FREUDENBERG
PERFORMANCE MATERIALS

WASTE TO WORTH: AN ADVANCED RECYCLING "PET" PROJECT

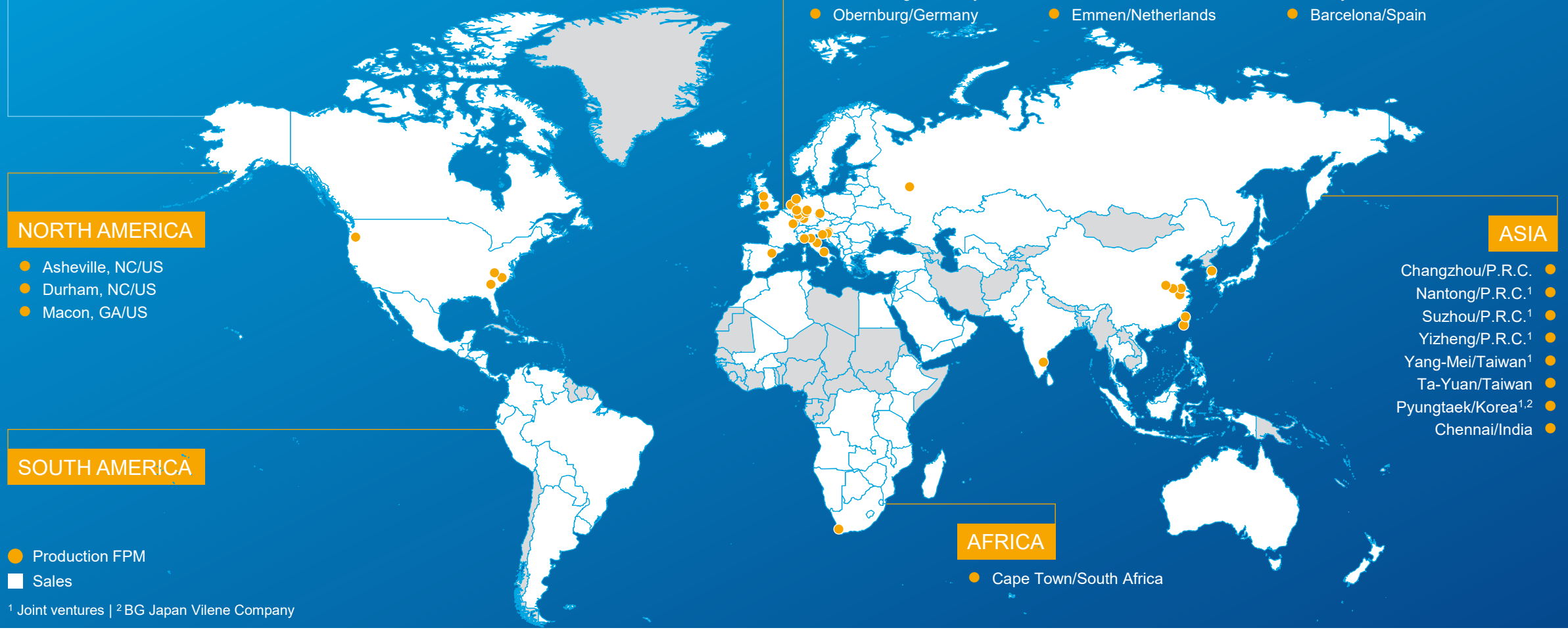
FPM Durham, NC, 2026
Evan Wagner, HSE

FREUDENBERG
PERFORMANCE MATERIALS

FPM GLOBAL ORGANIZATION

EUROPE

- Lomnice/Czech Republic
- Colmar/France
- Fulda/Germany
- Hückelhoven/Germany
- Kaiserslautern/Germany
- Neuenburg/Germany
- Obernburg/Germany
- Weinheim/Germany
- Cossato/Italy
- Novedrate/Italy
- Pisticci/Italy
- Sant'Omero/Italy
- Arnhem/Netherlands
- Emmen/Netherlands
- Ebbw Vale/UK
- Littleborough/UK
- Nizhniy Novgorod/Russia
- Lendava/Slovenia
- Mengeš/Slovenia
- Škofja Loka/Slovenia
- Barcelona/Spain



NORTH AMERICA

- Asheville, NC/US
- Durham, NC/US
- Macon, GA/US

SOUTH AMERICA

ASIA

- Changzhou/P.R.C.
- Nantong/P.R.C.[1]
- Suzhou/P.R.C.[1]
- Yizheng/P.R.C.[1]
- Yang-Mei/Taiwan[1]
- Ta-Yuan/Taiwan
- Pyungtaek/Korea[1,2]
- Chennai/India

AFRICA

- Cape Town/South Africa

Production FPM

Sales

[1] Joint ventures | [2] BG Japan Vilene Company

FREUDENBERG
PERFORMANCE MATERIALS

Business Group of Freudenberg Group

1938
Nonwoven invention

Germany
Headquartered

1,320.4
Mio. Euro sales in 2021

~. 5,000
Employees worldwide

30+
Manufacturing locations in 14 countries

+100
Countries with sales activities

FPM

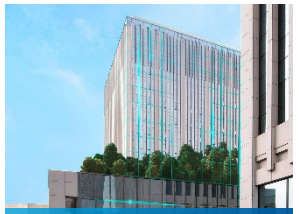
A global manufacturer and innovative pioneer in the field of technical textiles, nonwovens and fiber.
Market coverage with strong brands:

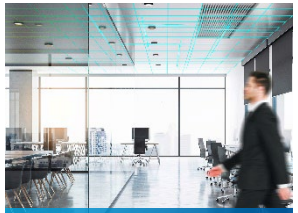
comfortemp®
colback®
colbonddrain®
enka®solutions
DRIPSTOP®
evolon®
lutradur®
terbond®
texbond®
Soundtex®
vlieseline® a brand of FREUDENBERG
MEHLER TEXNOLOGIES FREUDENBERG

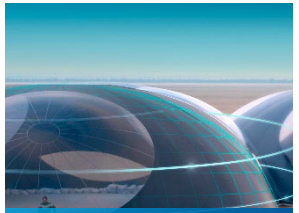


Market Expertise


AUTOMOTIVE


BUILDING & CONSTRUCTION


FILTER MEDIA


COATED TECHNICAL TEXTILES


HEALTHCARE

INITIAL SITUATION

- **PET** (PolyethyleneTeraphthalate) to make nonwoven fabrics.
- Generates waste.
  - Some recycled on site
  - Some too degraded and difficult to recycle on site.
  - Some too much capacity to recycle on site.
  - No known recyclers through traditional recycling methods

- Recycling capacity on site cannot handle all types of waste produced locally.

- Over 1,200,000 lbs (**Roughly 550 metric tons**) estimated landfilled in 2023



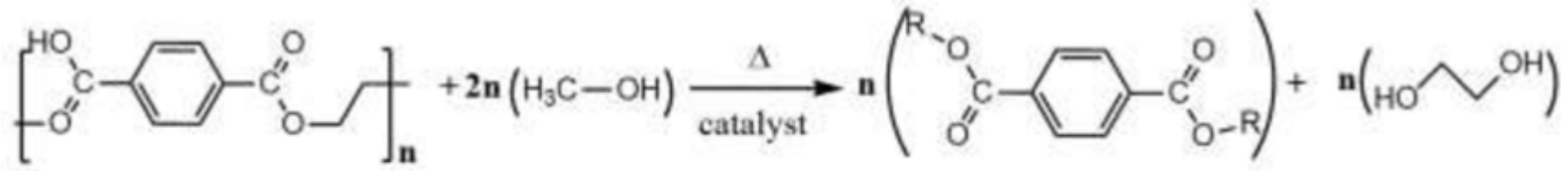
INNOVATION AND ADAPTION

Advanced Plastics Recycling

Degraded PET cannot be recycled through grinding / extruding / quenching in the way that high quality PET can be through our recycle line.

A relatively new process of “Advanced Plastics Recycling” is now in use through a methanolysis reaction, shown below.

The Dimethyl terephthalate from this process can then be transesterified into usable PET again.



Polyethylene terephthalate (PET) **Methanol** **Dimethyl terephthalate (DMT)** **Ethylene glycol (EG)**

DETAILS OF THE PROJECT

Project Goals

Find a recycler for our waste PET, especially degraded polymer waste

- Stop sending PET to landfill
- Reduce waste removal costs



Project Milestone Plan

- Find recycler who can handle our degraded polymer waste
- Establish logistics and
- Set up necessary on-site changes (bins, signage, etc.) to accomodate this change
- Train employees on new waste sorting requirements
- Full implementation in May 2024
- First full year in 2025

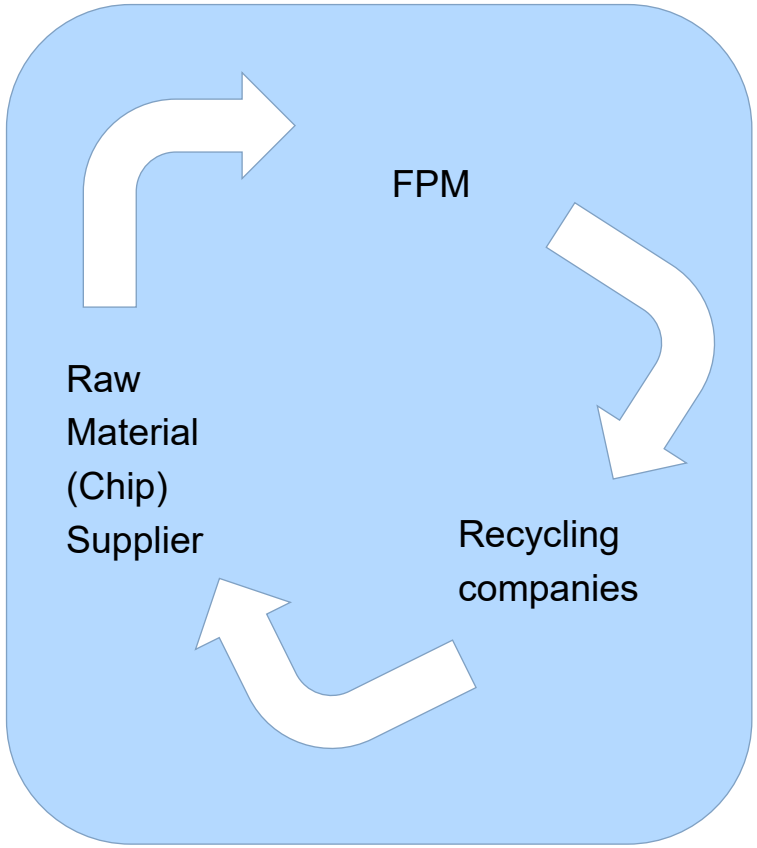
Challenges

- Relatively new recycling technology
- Few available service providers
- Material must be prepared by an intermediary before processing to advanced recycling facility

RESULTS

Advanced Chemical Recycling

Through **partnership** with our Waste Hauler, a local waste sorting company, an Advanced Chemical Recycling facility, and our Raw Material Supplier, our waste is recycled through Methanolysis of PET – then sent to our suppliers to be made back into usable raw materials, which are then sold back to us for further use.



Landfill Diversion

We **diverted** approximately 2.5 million lbs of PET from landfill in Durham in 2025

Total cost offset into low six figures after considering avoided landfill rates and payment for recycled materials.

PEOPLE

Topic

- Project initiated by supply chain group members who were concerned with our landfill contributions. This group continues to maintain the logistics of this program.

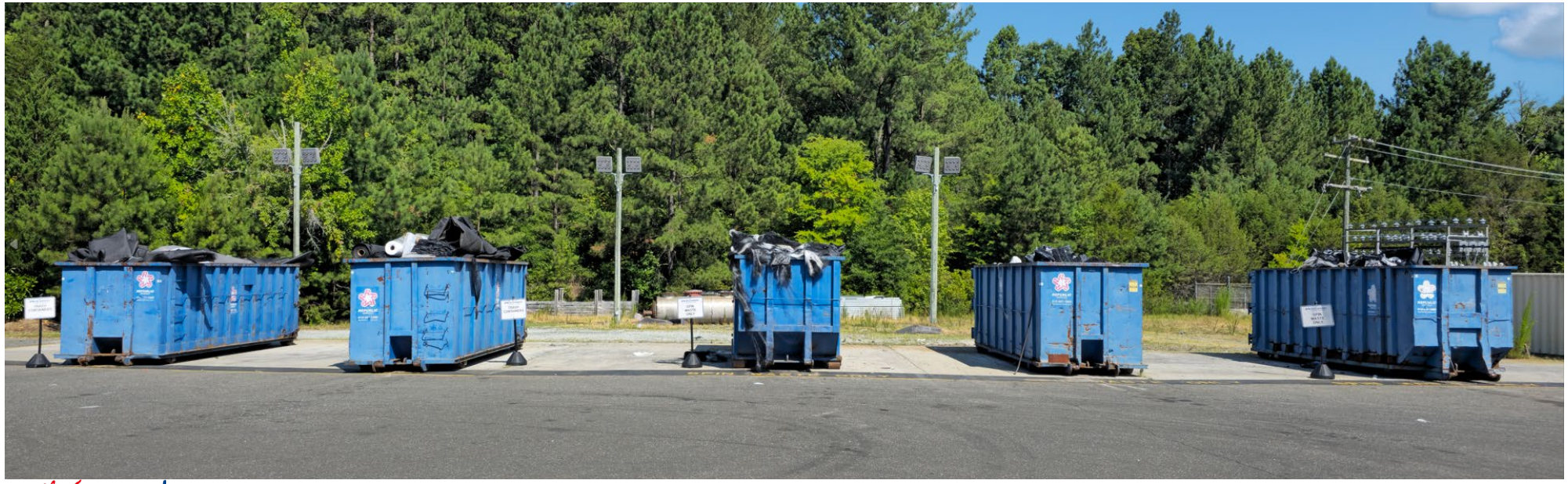
- Support from HSE and Operations/Maintenance to rearrange waste collection signage and support training of operations staff.

- Day to day management of waste is done by Operations Employees – Forklift operators, process technicians, etc.

LEADERSHIP AND PARTICIPATION

Monitoring by Supply Chain and Operations Manager

- Supply Chain is in frequent contact with our supplier and recycler to ensure we are not contaminating the waste stream.
- Operations Manager addresses any problems with contamination by the teams.
- Teams work together to ensure bins are hauled off when full and that waste material is placed in the right locations



THANK YOU