

Trends
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in
Post-Industrial Plastic
Post-Industrial Plastic
Recycling
Recycling

Custom Recycling Programs



- Sorting
- Shredding/Grinding
 - Pelletizing
 - Compounding
- Toll Processing
- Warehousing
- Trans-loading
- Baling
- Material Supply



Industrial Plastics Recycling Industry Influences

- Market Viability
- Raw Material Costs, Supply, Demand & their impact on recycled resin
- Resin pricing trends for virgin and recycled material
- Resin production trends for post industrial waste
- Market influences
- Market conditions
- Legislative activity impacting supply and demand
- Opportunities and threats
- Current strategies implemented by post-industrial material recyclers

Market Viability Factors

- **Supply**
- **Demand**
- **Raw Materials**
- **The Economy**
- **Resin Pricing**
- **Cooperation**



Market Viability

Industrial Recycling Industry Lifeblood



● Supply

- Steady clean streams of post-industrial scrap that can provide viable recycled finished products
- Strong and viable manufacturing/production environment

● Demand

- Desire for recycled production materials
- Strong economy and manufacturing in all sectors (housing, recreation, lawn and garden, automotive, housewares, etc)

Raw Material Costs

- Producer Capacity Utilization
- Inventories
- Compounds
- Recycled Material
- Additives
- Imports and Exports
- Natural Gas Reserves in the US
- Oil and other influencing products



Supply, Supply, Supply!

Why does industry recycle/recover scrap?

1. Recovery of previously valueless bi-products
2. Reduction in disposal costs
3. Reduction in use of higher priced resins
4. Trends in Green Initiatives are valued
5. Sustainability is no longer being ignored

Demand, Demand, Demand!

Desire for Recycled Materials:

- Reduces or replaces higher priced products
- Marketing use of products containing recycled materials
- More competitively priced products v. China, India
- Ability to compete with domestic virgin resin users
- More and more products becoming available
- Better quality as demand increases

Economy

The 2008 economic crisis :

- 50% drop in oil prices
- Decrease in the prices of virgin resin and subsequently the value of recycled plastic plummeted



Economy

- Drops in U.S. economic consumption, production of durable goods, production of nondurable goods, sales of light vehicles and production of motor vehicles
- U.S. housing starts dropped in 2009 because of the collapse of the housing market that began in 2008.



RESIN USE & PRICING TRENDS:

Virgin & Recycled

- **Summer of 2008 – Meteoric Rise in resin pricing**
- **Crash of 2008-2009**
- **Recovery**
- **Current Trends**
- **Future expected pricing - uncertain**

Where are we today?

- Reasonably stable market
 - Supply
 - Demand
 - Pricing
 - Significant attention on recycling



Specific Industry Trends

- **Fully Integrated Recycling Programs**
- **Closed Loop Recycling**
- **In-House Processing**
- **Advanced Recovery Investments**
- **Dedicated Recycling Staff**
- **Introduction of Lower Cost Alternatives**



Fully Integrated Recycling Programs

- What are they?
- Who can manage them? Choosing the right provider/recycler
- Success variables
- Leveraging best pricing
- Deliverables by recycling partner

Closed Loop Recycling



- **Who can do it?**
- **Implementation**
- **Viability/Success**
- **Factors – Quality, Cooperation, Focus and Investment**
- **Which products?**
- **Which recycling partner?**



In House Processing

Simple Recovery

- Press-side grinding
- Large capacity grinding
- Baling/Compaction
- In house washing, pelletizing, compounding
- Multi-plant product sharing, reintroduction globally
- Quality
- Support
- Investment
- Augmented by Toll Processing



Advanced Recovery Investments

Generators are investigating and implementing new methods and technologies for recovery and reuse

- Sortation and segregation implementation (simplified and advanced)
- Disassembly
- Size Reduction
- Color Sortation
- Material separation technologies (laminated, coated, blended, mixed)
- Dust/Fines Recovery
- Use of waste for energy (simple and advanced)
- Customer buy-back programs

Dedicated Recycling Staff

- Pays for itself in cost-recovery
- Assures quality and consistency
- Provides Champion to monitor and manage program
- Provides Clear interface for recycling partner
- Gives internal company perspective to add recycling targets
- Often correlates to Environmental responsibilities



Lower Cost Alternatives

- Internal Reuse as the first choice low cost alternative to virgin
- Grade specific recycled products
- Grade Replacement Products - Compounded
- Testing and approving new lower cost products to replace existing resins
- Material flexibility/agility (changing resins as needed)



Current Positive Trending

A Healthier Industry Emerges

- Processed and Brokered Volumes of Industrial Plastic . . . Conservatively reported by major players - 4.6 billion pounds in 2011. 2012 numbers look strong
- Up more than 25 percent vs. 2010.
- This is almost 40 percent higher than the amount reported in both 2007 and 2008.



Outlook: It's All Good

- Increased domestic demand for recycled material increases recycling opportunities.
- Increased Corporate Value. Green is a positive trend. There is desire and strong interest in doing business with 'Green' companies. Corporations are taking more responsibility for their waste and, therefore, increase their 'Industrial Ecology' in the eyes of the Consumer. There is an 80–90% reduction in energy consumption when producing recycled plastic compared to producing plastic from virgin materials.
- Increased Government pressure on industry to recycle-mandated recycling via public policy is another way to achieve a quantum increase in the amount of material being recycled in the industrial sector. EPR (Extended Producer Responsibility), landfill restrictions
- Increased cost-effectiveness realized by advances in quality recycling systems and programs.
- Increase in the power and 'voice' of Recycling Groups.





Public Pressure for Industry

- EPR programs

Extended Producer Responsibility (EPR) programs are a major potential way to increase recycling volumes. Such programs exist in some parts of Europe, but are just now increasing in the U.S. EPR standards require producers to be responsible for the disposal of their products

- Energy Conservation

There is an 80–90% reduction in energy consumption when producing products from recycled plastic compared to producing plastic from virgin materials.

Zero Waste Businesses are Leading the Way (>90% diversion)

- **Anheuser-Busch, Fairfield, CA**
- **Apple Computer, Elk Grove, CA**
- **Atlanta Zero Waste Zone**
- **Epson, OR**
- **Fetzer Vineyards**
- **Frankie's Bohemian Café, SF**
- **Greens Restaurant, SF**
- **Hewlett-Packard, Roseville, CA**
- **Honda**
- **Mad River Brewery**
- **New Belgium Brewery**
- **Pillsbury**
- **General Motors**
- **Playa Vista, LA, CA**
- **Ricoh Electronics**
- **San Diego Wild Animal Park**
- **Scoma's Restaurant, SF**
- **Subaru**
- **Toyota**
- **Vandenberg Air Base**
- **Vons-Safeway**
- **Xerox Corp**
- **Cascade Engineering, MI**
- **2800 Businesses in Japan**

All of these current, trending factors are helping to achieve a quantum increase in the amount of material being recycled in the industrial sector (Supply)

And in the attractiveness of recycled materials to be reintroduced back in to industry (Demand)

The future is Bright.

Now is the time to expand the horizons of recycling.



Plastics recyclers are showing greater creativity in finding materials they need to fill their plants' capacity and meet growing demand for recycled materials.

Suppliers are looking for more creative ways to use their bi-products and put them back into their own products.

Trend of In-plant recycling programs

Industrial recyclers are expanding locations and setting up operations in customer/supplier plants.

CHINA



Competitive and Changing:

- Because much of China's plastic resins are oil-based and U.S. resins are currently predominantly natural gas-based, high oil prices have often made Chinese virgin resins higher priced than those from the U.S., making recycled resins a lower-priced option for Chinese companies.
- Chinese recyclers also can convert U.S. recycled materials into recycled resins at a cost that is less than their virgin resin prices. This also makes it more realistic for them to take more commingled and contaminated materials.
- New enforcement imposed by the Chinese President have increased higher enforcement of restrictions/standards



Material and Recycling Solutions for Industry™

McDunnough, Inc.

Darren McDunnough

734-449-4008

www.McDunnough.com

darren@mcdunnough.com

