any size, Any shape, Rackable, Nestable, Various weights,
Various dimensions, Surface treated, GSP device inserted

~100% Recycled Product



TPE MOLDING PROCESS TO PALLETS

The waste or virgin plastic is added to crumb rubber and then the chemicals are mixed together and introduced into the molding machine, designed by our engineers, to produce the Logistic Composite Pallets of any size, dimension, and load weight according to end customer's needs.



Impact of wooden pallet use in the United States

- Pallets carry about 80% of U.S. commerce
- 500 million pallets a year in the US replacing the worn pallets
- ~ 2 billion wooden pallets in the US
- MANY of them replaced each year
- This consumes an estimated 50% of the country's annual hardwood harvest



Impact of wooden pallets use in the USA

- ~ 7.6 billion board feet of lumber
- That's enough wood to cover an area 10 times the size of NY city
- Lumber industry: \$6 billion in annual sales
- ~50% of these pallets are intended to be used only once and then discarded
- Galvanized nails are hard to remove: a large percentage of these single-use pallets usually end up in landfills.



Injection Molding Machine

Output: ~750,000 pallets a year per machine.

Electricity: 3 Phase, 480v, 2000 amp

Input: TPE Materials (Plastics + Rubber + Chemicals)

Many shapes and sizes of pallets could be made
Different molds will be utilized for various pallets



LOGISTICS COMPOSITE PALLETS: Specifications

Many Specifications:

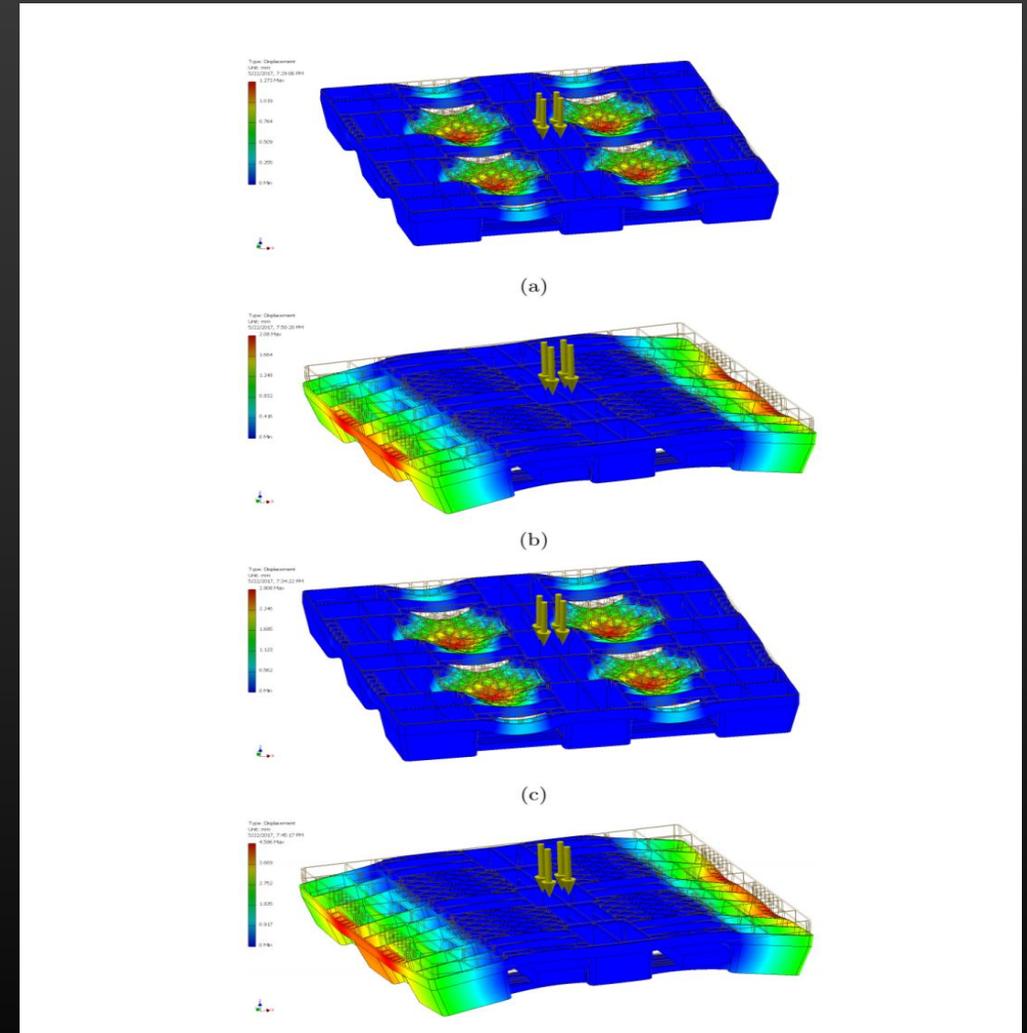
- Typical Petrochemical Pallet (CP7): 1300x1100x130 mm, 4 ways forklift entry with dynamic loading capacity of 1,500 Kgs and 4,000 Kgs Static.

- Other pallets with the following specifications could be produced (these are a few examples):
 - a) 1016x1220x146 mm, nestable pallets; 18 Kg, 4 way, dynamic loading: 2000 Kg, 9 legs static loading: 14000 kg, transportation: over 1000 pallets in a 16-m trailer
 - b) 1143x1143x140 mm, nestable pallets; 18 Kg, 4 way, dynamic loading: 2000 Kg, 9 legs static loading: 14000 kg, transportation: 900 pallets in a 16-m trailer
 - c) 1016x1220x150 mm, nestable pallets; 22 Kg, 4 way, dynamic loading: 2000 Kg, 9 legs static loading: 12000 kg, transportation: over 850 pallets in a 16-m trailer
 - d) Can design and produce any size pallet with various specifications

- We can design and produce any color, rackable, nestable, solid deck, washable, durable, and USA FDA approved material option

Conducted Many R&D Projects On The Design of Pallets

- Our engineers already have produced many pallets and have had many discussions with major companies (e.g., Tesla, etc.).
- Today, they're in negotiations with many major companies in the USA and overseas for utilization of these pallets



WOODEN PALLETS VS COMPOSITE PALLETS

Description	Wooden Pallet	Plastic Pallet
Hygiene (HACCP)	None	High
Own weight	High	Related with application in function of product
Airfreight weight reduction	Limited choice	No
Nails who damage goods	Yes	No
Splinters who pollute load	Yes	No
Suited for RFID	No	Yes
Low tolerance	Possible	Yes
Risk on failure in production change	Medium	Very low
Absorption of water	Yes	No
Suited ISPM N° 15	No	Yes
Paperwork heat-treatment / fumigation	Yes	No
Limited validity of treatment / fumigation	Limited	Unlimited
Any design possible	No	Yes
Adaptation of the pallet for the load	Low	High
Security at customs clearance	Not sure	Always sure
Recyclability and re-usablity	Low	High
Residual Value	Low	High
Operation cost	Pure cost	ROI or comparable with wood
Quality of the raw material	Natural product	100 % the same
Marketing image	Low	High
Environmental conscience reflection	Low	High
Identification	Limited	Based on logo, RFID, colour
Any option like : border, antislip, anti-slip rubbers	Not possible	Any possible
Border empty goods	Not possible	L profiles or external rims
Nestable pallets	Not possible	Place reduction



Executive Summary

Executive Summary

OBJECTIVE: Implementation of Recycling Tires & Plastics in the USA and the KSA

Recycling of Tires & Plastics:

- Transfer of know-how technology
- Set up manufacturing facilities for recycling of tires & plastics
- Set up a testing laboratory in the region for testing crumb rubber and plastic properties
- Utilization of the state-of-the-art equipment
- Market development

EXPERIENCE OF THE TEAM:

- > 120 combined years of experience
- Have designed several recycling plants
- Many years of R&D experience
- Consulted many companies in this area
- Have conducted over 30 years of research in these areas
- Have worked with equipment manufacturers for many years
- Have used the equipment in the field for many years



Executive Summary

OBJECTIVE: Implementation of thermoplastic elastomer polymers (TPEs)

THERMOPLASTIC ELASTOMERS:

- Transfer of know-how technology
- Set up manufacturing facilities for production of TPE
- Set up an Internationally Certified testing laboratories in the region for testing various TPEs and molded goods
- Developing new products
- Market development

EXPERIENCE OF THE TEAM:

- > 220 combined years of experience
- Developed over 30 new products
- Many years of R&D experience
- Consulted many companies in this area: Ford; BMW; Michelin; Honeywell International; Tesla; UN; etc.
- Inventor of many TPE process or products
- Have many Ph.Ds for R&D



PALLET UTILIZATION - GCC

40.000.000 Pallets/Yr



Petrochemical Industry: 17.000.000 Pallets/r



Most of them: One Way Pallet

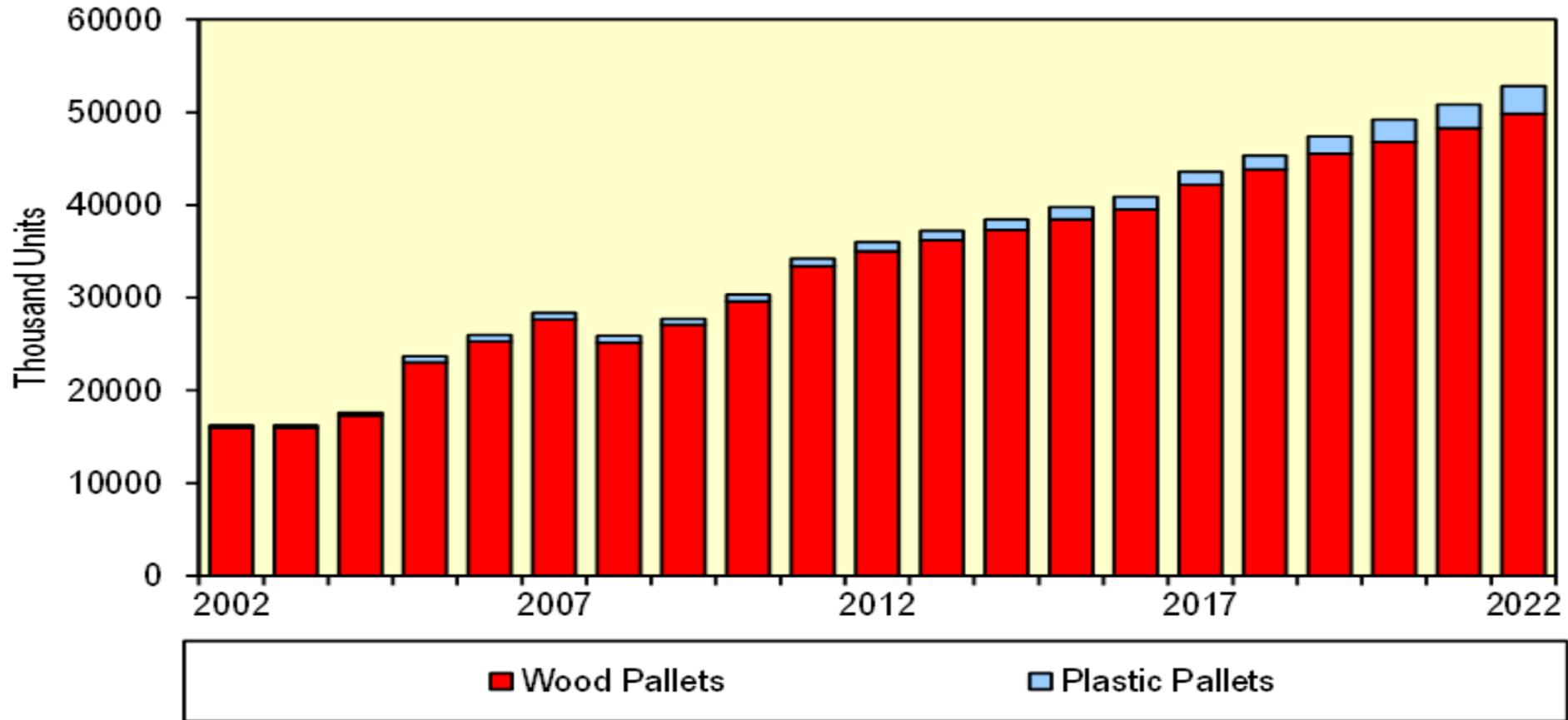


PALLET ISSUES WITHIN GCC

- a. Environmental regulations, local authorities' restrictions, logistics and other factors, created regular shortages in timber supply and huge spike in timber prices many times in last 10 years.
- b. Therefore, wooden pallets prices and availability are difficult to plan and predict.
- c. Many companies are seeking environmentally and sustainable materials to make logistics pallets.
- d. PolyChem USA LLC has developed a technology enabling the mixing of scrap and virgin plastics and used tires crumb rubber together creating composite logistics pallets.



PALLET UTILIZATION - GCC



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GCC's MARKET



Pallet Utilization In Petrochemical Industry In GCC Region

Petrochemical Market Demand 2020	
Details	Quantity(P/a)
Jubail - KSA	9,000,000
Yanbu - KSA	3,000,000
Total - KSA	12,000,000
Qatar	3,000,000
UAE	1,000,000
Oman	900,000
Kuwait	900,000
Grand Total	17,800,000



FINANCIALS:
Just for Production of Pallets
(Excluding the Tire and Plastic Recycling)

Composite Pallet Production Infrastructure Requirements:

Capacity: 750,000 Pallets per year (250,000 per location).

Equipment requirement:

1. Three injection Molding Machines
2. Pallets Stacking & strapping station
3. Forklifts 2-3 tons capacity (3 Units)
4. Trucks for raw and finished materials (3)

OPERATION & ADMIN STAFF/LOCATION

Working Plan: 3 shift a day, 6 days a week, 50 weeks a year

Required Staff/Location:

Duty	Count	Remarks
Plant Manager	1	Technical background
Admin Officer – Accts& HR	1	Accountant
Admin Officer – Clerk	1	Purchasing & store keeper
Maintenance Officers	1	Mechanical, Electrical / Pneumatic
Machines Operators	5	5 / shift / machine
Forklift & Truck drivers	2	
House keeping	1	Clean offices and sites and general labors

FINANCIALS for 3 SYSTEMS (35-lb Pallet) (Excluding the infrastructure)

ACTIVITY	QUANTITY	USD
Turnkey systems: producing 250,000/location	3	12,900,000
Forklifts	3	350,000
Trucks	3	330,000
Working Capital		1,500,000
Estimated Income (Min \$45/Pallet)	Per Month	2,800,000
Estimated Income (Min \$45/Pallet)	Per Year	33,750,000
Estimated Income (Min \$45/Pallet)	5 Years	168,750,000
ROI	< 2.5 Years	>25%Annually

PARTIAL ADVISORY BOARD MEMBERS

- Previous VP of Chase (Ph.D., Yale: Thought at Columbia Business School)
- Retired VP of worldwide sustainable environmental program at Ford
- Asst. Professor of London School of Business (Ph.D.: Columbia Business School)
- Two Business owners
- Two Seasoned Executive

Disclaimer:

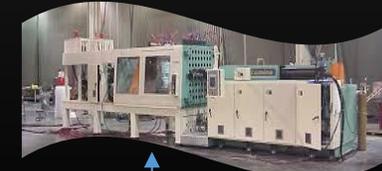
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