ELV and WEEE Plastics Recycling – Recovery Targets at Risk
ELV recycling - the core of the MGG business

MGG Car-Shredders in Austria and Hungary
Since the opening of the EU borders – loss of ELV’s

In Austria forecast 2017:

- 353,000 new cars registered
- 276,000 cars are de-registered
- Close to 60,000 ELV’s are shredded in Austria
- Some 217,000 ELV’s with unknown whereabouts

So in 2004 MGG decided to diversify in WEEE recycling
And Christian Müller-Guttenbrunn was honoured
With the Cow Bell Award during the IERC conference of 2017 in Salzburg

"Christian has won this award for his life's work, for the development of new recycling processes and the founding of new clean-tech companies in Austria and Eastern Europe in various fields, such as plastics recycling and metal sorting," said the IERC Steering Committee.
Plastics recycling – MBA Polymers Austria

- Founded 2004 as JV
- Constructed 2005
- In operation since 2006
- Capacity 50 kMT
- Producing PCR plastics
- 100% MGG since July 2017

++News: since Jan, 1st ++

MGG Polymers
Exponential growth of an “invisible” Pollutant

- Emitting CO₂ is free of charge
- It is a most urgent global environmental threat
- And.......this discussion decoupled from debates over toxics

February 2018: 408,35 ppm CO₂

For centuries, atmospheric carbon dioxide had never been above this line

1950 level

Current level

https://climate.nasa.gov/climate_resources/24/
Plastics volume used in the EU in Cars and Electronics

Converter Demand in Electronics and Cars is approx. 8.1 Mio MT’s
Average composition of

Many of these plastics are high value tech plastics
Scientific Approach

LCA PCR WEEE Plastic at MGG Polymers versus

1. Incineration of these plastics

   Recycling PCR WEEE plastics 4 times better than Municipal Solid Waste Incineration

2. Production virgin plastics

   Recycling PCR WEEE recycling option 6-10 times better than producing virgin plastics

If ELV and WEEE plastics recycling makes so much sense, why is there so little of it......

- It is difficult.........
Separation of plastic is difficult

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Water</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Magnesium</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Aluminium</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Titanium</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Steel</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Brass</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Copper</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
If ELV and WEEE plastics recycling makes so much sense, why is there so little of it?

- It is technically difficult........but absolutely possible
Two examples of electronic products with 100% MGG Polymers
Two examples of car components with 100 % MGG Polymers
If ELV and WEEE plastics recycling makes so much sense, why is there so little of it?

- It is technically difficult........but possible
- The legal framework makes it difficult
The complexity of the regulatory framework

- **UN Conventions**
  - Basel Convention -> transboundary shipments of waste
  - Stockholm Convention -> POP’s
  - Rotterdam Convention -> hazardous substances & chemicals

- **EU Waste Legislation**
  - EU Waste Framework Directive
  - EU Waste Shipment Regulation
  - EU WEEE Directive

- **Product Legislation and Listings**
  - EU General Product Safety Directive (GPSD)
  - REACH Regulation
  - Global Automotive Declarable Substance List (GADSL)

A continuous flow of new legal initiatives and... barriers
Legislation Overview Flame Retardants

Car components with possible flame retardants

- **Engine / Chassis**
  - PA, PP, PA, EPS foam
- **Electric/Electronics**
  - PP, PE, ABS, PBT, PC, PMMA, POM, PA
- **Interior parts**
  - PP, ABS, SMA, PPE, PU, PET, POM, PVC
- **Cables**
  - PVC, XLPE, PP, TPU, TPE
- **Seats**
  - PVC, PU, PE, PP

**Typical plastics used**

- **Engine / Chassis**
  - PA, PP, PA, EPS foam
- **Electric/Electronics**
  - PP, PE, ABS, PBT, PC, PMMA, POM, PA
- **Interior parts**
  - PP, ABS, SMA, PPE, PU, PET, POM, PVC
- **Cables**
  - PVC, XLPE, PP, TPU, TPE
- **Seats**
  - PVC, PU, PE, PP

**Regulations**

- **Annex XIV**
- **POP under Stockholm**
- **Restriction under GADSL**
- **Restriction under REACH**
- **No restriction**

**Source:** EFRA
As consequence of these complexities

- **Shredder Residues and Plastics from Shredder Residues**
  - Become listed as “POP” waste or even as hazardous waste
  - Cross-border transport with these wastes become increasingly difficult
  - Plastic recycling facilities do not have permits to take in hazardous wastes
  - There are even cases that the recycling of these plastics is not allowed anymore
  - Proposal deca-BDE POP threshold 50 ppm, implying the end of plastic recycling.

- **Most of the plastics ELV’s and WEEE however are**
  - Not at all flame retarded
  - And if flame retarded often with allowed substances

- **There is a missing legal certainty for the recycling industry**
  - Investors are hesitant to invest in this newly developing industry

The recycling targets set for ELV’s and WEEE are at jeopardy
And this morning we got this statement.....

Austrian Treatment Obligation Ordinance  plastic waste exceeding total Br content: 2,000 mg/kg - assumption that POP-limit is exceeded – destruction/irreversible transformation!

This would simply make plastic recycling impossible.
Plastic recycling a key contributor to the circular economy

We save approximately 1000 MT’s of CO₂ per employee per year
Circular Economy and ELV and WEEE PCR plastics

▶ Fast Track Notifications
  • For input material to compliant recyclers (Art. 14 WSR)
  • Secondary raw materials are raw materials
  • Allow highly mixed recyclable materials as from ELV’s and WEEE to move to recyclers
  • Plastics with BFR’s are not a hazardous waste

▶ Support the development of a EU recycling industry for PCR plastics
  • Based upon reward based positive incentives
  • Applying product legislation on secondary raw materials such as PCR content
  • Not applying product legislation on wastes

▶ Enabling factors for a step change in the development PCR plastic recycling
  • Realistic and balanced thresholds for legacy substances
  • Legal clarity and certainty with regards to thresholds & the classification of wastes

Our Wish: more support to this plastic recycling industry
Let’s our teeth in plastics from ELV’s and WEEE...

...but let’s not loose them on our way...