






# Lummus Circularity Portfolio

Chemical Recycling				Biodegradable Polymers
				
Large-Scale Plastic Pyrolysis	Small-Scale Plastic Pyrolysis	PMMA Depolymerization	Tire Pyrolysis	Biodegradable Polymers (PHA)
<i>Mixed-Waste Plastic → Pyoil</i>	<i>Mixed-Waste Plastic → Pyoil</i>	<i>PMMA → MMA Monomer</i>	<i>Waste Tires → Pyoil</i>	<i>Plant Based Oils → PHA</i>
<i>Centralized Plastic Recycling</i>	<i>De-centralized Plastic Recycling</i>	<i>Specific Hard to Recycle Plastic</i>	<i>Waste Tires</i>	<i>Waste Avoidance</i>
<ul style="list-style-type: none"> <li>✓ Continuous operation – <b>no char formation</b></li> <li>✓ ~25 KTA Reactor capacity</li> <li>✓ <b>High quality pyrolysis oil</b> product designed to integrate directly with ref/petchem assets</li> <li>✓ Can process wide range of plastic feedstocks</li> <li>✓ Can be <b>electrically powered</b> or fuel-fired</li> </ul>	<ul style="list-style-type: none"> <li>✓ Continuous Microwave Assisted Pyrolysis (<b>CMAP</b>)</li> <li>✓ 5 tpd fully skidded module</li> <li>✓ Powered by <b>microwave energy</b></li> <li>✓ Compact footprint</li> <li>✓ Low CAPEX / fast deployment</li> <li>✓ Distributed model – go to where the plastic is</li> </ul>	<ul style="list-style-type: none"> <li>✓ Continuous operation – <b>self cleaning system</b></li> <li>✓ Highly efficient poly methyl methacrylate recycling (rPMMA) technology</li> <li>✓ Extruder-based process with <b>high yield and high purity</b> MMA monomer product</li> <li>✓ Low carbon intensity</li> <li>✓ Compact footprint</li> </ul>	<ul style="list-style-type: none"> <li>✓ Continuous pyrolysis process - converts end-of-life tires into Carbon Black, Tire Pyrolysis Oil, and Steel</li> <li>✓ Low CAPEX / Turnkey solution</li> <li>✓ Commercial plant in Monterrey, Mexico in operation</li> </ul>	<ul style="list-style-type: none"> <li>✓ Polyhydroxyalkanoate (PHA) – <b>single use plastic replacement</b></li> <li>✓ Biodegradable polymer production from <b>plant-based oils</b>.</li> <li>✓ <b>100% biodegradable</b> in soil and water</li> <li>✓ Engineering in progress for 1<sup>st</sup> plant to be built in Georgia, USA.</li> </ul>