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New ITAD Revenue with Recovery as a Service

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Supply Chain Challenges for OEMs and Other Chip Consumers

- Fragility of global chip supply chain exposed by “black swan” events
- Accelerating demand for chips
- Longer lead times and increased prices
- Very limited security of domestic supply – stockpiling not cost-effective

Achieving supply chain resilience is a key priority going forward.



Relying Only on New Chips Is Not Sustainable

- Equipment replaced every 3-5 years contains chips with 18-20 year useful lives
- Manufacturing new replacement chips highly problematic for the environment
 - Very high GHG emissions – limited ability to reduce with process changes
 - Harmful operations used to obtain required critical metals
- Achieving net-zero emission goals requires reuse of chips vs. new chips

Mitigate environmental damage by creating a circular economy for chips.



Technology OEMs Are Prioritizing a Circular Economy

- Amazon: “We’re driving toward a net-zero carbon future....”
- Apple: “... plans to become carbon neutral ... by 2030....”
- Google: “... is committed to accelerating the transition to a circular economy....”
- Intel: “Keeping waste out of landfills is a critical priority”
- Microsoft: “...will reduce nearly as much waste as we generate....”

Sustainability is now a key driver in OEM decision making.



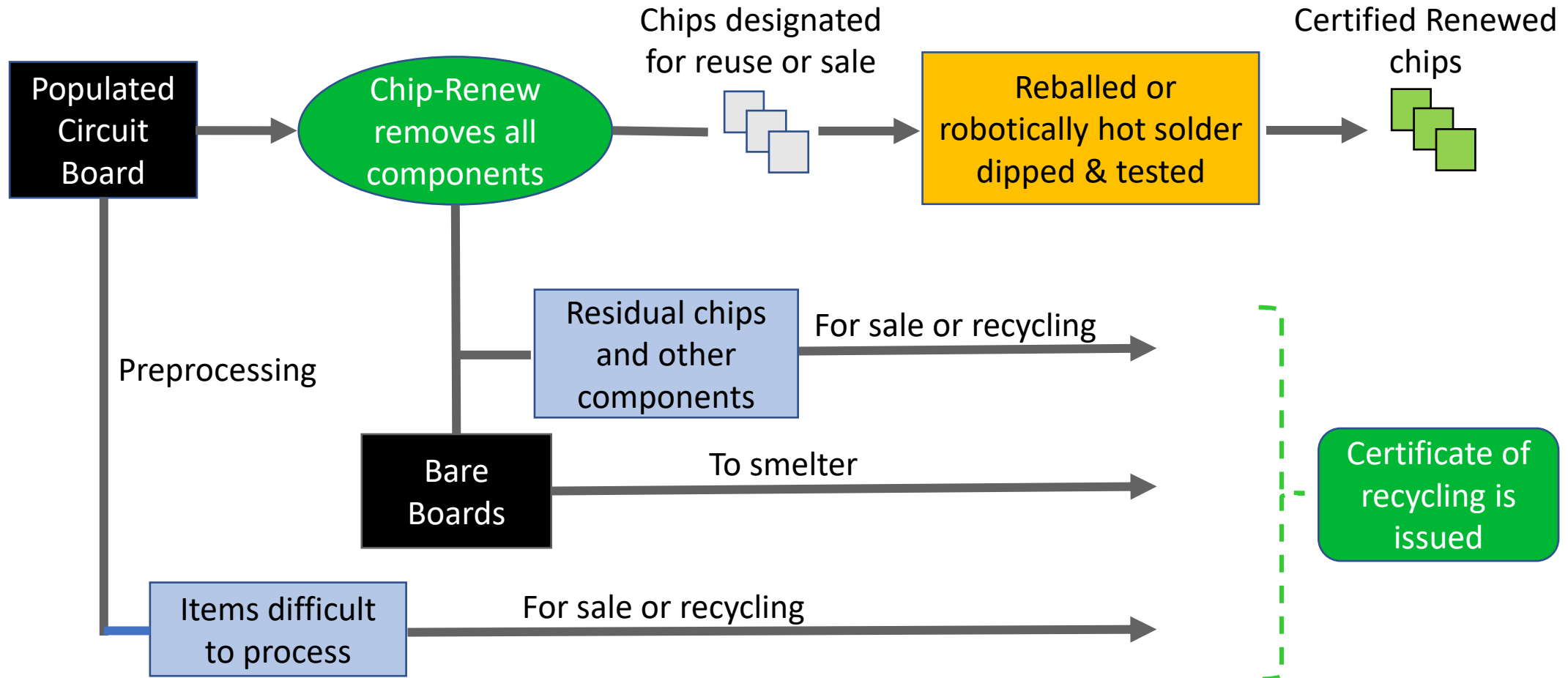
The Economic and Environmental Solution – Chip-Renew™

- Chips removed from PCBs using a thermofluid without cutting or pulling
- No harsh chemicals, burning, or toxic discharges
- GHG footprint 97% less than GHG footprint for new chips
- Chips reballed or robotically hot solder dipped and tested
- Returned as *Certified Renewed* chips for reuse or sale within 4-6 weeks

The benefits of Chip-Renew are available through Recovery as a Service (RaaS™) or through licensing the technology for operation in your site.



Process Flow to Produce Certified Renewed Chips



All components are removed and processed for their highest and best use in a circular economy.

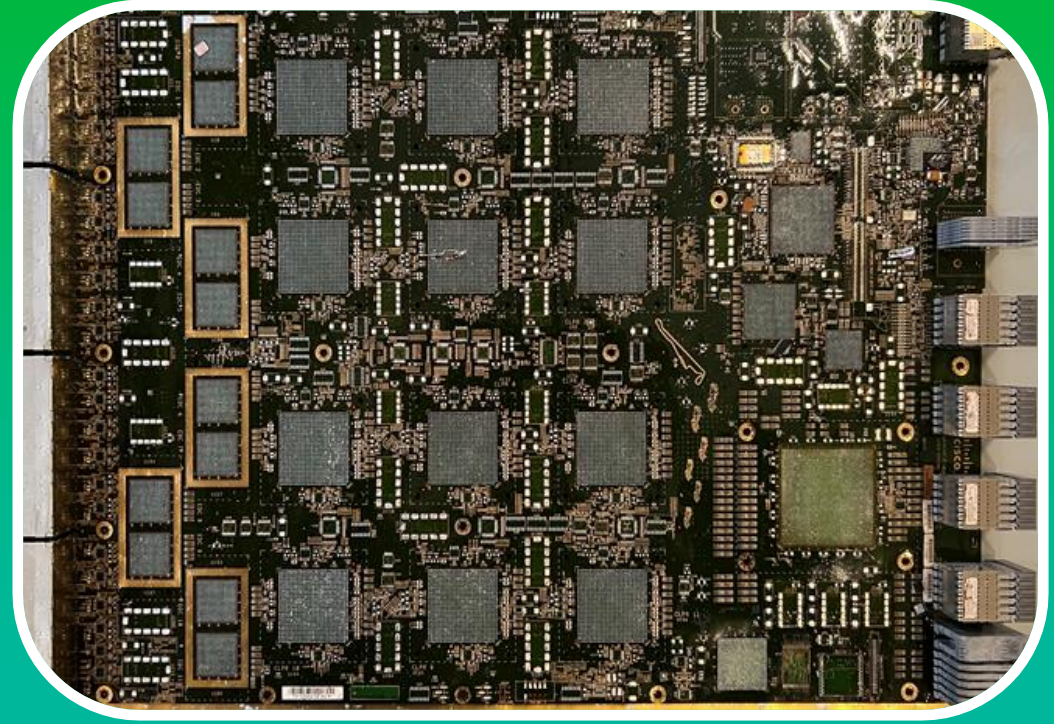


Chip-Renew Removes All Chips from Boards

Before



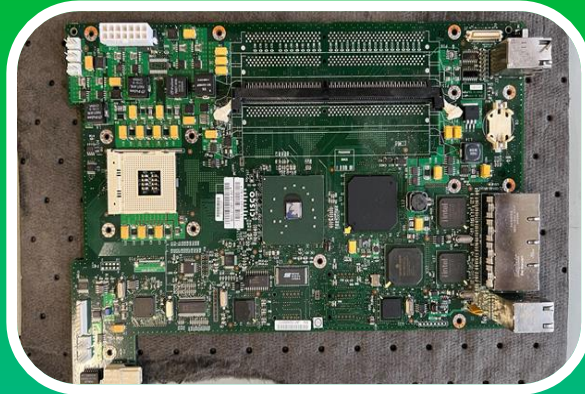
After



Process Works on PCBs of All Sizes

Before

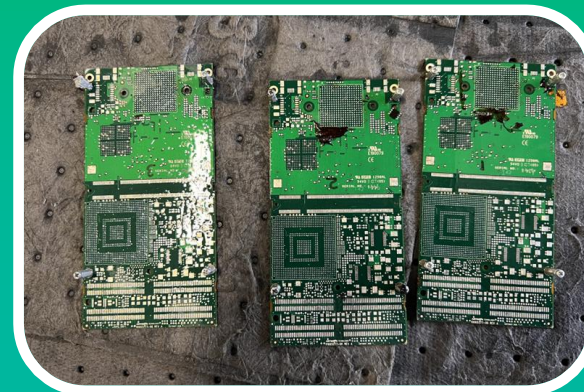
Medium Board



Small Boards

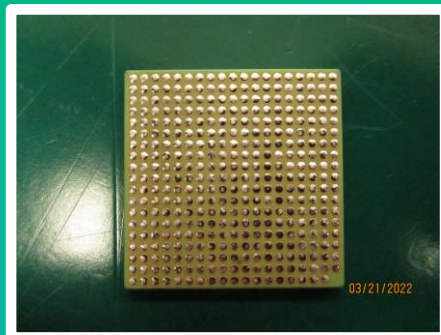
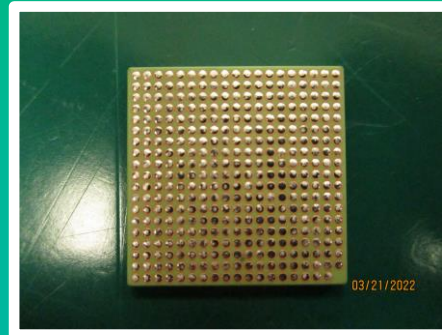
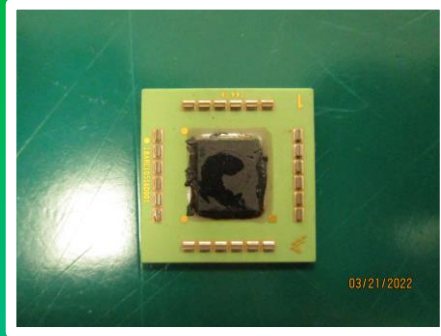


After

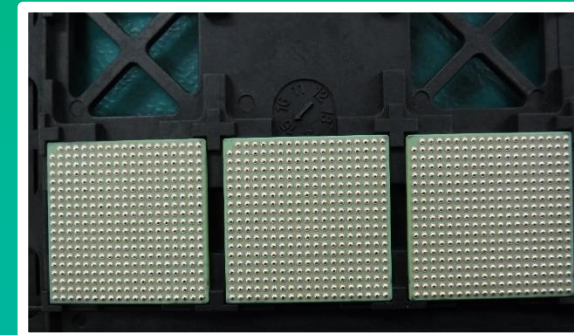
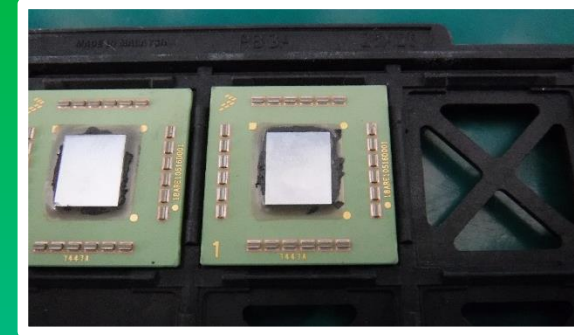


Chips Are Tested for High Reliability

Recovered BGA chips ready for
reballing and testing



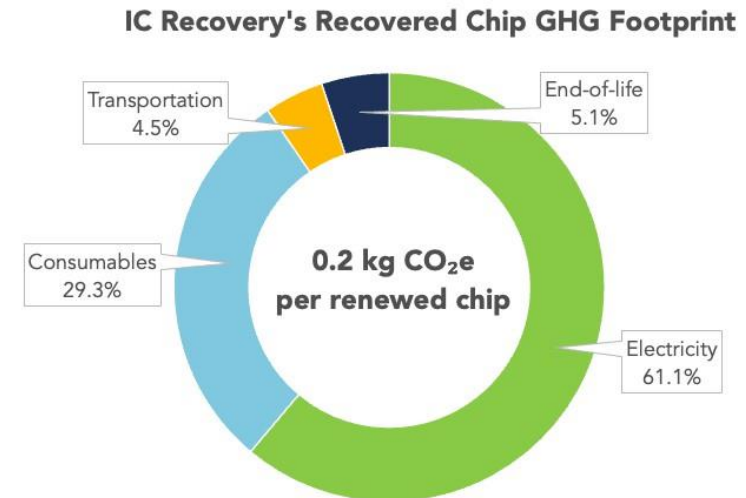
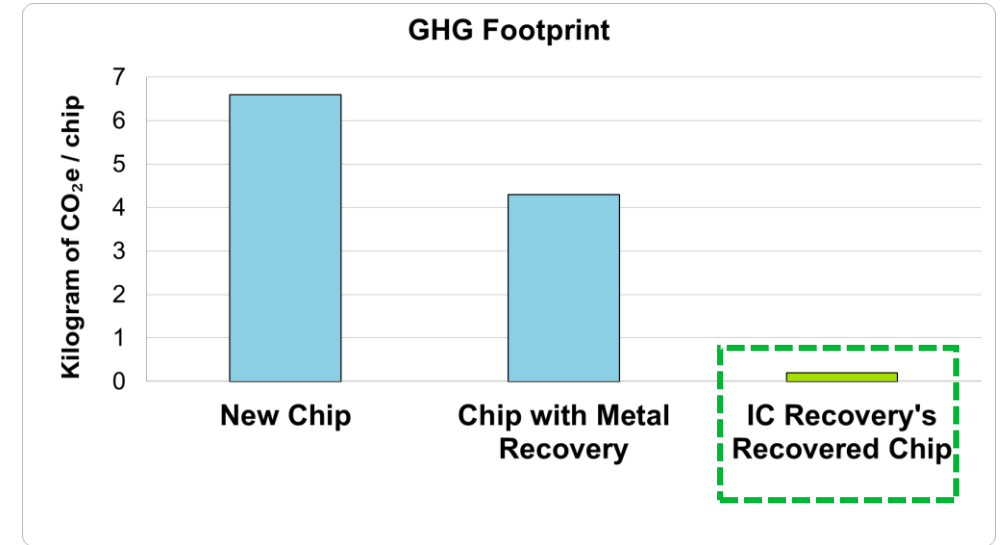
Certified Renewed chips



Environmental Advantage of Using Chip-Renew

- GHG footprint 97% less than the GHG footprint of a new chip
- Every 1,000 chips recovered avoids 6.4 MT of CO₂ = driving 16k miles in a car

Help OEMs and their customers achieve sustainability goals.



Chip-Renew Offers Multiple Points of Value

- Reduces lead times – 6 weeks vs. 6-12 months
- Lowers chip cost for same functionality and reliability
- Helps achieve sustainability goals
- Expands source and dependability of supply
- Positions for compliance with critical mineral sourcing requirements

Attract more customers with a strong value proposition.



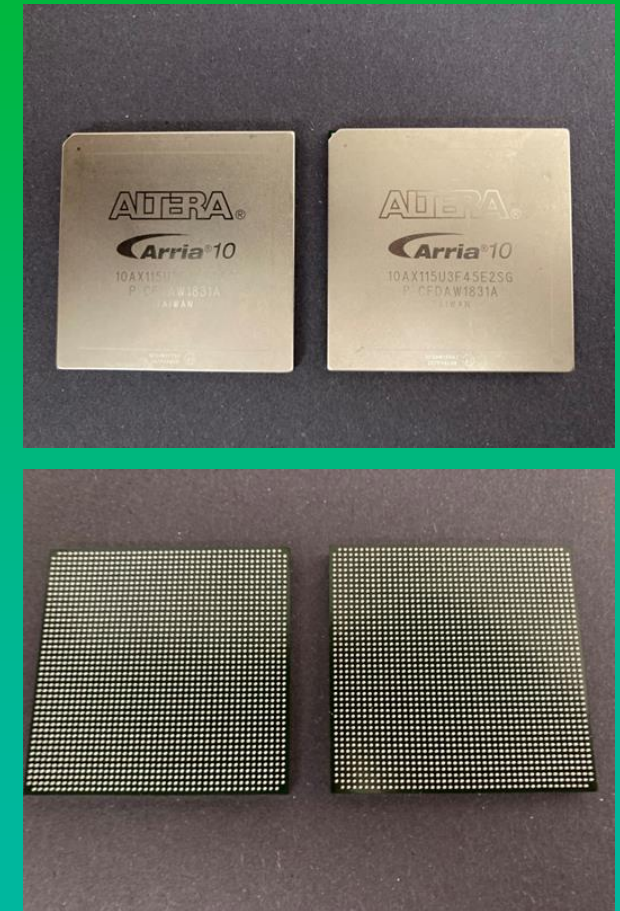
Revenue and Cost Reduction Opportunities

- New or expanded revenue streams:
 - Sale of refurbished products
 - Sale of Certified Renewed chips alone
- Cost reductions achieved by:
 - Extending life of existing equipment
 - Using lower cost chips in equipment

Get more value from PCBs.



Certified Renewed chips



Bottom Line – With Chip-Renew You can:

- Provide critical support to your customers' efforts to reduce their carbon footprint, achieve sustainability goals, and comply with critical metals sourcing requirements.
- Attract new customers and derive more value from processed materials.



Questions?

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