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Project: Write/edit industry articles for the association's trade Journal ASSET2.0, published six times a year. This is just one example

The Center for Remanufacturing and Recovery: *The New Profit Epicenter for Investment Recovery?*

Remanufacturing is like the Rodney Dangerfield of sustainability. It deserves more respect than it currently is getting. Let's say you Googled "sustainability" and you got slammed with over 115 million hits. But Google the term "remanufacturing" and maybe you'd get half that much. Remanufacturing, arguably the definition of sustainability, receives relatively little market or media attention. Now, that's a real head-scratcher considering that the remanufacturing industry reached \$43 billion in revenue and employs over 180,000 workers in the United States. Most people are unaware of this dynamic industry that fuels the circular economy by closing the loop of material flow, reducing energy use and waste disposal.

And most IR professionals may have heard about remanufacturing, but their scope of asset disposition may not include it.

Not yet.

But that's changing thanks to the R&D advances being made at the Center for Remanufacturing and Recovery in Rochester, New York.

First – what is and is *not* remanufacturing?

A big misconception, especially among consumers, is that remanufacturing is the same as "recycling" or "refurbishing." It is not.

Remanufacturing is a comprehensive and rigorous industrial process. It rebuilds a product to specifications of the original manufactured product using a combination of reused, repaired, and new parts. So, the remanned product is guaranteed "like new" or "better than new," with high performance and quality specifications – and at a fraction of the cost of a newly manufactured product.

Some of the most commonly remanufactured product categories are:

- ***Aircraft components***

- *Automotive parts*
- *Electrical and electronic equipment*
- *Engines and components*
- *Medical equipment*
- *Office furniture*
- *Printing equipment*
- *Restaurant and food-service equipment*

As the remanufacturing industry continues to grow and the demand for components expands, IR departments could find a new market in their surplus inventory for materials used in the remanufacturing process.

The Future of Remanufacturing Lives in Upstate New York - Today

The Center for Remanufacturing and Resource Recovery (C3R®) at the Rochester Institute of Technology is at the frontier of research and development for the remanufacturing sector. Globally recognized for its cutting-edge work, the Center brings together top thought leaders and technicians from industry, academia and the government to advance remanufacturing within the evolving circular economy. Since 1991, C3R® has worked to develop, test and implement efficient and cost-effective remanufacturing processes. The Center also helps design products that have minimal negative impact on the environment.

Golisano Institute for Sustainability and RIT

If you were to visit C3R®, you would realize that it's part of something much bigger - the Golisano Institute for Sustainability (GIS). And if you visited GIS, you would realize that it's part of something much, much bigger - the Rochester Institute of Technology (RIT).

For over 25 years, the Golisano Institute for Sustainability (GIS) has been dedicated to the economics of sustainability and the global competitiveness of the manufacturing sector. GIS is a leader in industrial sustainability research, education, development and technology deployment.

GIS is located on the campus of Rochester Institute of Technology (RIT), a world-class university with nine colleges emphasizing career education and experiential learning.

And right smack dab in the middle of all this learning, research and innovation sits The Center for Remanufacturing and Resource Recovery – or C3R®. It conducts independent research on remanufacturing technologies, design for remanufacturing, logistics, policy, and business operations. The Center works with the Remanufacturing Industries Council and functions as its research and development arm, both nationally and internationally. In fact, it is the only organization of its kind focused exclusively on remanufacturing.

An Interview with Dr. Nabil Nasr

ASSET 2.0 had the privilege to interview Dr. Nabil Nasr, Associate Provost and Director of the Golisano Institute for Sustainability and founder for the Center of Remanufacturing and Resource Recovery in 1999. Dr. Nasr stated that C3R® is first and foremost a technology organization i.e., they develop technologies or equipment that facilitates the re-utilization of components. Over the years, they have worked with a variety of industry and government sectors.

He shared an early success story when The Center was working with the US Navy. An old ship was destined for the scrap yard. The challenge was to transform the aged vessel into a new one – at a much lower cost. By comparison, a new ship built from scratch would cost more than 80M dollars, but through the research and technological innovation at The Center, they were able to utilize many of the key elements to make the old tub *new*. And not just in looks, but also upgraded to the strict performance and quality specifications of the Navy. And the price tag? **4.5M dollars**. As Dr. Nasr stated, *“This was a perfect example that saved a lot of money and took advantage of existing assets to convert it into something different. And remanufacturing got it back to like new condition.”*

The Center has also worked with companies to help them design products for remanufacturing. One example several years ago was for Kodak and their single-use camera. Although initially designed as a disposable product, The Center assisted Kodak with a design that included reusable camera components. Dr. Nasr also added that this same kind of ‘designed for remanufacturing’ model was utilized for the printing industry, most notably for large and small printers and toner cartridges.

Tour 'The Center'

A few years ago, MSNBC's *Morning Joe* did a video segment that went inside The Center for Remanufacturing and Recovery for a look-see. [{Click below to view}](#)

<https://www.msnbc.com/morning-joe/watch/how-remanufacturing-is-booming-across-the-us-365519427925?v=b>

In our interview with Dr. Nasr, we asked him what we would see if we toured the labs today. He responded that they have two facilities; the larger one housing a jet that is undergoing testing for a major airline. In fact, The Center has in-depth experience with aviation remanufacturing. They will take an older aircraft that is still in service and study the top aging components needed for remanufacturing and modernization. The goal is to extend the life-cycle of the aircraft until the replacements are ready and then further prolong its service via 'remanned' parts.

You would also see vehicles or just their transmissions hooked up to machines that mimic actual road conditions. The machine records valuable data for testing a variety of fuels, the impact of emissions and the life cycle of the engine.

Wall-to Wall Research

Engineers here have decades of research experience from virtually every aspect of modern remanufacturing — including analysis of raw materials through sustainable production design and evaluation of end-of-life products. Deep industry experience and technical capabilities enable C3R® to deliver consistently on-target solutions to reman customers worldwide with capabilities including:

- *Condition Assessment*
- *Materials Aging and Restoration*
- *Product Life-Cycle Engineering*
- *Integrated Health Monitoring*
- *Sustainable Design Methodologies*

State and National Awards

The Center for Remanufacturing and Recovery has been recognized by state and national organizations for its efforts, in honor of its leading research in the field, C3R® received the 2002 New York State Governor's Pollution Prevention Award,

the 2004 New York State Environmental Excellence Award. It also was awarded the National Pollution Prevention Roundtable's (NPPR) Most Valuable Pollution Prevention (MVP2) achievement in 2006 for improving component reuse during the remanufacturing process.

Looking to the Reman Future

Today, the manufacturing world is in a somewhat contradictory stage. Product life cycle is becoming shorter due to the fast pace of producing new technology. We also have products that are designed for mega durability that last longer than their use cycle. Remanufacturing is poised to benefit on both fronts as it can take these products and modernize them via reman technology.

In addition, remanufacturing's value proposition will become even more important as raw materials become increasingly scarce and...*expensive*. That factor will almost certainly drive future demand for reusable components and help fuel the circular economy initiative.



“Across the nation and around the world, cleaner production, clean tech and adoption of a circular economy are recognized as critical drivers to a prosperous future.”

Nabil Nasr, CEO - REMADE Institute
Associate Provost and Director
RIT Golisano Institute for Sustainability

And speaking of fuel - Dr. Nasr is also the CEO of the [REMADE Institute](#), dedicated to improving U.S. manufacturing competitiveness. The Sustainable Manufacturing Innovation Alliance was selected by the U.S. Department of Energy to lead its new Reducing Embodied-Energy And Decreasing Emissions (REMADE) Institute. This national coalition brings together leading universities, trade

associations and companies to pioneer new clean energy initiatives to help strengthen the U.S. manufacturing competitive muscle.

By bridging the knowledge gaps and barriers that prevent greater material recycling, recovery, remanufacturing and reuse, the REMADE Institute seeks to motivate industry investments needed to advance technology development. This investment in turn, will support the U.S. manufacturing eco-system through less fuel consumption and clean energy alternatives.

Innovations in Remanufacturing

Remanufacturing is not a new process, but it has innovated the technology utilized in product condition assessment – simply to evaluate if a product can be utilized multiple times. The Center develops testing and validation equipment for defects found in a final product. They also add their expertise to forward-thinking companies on future products such as construction equipment that can be designed for remanufacturing down the road.

Remanufacturing Getting Respect

Remanufacturing is losing its Rodney Dangerfield ‘no respect’ image...and it’s long overdue. Now more than ever, ‘reman’ is proving its two-fold value proposition for investment recovery professionals; 1.) untapped revenue and 2.) sustainability support. Learn more about the [Center for Remanufacturing and Resource Recovery](#).