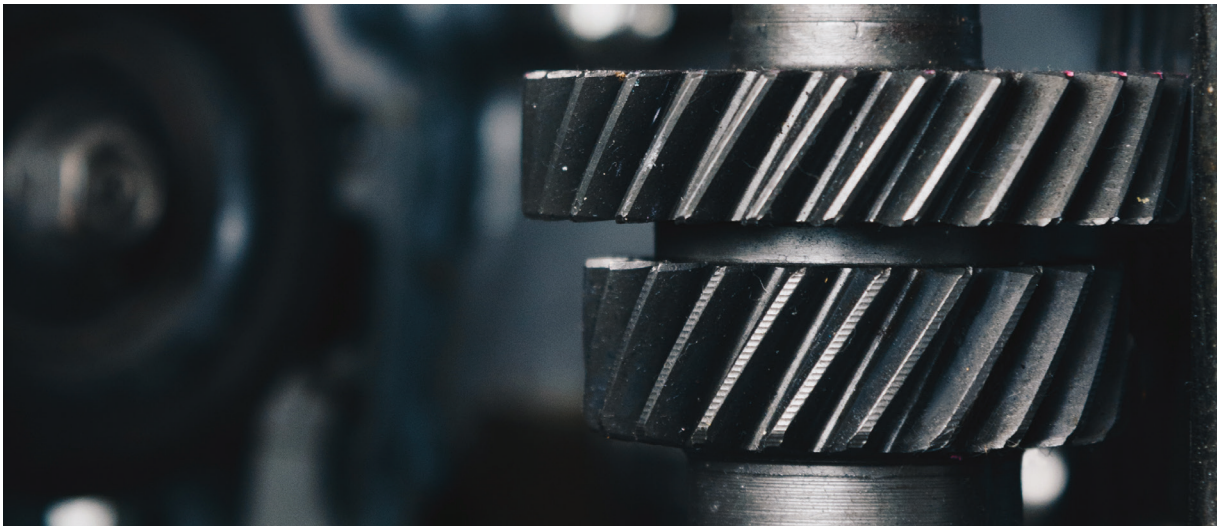


A close-up, high-angle shot of industrial machinery, focusing on several interlocking gears. The gears are dark, possibly black or dark grey, and are mounted on vertical shafts. The background is blurred, showing more of the machinery in a factory or industrial setting. The lighting is dramatic, with strong highlights and deep shadows, emphasizing the metallic textures and the precision of the gears.

Refurbishment:
**The road to
success**

Introduction

Recent market trends are showing a transition from ownership to usage and a rise in pre-owned asset¹ sales. These two trends form the basis of the circular economy, a concept that includes various closed material loops such as reuse, refurbishment and recycling.



The circular economy has both environmental benefits, in particular a reduction in resource exploitation, waste and carbon dioxide emissions; and economic benefits, most importantly optimized utilization, equipment usage through multiple life cycles and the development of new business models.

The expectation is that in the coming years, more manufacturers² will start to develop refurbishment capabilities, leading to increased volume in refurbished asset sales.

Though refurbishment business is predicted to show future growth and has huge potential for manufacturers, it is currently underutilized: many manufacturers seem to be struggling with its implementation and definitions of different types of second-life assets are often used interchangeably, creating misconceptions and misunderstandings amongst manufacturers and customers³ alike.

Scope of this whitepaper

This whitepaper aims to deepen the understanding of the refurbishment concept and the organizational implications of starting a refurbishment business. Definitions are clarified, an overview of key success factors given, organizational implications considered and, finally, a checklist provided to manage the process of setting up a refurbishment business.

“The added value of refurbishment is that customers and manufacturers benefit price-wise without compromising on quality.”

Geert Couckuyt

Service & After Sales Manager, Dewulf



1. The term 'asset' refers in this paper to equipment, devices, systems, units or products produced by a manufacturer.

2. The term 'manufacturer' refers in this paper to any company designing, producing and/or offering assets to end-users.

3. The term 'customer' refers in this paper to business end-users of assets.

Refurbishment is an important element of a resource-efficient manufacturing process and a key concept within the circular economy. By keeping products, components or materials in a closed-loop supply chain as long as possible, raw material use, energy usage and emissions can all be significantly reduced.

In addition to its environmental benefits, refurbishment also provides economic benefits and opportunities, such as the creation of highly-skilled jobs, maximization of production capacity and company growth.

Refurbishment in general has attracted more attention in recent years, yet remains underutilized by manufacturers. Our recent research in this area found that the definition of refurbishment is unclear and often confused with remanufacturing. The terms are frequently used interchangeably or in parallel, causing apparent misunderstanding amongst manufacturers and their customers. This paper therefore aims to provide a clear definition of refurbishment.

There is also a distinction to be made in the maturity stage different manufacturers have reached. While some are already engaged in refurbishment activities, others are having problems starting or maintaining their refurbishment business, or are still investigating the area.

Embracing refurbishment within its business model helps a manufacturer achieve higher profit margins, by giving products and parts a second or third life. It also enhances the manufacturer's environmental credibility in the eyes of customers, positioning it as a greener and more sustainable business, which can potentially deliver both strategic advantage and increased market share.

Leasing can benefit manufacturers with good refurbishment processes, both by helping them keep a grip on their assets and by optimizing an asset's value through multiple life cycles. Provided they have an efficient recovery and refurbishment process in place, companies can benefit from a second or third income stream on next-life materials and products.

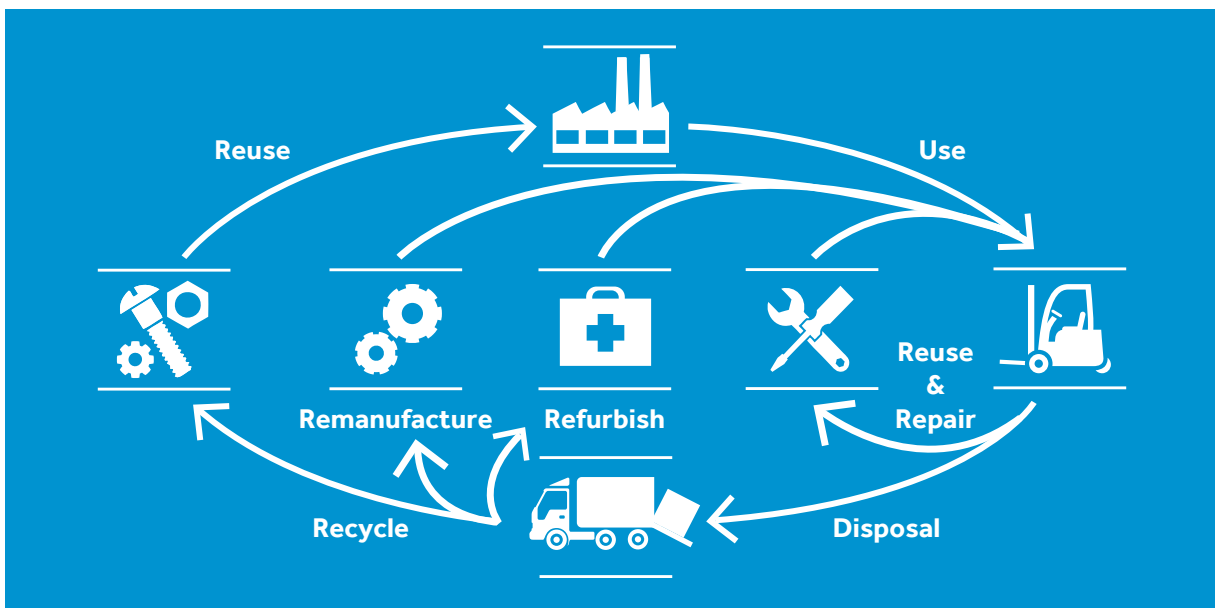


Figure 1: Refurbishment as one of the main elements of life cycle asset management and a key concept within the circular economy.

Clarifying definitions

Lack of clarity in the definition of the terms 'used', 'refurbished' and 'remanufactured' can cause confusion. This can potentially lead to international trade barriers and negatively affect consumer perceptions⁴, as products and parts can be seen as waste, rather than valuable inputs in the refurbishing or remanufacturing process.

Reused

"Reused" can be defined as simply reusing a product that has been cleaned but otherwise not undergone any modifications. A reused product, or its components, is put back into use for the same purpose for which it was originally designed. In the world of capital goods, manufacturers, dealers and resellers define reuse as 'selling on an "as is" basis'.

Refurbished

"Refurbishment" can be defined as bringing used products up to a certain, pre-determined, quality standard. It involves the replacement of worn and critical parts, and aesthetically making the product look like new. The level of refurbishment and "like-newness" depends on various factors, such as the manufacturer's and the industry's standards, the asset type, and relevant technological advancements. A refurbished asset may have limited improvements to functionality and slight malfunctions may be acceptable. It usually entails no changes to the original design and only a limited warranty is offered.

Remanufacturing

"Remanufacturing" can be described as the process of acquiring and restoring/transforming used products (i.e. non-functioning, discarded or traded-in products) to, at least, a like-new condition, with matching performance levels and (usually) a warranty equal to that of a new product. This means taking the entire product apart and replacing all worn parts. Remanufacturing can include technical upgrades (of both hardware and software) and changes to the original design. In order to make a clear distinction within the portfolio, remanufactured assets may be assigned a new serial number. Remanufacturing is overall costlier than refurbishment, and generally considered to be as good as new; or even better than the original thanks to, for example, upgrades.

	Reused	Refurbished	Remanufactured
Definition	Reusing a product for the same initial purpose without any modifications.	Bringing a used product up to a certain, pre-determined quality level by replacing worn and critical parts, and making it look like new.	Restoring or transforming a used product to, at least, a like-new condition, with performance levels matching (or even exceeding) those of a new product.
Aesthetics (look)	Used	Like new (or almost new)	Like new
Warranty	None	Limited: 3-6 months	Full: 6-12 months
What's done to the machine	Cosmetic change (cleaning, painting, minor repairs on broken critical parts) and making it functional.	Cosmetics and replacement of worn and critical parts. Software upgrade.	Substantial renovation. Asset taken apart and rebuilt with used and new parts. Possible technological upgrades.
Quality	"As is" and in working condition*	"Like new" (or almost new) compared to original product.	"Like new" or better than original product, due to upgrades and closeness to same new product.
Serial number	Original	Original	Original or New
Costs	Minimal	Depends on degree of refurbishment	Relatively high

*This definition is applicable in the B2B / business end-customer segment.

4. Disclaimer: The intention is to establish a definition that can be used across several industries. However, this can vary significantly depending on asset type and/or manufacturers' standards.

The organizational implications of refurbishment

This section summarizes the aspects that need to be taken into account in order to establish a sustainable and profitable refurbishment business.

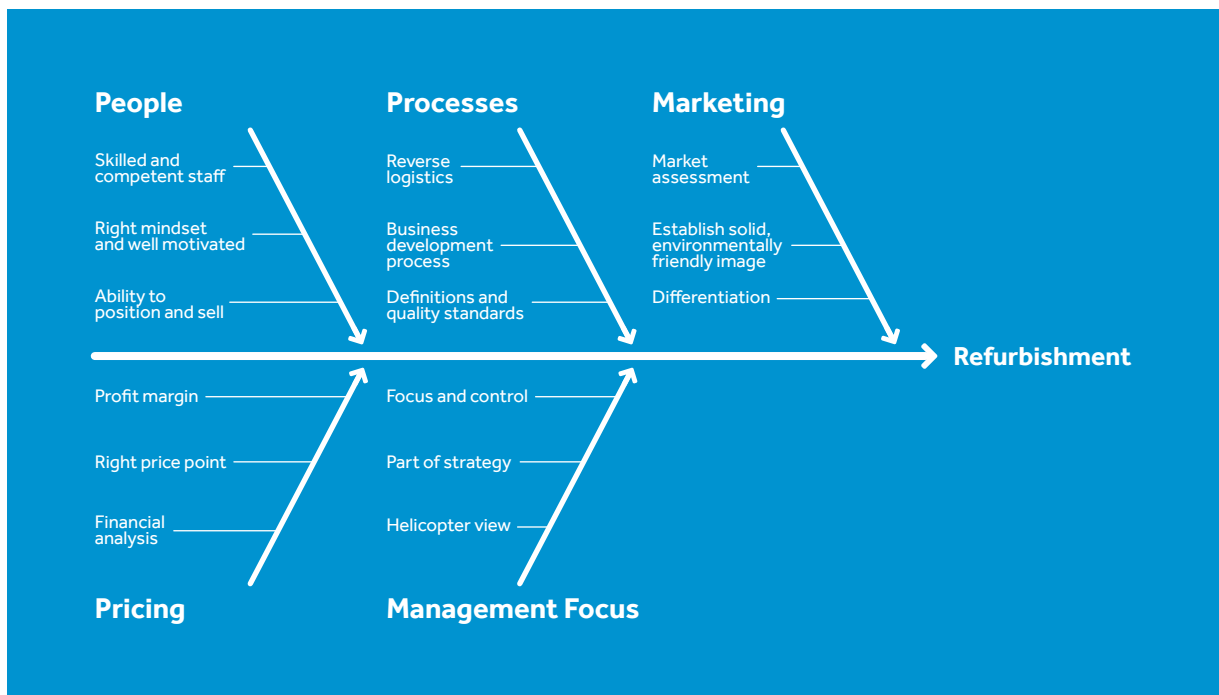


Figure 2: The organizational elements identified as critical in assessing the feasibility of the refurbishment business.

People

Before embarking on refurbishment, a manufacturer needs skilled, competent staff who are knowledgeable, have the right mindset and are well-motivated. You also need people who have the ability to position the equipment and sell it to the market. Selling refurbished is a different and sometimes more cumbersome process than selling new equipment. It can also be given a spur by having the right sales incentives for refurbished assets.

Processes

Setting up a good reverse logistics process is critical for return flows but also for to-be-recycled products. A manufacturer should consider how they can retrieve the resources and products they want to refurbish, approaching this resource challenge from

the beginning of the product or component's life cycle. These return flows should be sustainable and can come from trade-ins or buy-backs. Typically, still relatively little attention is given to this process in most countries and industries.

As a manufacturer, you should also look at the entire business development process, from the beginning to the end of a product or machine's life. The process of refurbishment should be as controlled as possible. Definitions and standards also need to be established, and continuously improved through learning, customer feedback and benchmarking against other OEMs. Standards need to be adaptable because circumstances and customer requirements change, and experience evolves.



(Re-)Marketing

Before setting up refurbishment, a manufacturer should assess its market. Read market studies, determine market size and segments, look at growth potential and possible competitors (who can be OEMs or third parties). Legislation should also be checked, as it can differ per country and market.

There is little point in trying to push refurbished assets at the wrong customer base. So perhaps the most critical element of this assessment is checking beforehand who your customers are, and mapping their demands and needs, including their motivation to buy refurbished instead of new.

Manufacturers should also establish a solid, environmentally-friendly brand image to maintain and create trust amongst customers.

Finally, refurbished assets should be well differentiated to prevent cannibalization of new assets. It should also be transparent what the actual differences are compared to new assets, so that customers have the right expectations, can make informed decisions and are ultimately more likely to be satisfied with their product.

Pricing

Refurbishment can contribute significantly to additional sales. Setting the right price-point is a very important element, as is setting a limit to the costs involved in refurbishment. One way to establish the right price-point is to develop a business case, and determine if it makes sense and is feasible. At the same time, the set price-point must of course be acceptable to your customers.

Management focus

It is also key to have focus at management level: from board level down, refurbishment should be part of top management strategy, and leaders and managers should think of refurbishment as a key strategic choice. Having adopted a helicopter view across the entire operation, top management should identify the right strategy and vision, and then ensure that this is communicated and trickled down to all levels of the company.

The 7 good habits of a highly-effective refurbishment business

Competent staff

Refurbishment requires a different (and sometimes higher) set of skills than needed to produce new machines. Employees should therefore be knowledgeable about refurbishment, have the right mindset and be well motivated. Clearly defined processes, protocols and instructions need to be in place, and staff trained accordingly. Besides technical staff, having the right sales people is also crucial, since the positioning and sale of a refurbished asset is quite different than for a new one. So the skillsets of sales people need to be aligned accordingly. The right level of focus on second-life asset sales can be supported by creating sales incentive schemes for the sales force.

“Refurbishment of our machines requires highly-skilled people with a good mindset.”

Emanuele Giacomini

Manager Second Hand, Tetra Pak



Understanding market and customer needs

Knowing the market and the customer's needs is the key to success. Assess the market and industry by performing a comprehensive analysis of possible strengths, weaknesses, opportunities and threats (SWOT). Knowing who your market competitors (OEMs + third parties) are is essential. Manufacturers must also determine whether their existing customers are willing to buy refurbished assets and identify possible new target groups.

“On the marketing side, analyze your customer base, check what customers want and then choose the appropriate operational setup.”

Klaus Hieronymi, Startegist, HP



Correct market positioning regarding price, quality, customer perception and warranty

A manufacturer who has an alternative portfolio alongside their new equipment portfolio gives customers a buying choice. Positioning the refurbished assets correctly in the right market is therefore crucial. This includes:

- setting the right price-point (i.e. a price that delivers the desired profitability but is acceptable to the customer);
- establishing quality standards or levels (e.g. Bronze, Silver or Gold) and clearly disclosing these to the customer;
- creating a sales channel for proper (re-)marketing of the equipment;
- customers expect a certain quality level from refurbished assets. So high-quality, reliable products are essential;
- making clear to customers the extent to which an asset has been refurbished, and the refurbishment's added value;
- customer perception is important: be transparent, and establish quality and trust by issuing a warranty.

“We need to clearly differentiate the refurbished product portfolio from new equipment; we must be mindful of which markets we are releasing these products to, the price points and general marketing activities to prevent cannibalising our existing 'new equipment' market.”

Greg Sparkes

Sr. Program Manager – Europe, Stryker



Commitment within the company

There must be sufficient commitment throughout the company, from both managers and employees, to make refurbishment work. Management should have the right focus and strategic vision to drive this business, and consider at an early stage how to organize processes efficiently. Strong leadership is needed to achieve the desired results. Good, clear communication is also crucial here.

"You need full staff commitment and motivation, and refurbishment needs to be part of the strategy determined by top management."

Heinz Wortmann

Customer Services Manager Europe, Bell



Reverse logistics

Having a trade-in program creating sustainable return flows of used assets is important to a successful refurbishment business. The sourcing of assets or raw materials and validation of the trade-ins both need to be handled well. Reuse of resources should be maximized and refurbishment occur in a controlled way.

"It's most important to set up reverse logistics — for the return flows, but also for the to-be-recycled products."

Jeroen van Nistelrooij

Global Marketing Director Refurbished Systems, Philips



Profitability

Establishing the right price-point means setting a price that customers accept, while still generating a reasonable profit margin. Overlooking the costs and looking at your competitors' pricing are very important elements of your pricing strategy. Price positioning compared to your new products needs to be clear and attractive in order to appeal to the right customer segment and not compromise new equipment sales.

Predictability of supply and demand

The target is to have a predictable and significant return flow of used assets. Eventually there should be a balance between both supply and demand, and quality and costs. Maintaining a 'safety stock' of spare parts and products is also important, since this can give a competitive advantage. The demand of trade-ins and refurbished assets should be well-monitored, so you can respond to quickly changing markets and customer demand.

"Leasing is amazing, because it enables us to deliver new or refurbished systematically. It is a very big, and in particular very stable, source of return flows."

Jeroen van Nistelrooij

Global Marketing Director Refurbished Systems, Philips



Be aware

External factors may influence your refurbishment business, such as:

- Regulations for disposal of equipment (e.g. the WEEE Directive)
- Trade legislation on used equipment
- (Future) scarcity of resources or raw materials
- Circular Economy – an increased responsibility for manufacturers to establish circularity for the equipment they produce
- ISO Standards
- Industry standard levels of refurbishment

Refurbishment and Life Cycle Asset Management

A challenge for manufacturers is to find the optimal time to carry out refurbishment during the life cycle of equipment.

This depends on a number of factors related to the technical life of the equipment, rate of technological obsolescence, customer demand, and costs of maintaining, refurbishing and remanufacturing the equipment. Figure 3 shows a few examples of moments during the life cycle of an asset and, specifically, at what point in time during the life cycle refurbishment can typically be found. It is essential to highlight that this can vary significantly by asset type and practices.

As an example, for an asset such as a crane, with a significantly long life cycle, a complete refurbishment might not occur until the equipment reaches the end of the technical life (given that standard repair and maintenance is done periodically).

At this point, the equipment can be either taken apart for remanufacturing or part harvesting. In the so-called 'hard-assets' domain, remanufacturing can be a very profitable activity (even more than refurbishment); this is due to the high value of main components such as engines. Quite different considerations are to be made when dealing with equipment with a low collateral value, such as electronics, IT equipment or low-tech/portable healthcare imaging or diagnostic devices. For such equipment types, scrapping at the end (or even before) of the technical life is quite a common activity, due to the relatively high value of the raw materials and low costs of disposal. It is important to say that regulations related to disposal of these materials and components are becoming stricter in most countries.

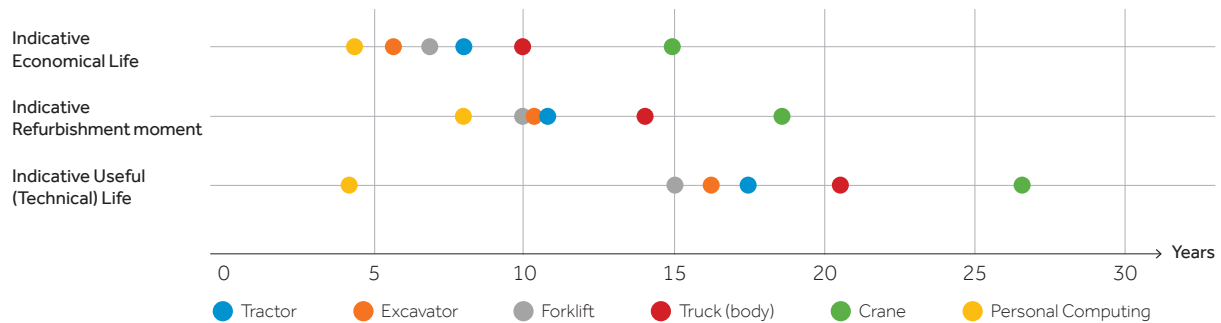


Figure 3: Indicative refurbishment moment in the lifetime of the equipment

Refurbishment as a profitable revenue stream

Profitability is another key topic for the manufacturer to assess the feasibility and long-term sustainability of the refurbishment activity. Figure 4 provides an insight into the typical costs of acquiring a used piece of equipment, running it through a refurbishment process and bringing it to a new customer.

It is evident that the spread in costs and margins vary a lot depending on the sector, equipment and manufacturers' processes and facilities.

Nonetheless, it seems clear that, if well managed, refurbishment can lead to a profitable alternative revenue stream.

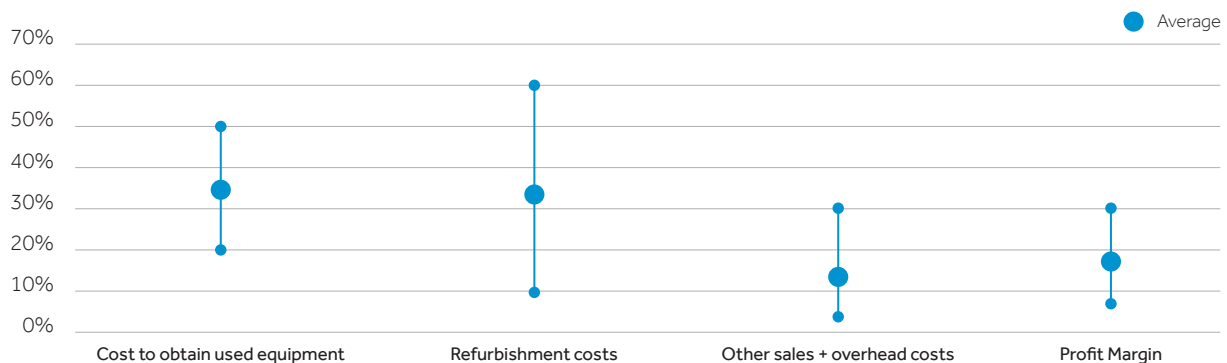


Figure 4: Refurbishment costs build-up

Leasing: an ideal way to enable the refurbishment process

Leasing can be used as an enabler of the refurbishment process, by providing usage-based financial solutions at different stages of the asset life cycle.

Leasing enables the creation of a steady and predictable flow of returned assets. Thus facilitating the reverse logistic process, and insuring predictable volumes for the refurbishment facility and sales. Manufacturers with good refurbishment processes also benefit from leasing, by keeping a grip on their assets and optimizing the asset value through multiple life cycles.

Next-life materials and products work when a company can efficiently recover and recondition its products after use, and then put the same (or refurbished) products into the market to earn a second or third income.

"In the refurbishment business it is important to have a good return flow of equipment. The best option for this is operational lease, because you remain owner of the machine and know when you'll be getting the asset back. This ensures a stable flow of returned equipment which can be used for refurbishing."

Edwin van Asselt

Manager Used Equipment Center, MotracLinde



Checklist how to get started with refurbishment



■ Assess the market and customer needs

By performing a comprehensive SWOT analysis, researching your competitors (OEMs and others) and segmenting your customers.



■ Know your product during life

By taking a part your product after the first life and determine the worn or critical parts.



■ Make a business case for your company

Assess market opportunities, product design, organizational capabilities, production processes and profitability targets.



■ Create a compelling value proposition

By determining the added value you are delivering to your customers, the product range suitable for refurbishment (or refurbishment levels), and the correct market positioning and pricing.



■ Develop organizational capabilities

Including highly-skilled staff, reverse logistic processes, product design, refurbishment capabilities and quality standards.



■ Make sure refurbishment is key strategic priority

Within the organization, from top management right through to all employee levels.



■ Regularly re-assess

Market and customer needs, competition, perception, quality standards, and process efficiency.

Extract more value from your equipment and technology with DLL

Create second and third life revenue streams for your equipment and technology while supporting the circular economy.

DLL actively supports manufacturers and their distribution partners with financial solutions for **reused, refurbished and remanufactured equipment.**

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DLL has offices in more than 30 countries throughout Europe, North America, South America, Australia and Asia. The company is part of the Rabobank Group. 8/18



Closing note

DLL is a global vendor finance company with more than EUR 30 billion in assets. Founded in 1969 and headquartered in Eindhoven in the Netherlands, we provide asset-based financial solutions to the Agriculture, Food, Healthcare, Clean Technology, Construction, Transportation, Industrial and Office Technology industries. We work closely with global equipment manufacturers and their distribution partners – from authorized distributors and independent dealers to resellers – to provide financial products & services that help them achieve sustainable, profitable growth. By combining customer focus with deep industry knowledge, we deliver sustainable solutions for the complete asset life cycle, including commercial finance, retail finance, and used equipment finance. We are a wholly-owned subsidiary of Rabobank, a Dutch bank headquartered in Utrecht.

DLL Life Cycle Asset Management

DLL recognizes the opportunity to obtain value during the full technical life cycle of assets (Life Cycle Asset Management). This is accomplished by providing tailored financial products & services such as:

- Operational lease
- Fleet management
- Stock finance
- Second Life finance
- End-of-life treatment

These include repair, maintenance, refurbishment and remanufacturing services by DLL's manufacturing partners. Enabling manufacturers, dealers, end-users and DLL themselves to extract more value out of an asset's qualities.

Contact

Authors

Paul Wind, Mariagiulia Benato, Egbert de Jong

For more information

Please contact your DLL representative or:
LCAM@dllgroup.com
www.dllgroup.com

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