

BERYLLS STUDY

STRATEGIC IMPORTANCE OF REFURBISHMENT FOR 4R CONCEPTS AND MULTI-CYCLE SALES MODELS

February, 2023

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KEY FINDINGS...

- 1 Many OEMs** are trying to increase the sustainability of their business model and the resilience of their supply chain, and have announced Refurbish, Remanufacture, Reuse, and Recycle (4R) strategies to maximize their reuse of valuable materials.
- 2 However,** their strategies are at the moment neither comprehensive nor consistent. On the one hand, they usually focus on recycling only, on the other hand they tend not to consider an important prerequisite for their strategies: Being the legal owner of the vehicle throughout and particularly at the end of its lifetime (around 8-10 years).
- 3 During the 8-10 year period,** OEMs will need to redeploy the car to different end customers for different types of contract, as part of a multi-cycle Vehicle-as-a-Service (VaaS) sales model, rather than selling the car outright when it is new.
- 4 This multi-cycle sales model** will put vehicle condition in the spotlight, as it will be essential to maintain a certain standard of quality so the car is available for as many types of business models as possible.
- 5 Efficient refurbishment operations** to maintain the quality of vehicles between different use cycles will therefore become a strategic enabler for both multi-cycle sales models and for OEMs' holistic 4R strategies.



THE IMPORTANCE OF 4R STRATEGIES in the context of business model and sustainability transformation is increasing rapidly and only few players are starting to get prepared. **Now is the time to decide whether to be a pioneer or a laggard in two of the most relevant future fields of action!**



CUSTOMER PREFERENCES ARE CHANGING: FROM CAR OWNERSHIP TO USING A VEHICLE 'AS A SERVICE'

- Customer needs and the resulting demand patterns are changing in the automotive industry. Owning a prestigious car used to be a symbol of status, but vehicle ownership is no longer the aspiration of many drivers, particularly among younger people, and is perceived as a burden rather than an advantage
- Three trends have accelerated this change in customers' preferences:
 - **Flexibility:** Long-term commitments and rigid asset ownership are out of sync with the lives and demands of today's customers
 - **Technology risk:** Constant improvements in technology lead to shorter product lifecycles and new vehicle values declining faster
 - **Fear of missing out:** The number of vehicle brands and therefore options is increasing, making customers reluctant to be tied to the same car for an extended period of time
- These forces present a fundamental challenge for the traditional automotive business, built on one-off sales, financial services, and after-sales revenue
- Vehicle-as-a-Service (VaaS) models (i.e. flexible leasing agreements, subscriptions, and rental offers), in which the customer does not own the vehicle and returns it at the end of the contract, are on the rise
- Based on an extensive customer survey, we estimate there will be a 38% increase in the market share of VaaS models by 2025. In addition, 13% of today's non-car owners are interested in "as-a-service" offerings, opening up considerable new opportunities (for more detail on the customer survey, please see box on the right)

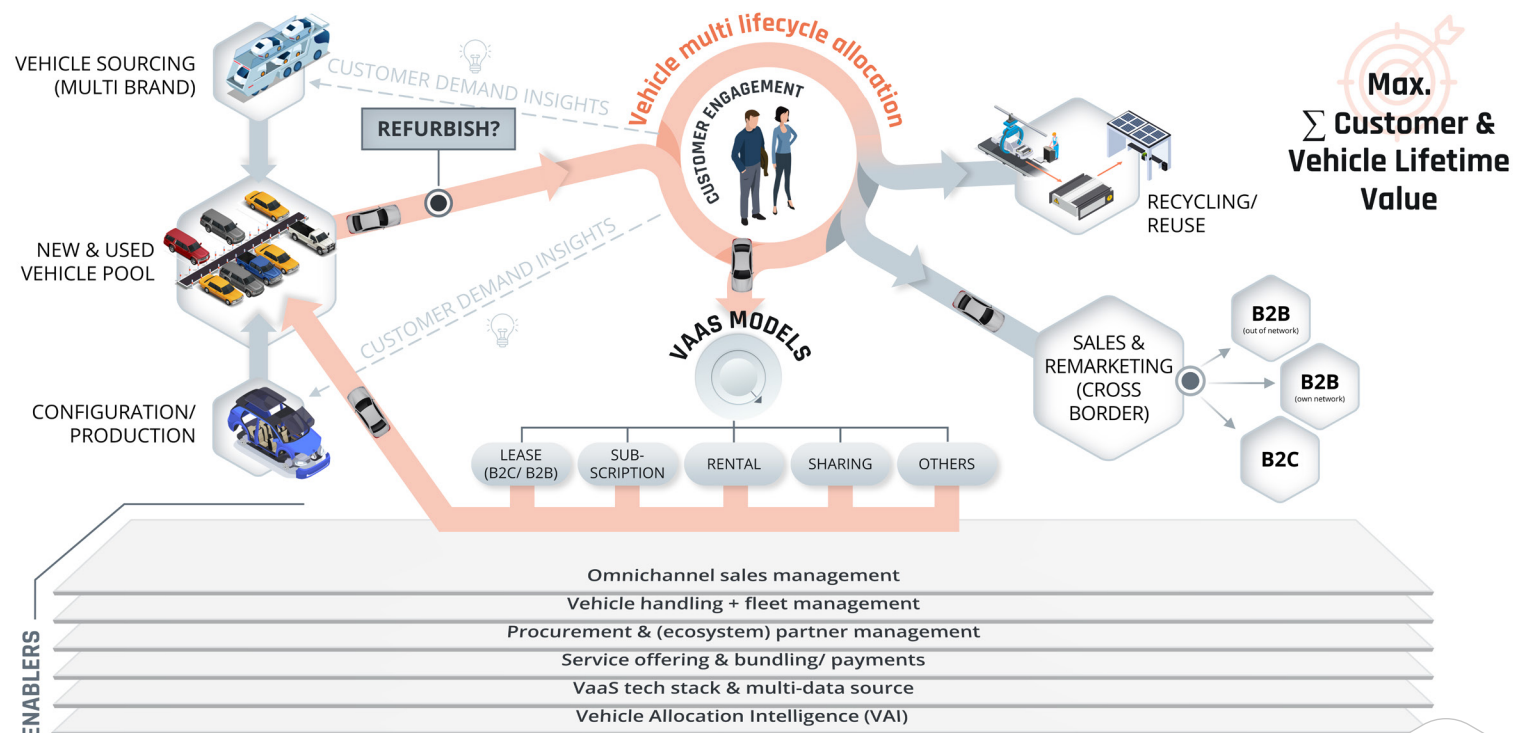
About the customer survey:

- » **2,040 retail customers** in Germany (urban and rural) surveyed in January 2022
- » Focus on **Gen X-Z** (16-56 years old) to understand views of younger drivers
- » **New car, used car and no car owners**
- » Asked about their **next mobility choice** to analyze changes in vehicle usage and ownership needs



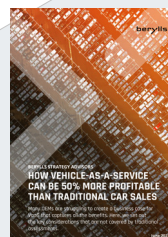
➤ **TO LEARN MORE:**
Please have a look at our previous [Vehicle-as-a-Service customer survey](#)

THE VEHICLE-AS-A-SERVICE (VAAS) BUSINESS MODEL: TARGET PICTURE



Source: Berylls Strategy Advisors

IMPLICATIONS OF VAAS ON THE OEM BUSINESS MODEL



FOR DETAILED INFORMATION on multi-cycle sales models and the VaaS target picture, please read our full [VaaS Study](#)

- » In contrast to the traditional automotive sales model, where the end customer takes legal possession of the vehicle after the contract ends, **VaaS providers remain the legal owner of the vehicle**, with cars returning to them after the current contract is over
- » The shorter contract duration of VaaS offers will put pressure on providers' profitability. **Break-even per vehicle will not be achieved within one use cycle anymore**
- » VaaS providers must therefore **hold on to the vehicle for multiple use cycles** to extend the period in which they can earn money from it. This means **finding new customers for used cars that have been returned** by the previous customer, rather than selling them
- » If done the right way, this multi-cycle sales model **is as much as 50% more profitable** than the traditional one-off sales model
- » **This is not just a theory:** some of the largest global OEM captive financing divisions are currently transforming their business model in this direction

THE INCREASING FOCUS ON SUSTAINABILITY BRINGS REFURBISH, REMANUFACTURE, REUSE, AND RECYCLE STRATEGIES TO THE FORE

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RELEVANCE OF 4R STRATEGIES

- » In addition to the two ongoing transformations happening in the automotive industry (technology transformation to electric drivetrains and greater vehicle autonomy) and sales and business model transformation (to VaaS), OEMs face increasing pressure to cut their environmental impact
- » This means reducing their carbon footprint, but also their raw material and resources consumption, and making their operations and business model more sustainable (*not focused solely on selling more and more cars*)
- » In response, OEMs are starting to put in place Refurbish, Remanufacture, Reuse, and Recycle (R4 or the “4Rs”) strategies
- » Taking a closer look at the strategies announced to date, it’s clear that OEMs are focusing mostly on end-of-life applications, such as recycling and reuse of vehicles and battery modules. Recycling and reuse are the “2Rs” that appear to be the most profitable at present
- » Only a small number of OEMs are also looking at measures to refurbish vehicles or remanufacture components

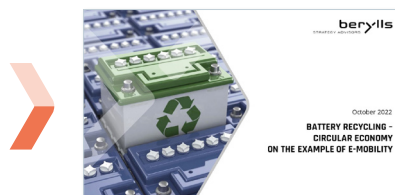


PREREQUISITES OF 4R STRATEGIES

- » For 4Rs strategies to succeed, there is an essential prerequisite: the OEM must be the legal owner of the vehicle and have access to it when the time comes to reuse or recycle
- » To achieve this, OEMs need to follow a VaaS business model which means keeping the vehicle in their fleet and remaining the legal owner. By doing so, they have the opportunity to leverage the value that, for example, EV battery modules represent and maximize their share of vehicle lifetime value
- » To make this model profitable, the car must be redeployed to different customers for different use cycles while it is owned by the OEM, as described in the previous chapter



FOR MORE
INFORMATION:
Please have a
look at our
“Battery Re-X” study



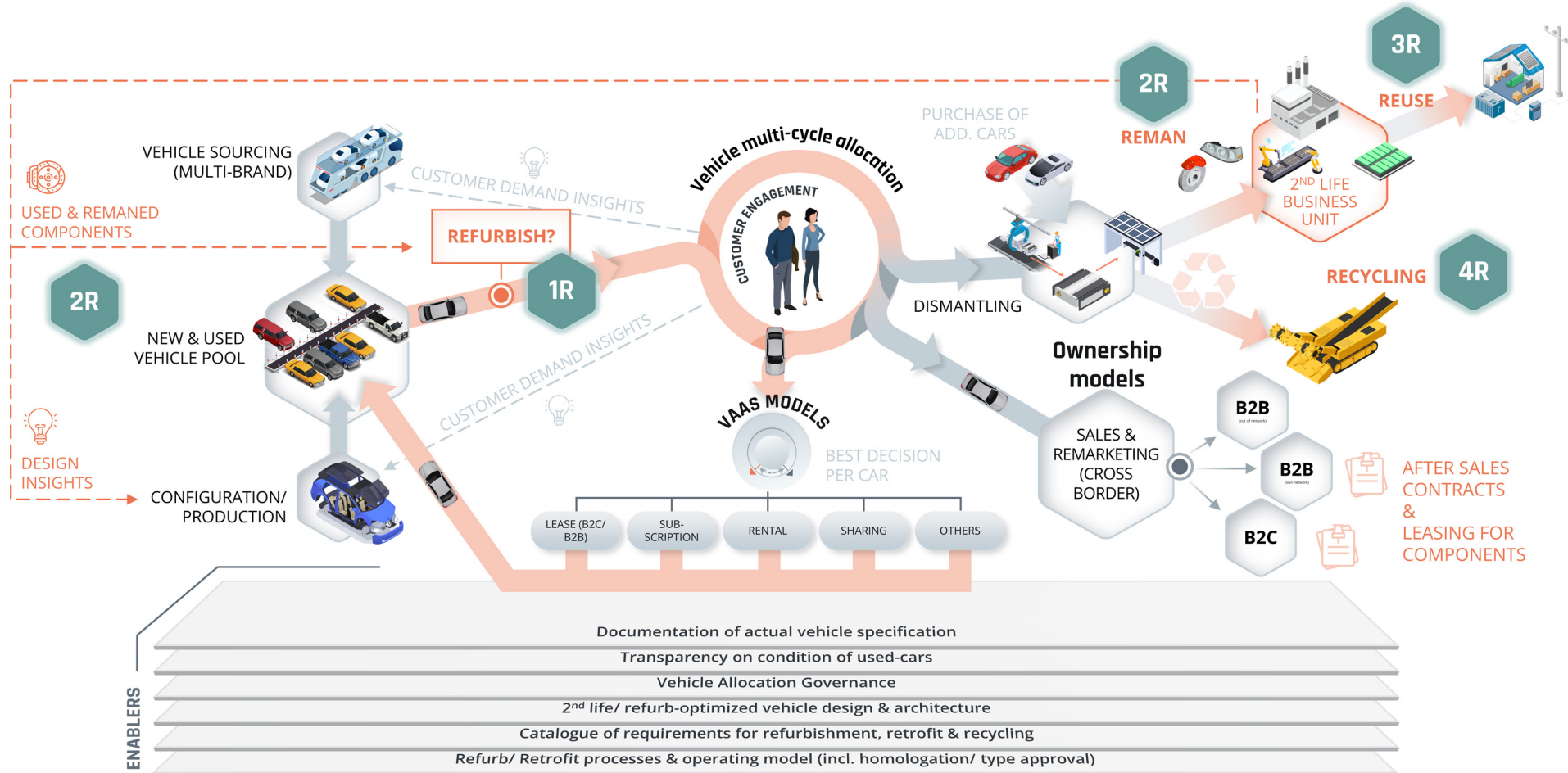
OVERVIEW OF THE FOUR PILLARS OF AN 4R CONCEPT

	1R	2R	3R	4R
Step	REFURBISH	REMANUFACTURE	REUSE	RECYCLE
Level	Vehicles	Modules		Parts
Activity	Overhaul used vehicles to bring them to the required quality level for their next use cycle	Repair or recondition used or broken modules and components so they perform as well as new ones	Put an used, still-working module into another vehicle or use for second-life application	Dismantle cars and parts down to their raw materials and reintroduce into production
Examples (Battery EV)	Repair and polish up an used vehicle for a new customer (e.g., fix dents and scratches or retrofit new components like head-up displays)	Replace defective elements of an on-board charger with a remanufactured one to make it fully functional	Reuse a battery in a new vehicle or as a form of stationary energy storage	Extract cobalt, lithium, rare earths and other valuable materials from the battery pack

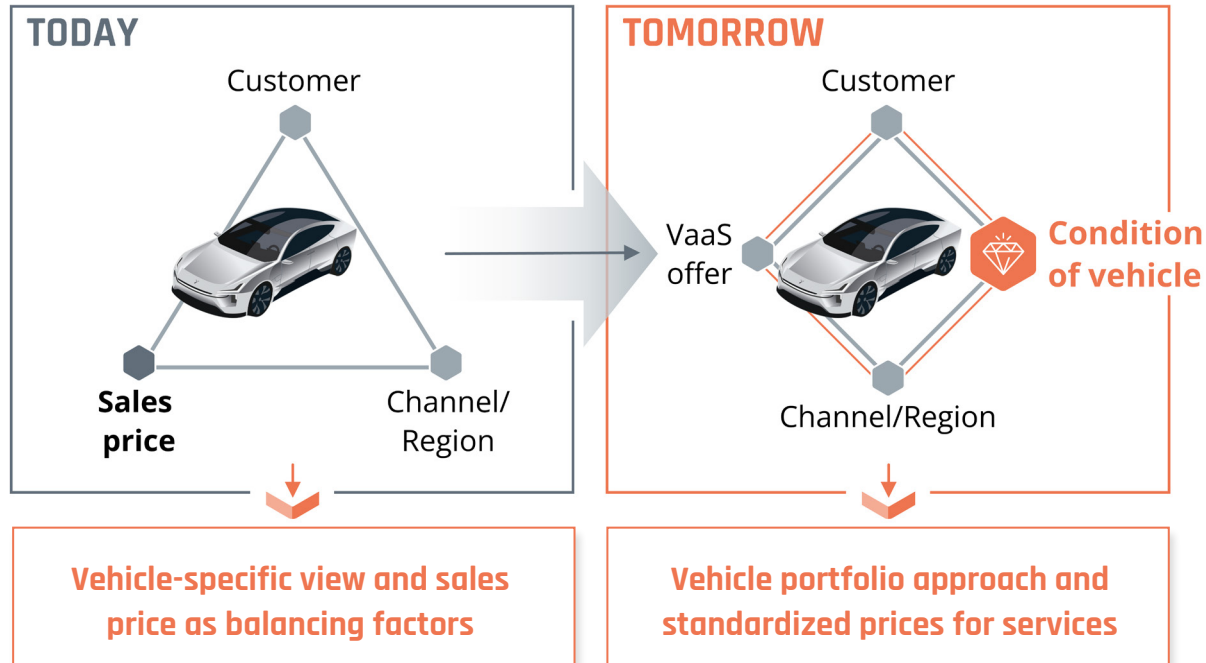
Source: Berylls Strategy Advisors

BERYLLS' VISION FOR REFURBISH, REMANUFACTURE, REUSE, AND RECYCLE

We believe that taking a lifetime view on vehicles and components has significant strategic and commercial benefits. Refurbishment is a key enabler for the multi-use sales cycle that OEMs must pursue to keep ownership of the vehicle throughout its lifetime



VEHICLE CONDITION AS A CRITICAL SUCCESS FACTOR



IMPROVEMENT LEVERS

- » Leverage different market requirements via cross-border sales
- » Increase target customer reach via more sales channels

IMPROVEMENT LEVERS

- » Increase VaaS product portfolio to have more redeployment options
- » Refurbish vehicles between use cycles to maintain and improve vehicle quality & features




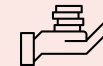

VEHICLE CONDITION BECOMES A CRITICAL SUCCESS FACTOR IN FUTURE

- » In today's used car business, the condition of the vehicle is not a major issue, as discounts can be applied to the sticker price to make up for value-reducing factors such as dents or scratches
- » In addition, most providers are increasing their market and channel coverage to reach as many customers as possible, improving the likelihood of being able to sell the car whatever its condition
- » However, within a multi-cycle sales model, the key metric is to maximize vehicle utilization
- » Therefore, it is essential to have vehicles in a suitable condition to deploy to the next use cycle as soon as possible
- » Each type of VaaS business model (including subscriptions and used car leasing) will have specific requirements on vehicle quality/ condition when a new contract is signed
- » As a result, **the ability to adapt a vehicle's condition to the specific requirements** (to be able to always choose the VLV-optimizing next use cycle) **becomes a strategic enabler**
- » In comparison with the one-off sales model, there is also less vehicle-specific pricing. Most VaaS offers will have standardized prices for a particular vehicle category. As a result, customers will expect all vehicles included in the offer to be in comparable condition

DESCRIPTION

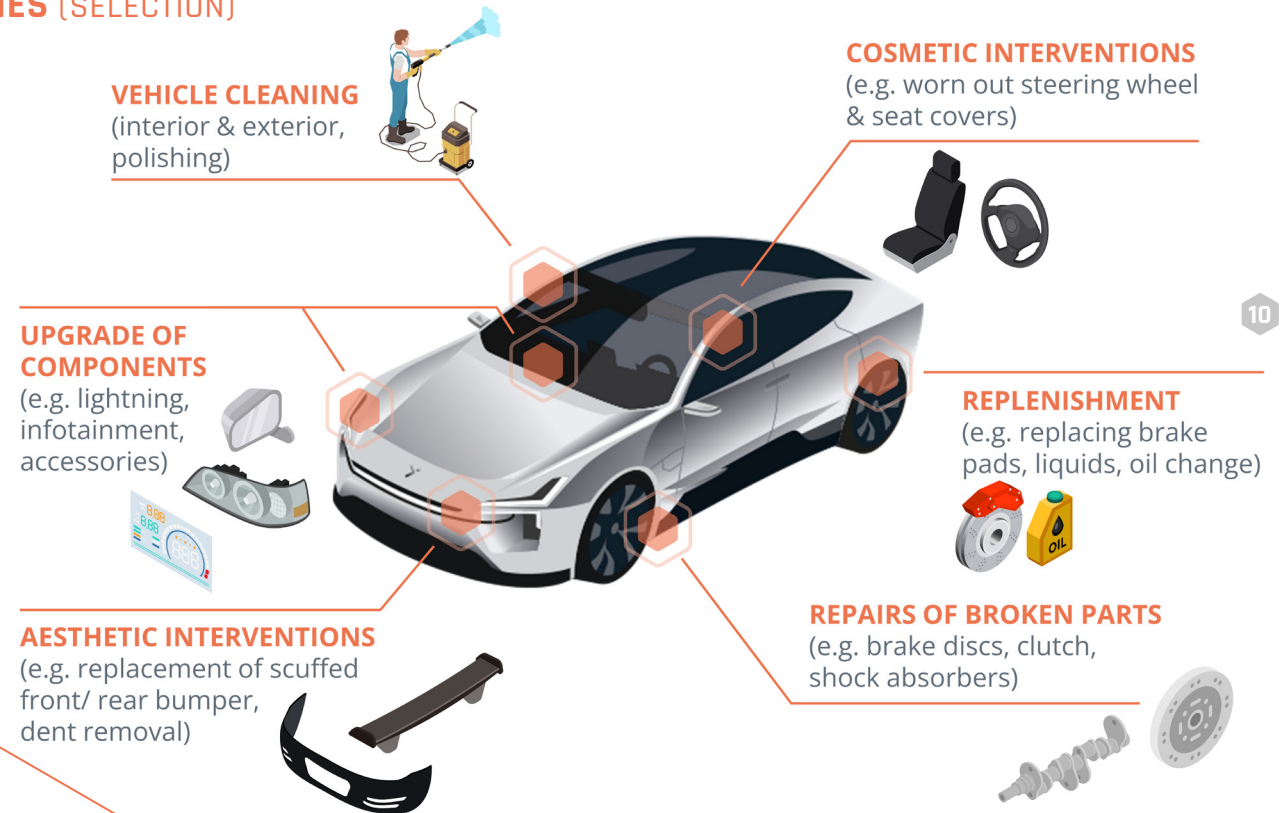
- » With the market shifting from one-off to multi-cycle sales, refurbishment will become a key enabler for both VaaS offers and 4R strategies
- » We expect that vehicles will need to be refurbished between at least some of their use cycles, depending on the level of wear and tear, to guarantee consistent vehicle condition and quality for customers
- » Refurbishment will include repairing broken parts, reconditioning worn components and retrofitting new ones, to upgrade vehicles throughout their use cycles (*please see next page for more details*)

SUCCESS FACTORS

-  Geographically balanced shop network to optimize both coverage and economies of scale
-  Optimized logistic for efficient vehicle in- and outflow
-  Multibrand recondition, repair and retrofit capabilities
-  Cost efficient sourcing of required spare parts
-  Refurbishment-optimized vehicle design

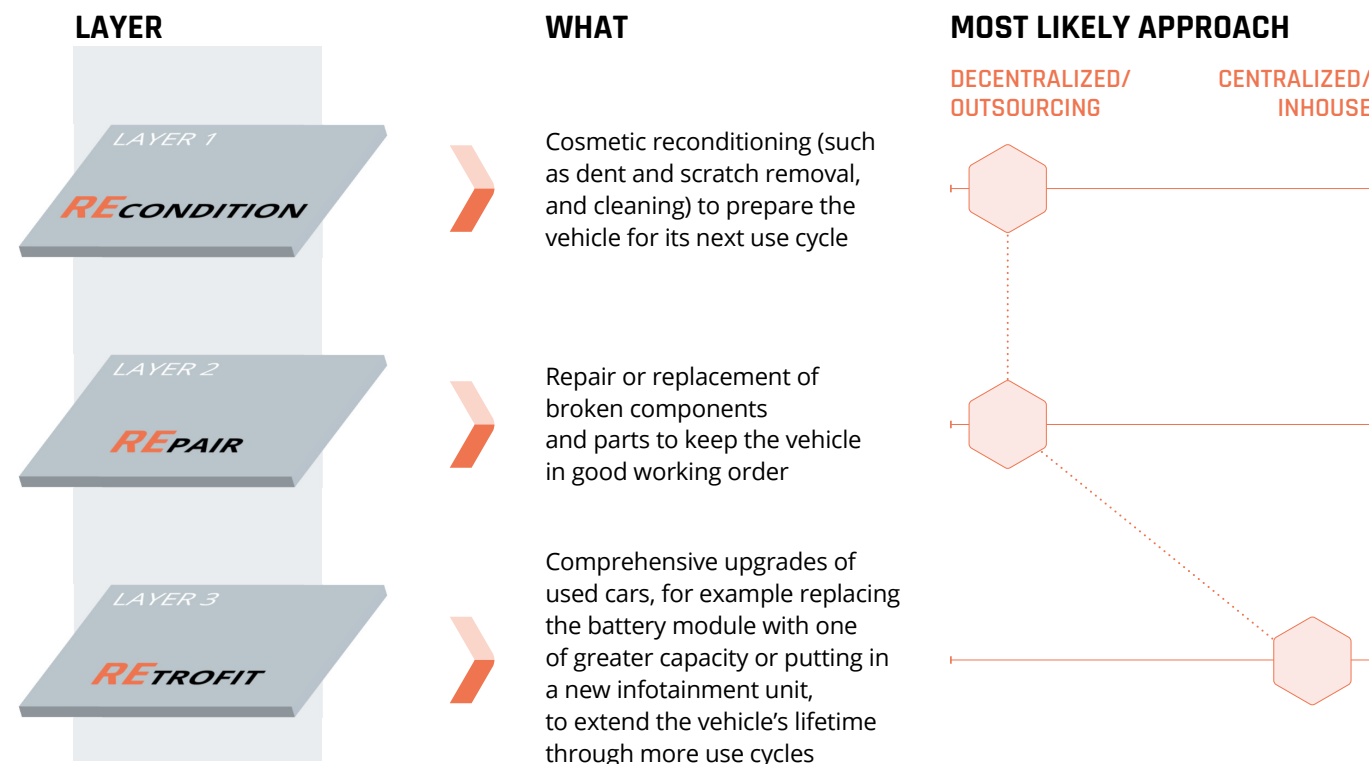
REFURBISHMENT IS A STRATEGIC ENABLER FOR BOTH THE MULTI-CYCLE SALES MODELS OF VAAAS AND 4R STRATEGIES

COMMON REFURBISHMENT ACTIVITIES (SELECTION)



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SCOPE OF REFURBISHMENT ACTIVITIES



Source: Berylls Strategy Advisors

REFURBISHMENT – A CLOSER LOOK AT THE VALUE-CREATION LAYERS

- » Several captives and leasing companies are already partially refurbishing their vehicles
- » However, the focus for them is on maximizing the sales price for lease returns on the used car market, where it makes sense economically
- » In the future, the scope of work should be increased significantly, as cars within a VaaS fleet (kept for more use cycles rather than solely for the new car cycle, as they are today), will be refurbished on a recurring basis (*please see quantification on page 12*)
- » Current capacity is not sufficient for this and VaaS providers **need to think now about how they can refurbish cost effectively in the future.** For example, it tends to be more feasible to outsource reconditioning, but to do retrofitting in-house

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Indicative

**REQUIRED
REFURBISHMENT
ACTIVITIES**

OF REFURBED
CARS PER YEAR

200,000

1.82 million

AVERAGE TOTAL
PORTFOLIO SIZE

3 million vehicles



9.1 million vehicles

BUSINESS MODEL

- » Focus: 0-3 years (new car lifecycle)
- » Offering: Operating lease
(1 million new contracts a year)

- » Focus: 0-9 years (three lifecycles)
- » Offering:
 - Operating lease (1 million new contracts a year)
 - Subscriptions (200,000 new contracts a year)

TRADITIONAL SALES MODEL

Predictable and uniform requirements due to young used cars only

MULTI-CYCLE SALES MODEL

Wide range of different requirements due to varying vehicle age (from one year to seven/ eight-year-old cars)

ASSUMPTIONS

- » Average contract duration: 36 months
- » 20% of all returned vehicles must be refurbed

- » Average contract duration:
 - Operating lease: 24 and 36 months (50:50 share)
 - Subscription: 12 months
- » 60% of all returned vehicles must be refurbed

Source: Berylls Strategy Advisors

9 x
more Refurb
activities

12



**Refurb
requirements -
CASE STUDY**

Exemplary
extrapolation based
on a proxy EU
VaaS provider

**COMPARISON OF REFURBISHMENT ACTIVITIES TODAY & IN FUTURE -
WE EXPECT A SIGNIFICANT INCREASE IN REQUIRED CAPACITY
AS MORE VAAS PROVIDERS FOLLOW MULTI-CYCLE SALES MODELS**

FIRST MOVERS IN REFURBISHMENT: THREE ARCHETYPES

More and more automotive companies are focusing on refurbishment activities - although for different strategic rationales

OEM GROUPS

STRATEGIC RATIONAL

- » **Strategic enabler**/ foundation, required to bring **4R strategies** and planned future **Vehicle-as-a-Service offers** to life, and to **capture the corresponding profit potential**
- » Opportunity to **use selected old plants for refurbishment tasks**
- » **Risk reduction** for availability of parts and future environmental regulation

REMARKETING & USED CAR SELLER

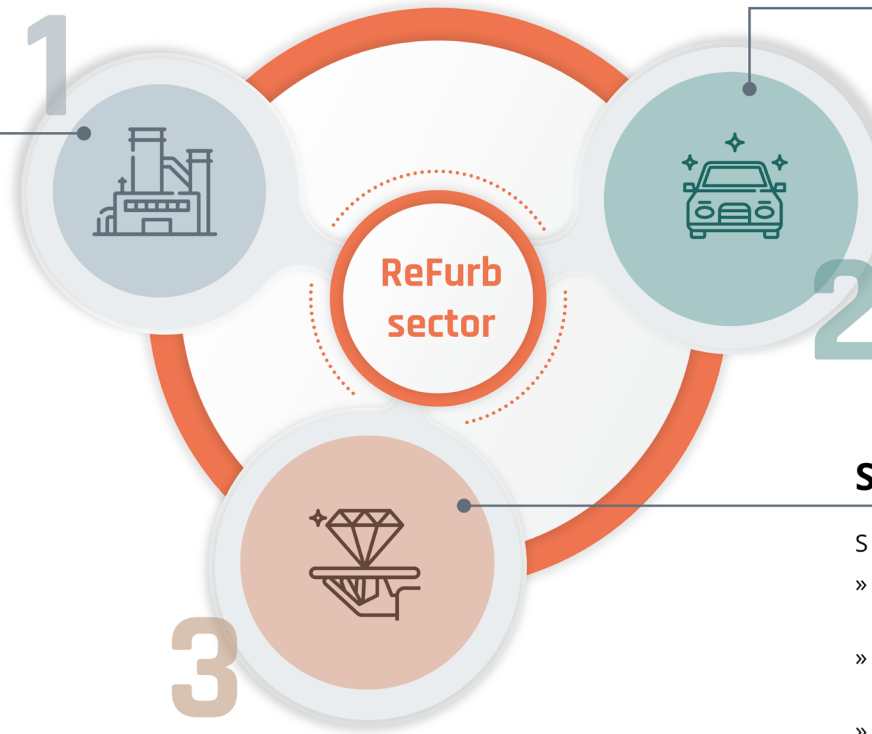
STRATEGIC RATIONAL

- » **Greater control** along the used car value chain
- » **Unlock additional sources of used cars** of lower quality levels
- » **Complement own service offering** with refurbishing services, to **increase revenues from used car sales and handling fees**
- » Evolve into an integrated **end-to-end remarketing service provider** for OEMs/ Captives

SPECIALIST SERVICE PROVIDERS

STRATEGIC RATIONAL

- » Expand quickly to **secure a strong foothold and market share in the growing market**
- » **Evolve to become white-label service providers/ strategic partners** for OEMs and Captives
- » **Drive innovative solutions and process improvements** to reduce cycle times and benefit from economies of scale



Source: Berylls Strategy Advisors



WE EXPECT AN INCREASING NUMBER of co-operation and partnership agreements in the field of refurbishment services in the near future, as well as a rising number of acquisitions and strategic investments

GROUPE RENAULT

- » In November 2022, a new entity called The Future Is Neutral was launched, which combines all the closed-loop circular economy activities of the group and has a target for €2.3 billion in revenue by 2030
- » In 2020, Renault was the first OEM to convert a plant (Flins, France) to a hub for multi-brand 4Rs activities, called ReFactory; a second plant (Seville, Spain) will be opened by 2024. Total refurbishment capacity is expected to reach 120,000 cars a year by 2030

STELLANTIS

- » An 4R-based “from cradle-to-cradle” strategy, targeting €2 billion in revenue by 2030, was presented in October 2022
- » First plant (Mirafiori, Italy) will be converted to a hub for 4R activities during 2023 – further hubs, for example in Brazil, are planned to ensure global operations by 2030
- » Majority investment in Stimcar to expand its recondition activities to other relevant EU markets – the goal is to refurbish up to 100,000 vehicles per year



TOYOTA

- » The mantra is *reduce, reuse, recycle, and recover*, with a focus on improving vehicle design to minimize carbon emissions and use of resources
- » A pilot is planned in the UK, where the Burnaston, Derbyshire plant will be used to refurbish vehicles returned from Toyota's KINTO mobility services division, so Toyota can keep them up to three use cycles
- » KINTO FACTORY, a service offering retrofitting and upgrades for older Toyota cars, is available in Japan

OTHER OEMS

- » Other OEMs have announced 4R strategies, including Volvo Car Group's Circular Transformation and Audi's ReLife
- » However, their current focus is on end-of-life reuse or recycle applications only and does not include vehicle refurbishment activities

CASE STUDIES | OEMS

Only a limited number of OEMs have so far announced refurbishment initiatives on an industrial scale – most of the time, plans are embedded into wider sustainability strategies

DEKRA

- » German technical inspection company, founded in 1925, with more than 230 entities and active in over 60 countries
- » DEKRA has become an end-to-end integrated system provider of B2B remarketing and retail services for cars and trucks of all brands, and performs these services in Europe for 30-plus customers, including OEMs and leasing companies
- » Annual refurbishment capacity of around 120,000 vehicles in Western Europe, with a focus on France, Germany, and Spain

BCA - PART OF CONSTELLATION AUTOMOTIVE GROUP

- » UK-based BCA is the largest European B2B used car seller (1.5 million cars a year), with more than 50 sites in 10 European countries
- » End-to-end integrated system provider of remarketing and retail services for cars and trucks of all brands
- » BCA has signed strategic partnerships with several OEMs to build and run refurbishment centers for them, for example in the UK with VW Group (40,000 cars a year) and BMW (55,000 cars a year), but also in France with Emil Frey (*four sites by 2024*)

Major remarketing system providers and used car ecommerce platforms are also building up their refurbishment capacities - in some cases as part of strategic partnerships with OEM or dealer groups

ARAMIS GROUP

- » French used car B2C ecommerce platform founded in 2001; in 2016, Stellantis acquired 70% in order to establish its own multi-brand online D2C channel
- » After several acquisitions, Aramis today is active in six countries using six brands, including Clicars and Cardoen
- » In 2014, Aramis established its own refurbishment sites. By the end of 2022, it operated five sites with an estimated capacity of around 120,000 cars a year. Around 85% of all used cars sold by Aramis Group were refurbished in 2022

AUTO1 GROUP

- » Since September 2021, Germany-based Auto1 Group (a B2B and B2C used car ecommerce platform founded in 2012) has been investing in its own refurbishment centers and now does 90% of the work in-house
- » By the end of 2022, the company had six centers in five countries, with a capacity of around 143,000 vehicles a year and a targeted capacity of more than 500,000 a year from 2024
- » Full process control and innovative solutions led to 35% lower costs per in-house vehicle refurbishment

CASE STUDY | REMARKETING AND USED CAR SELLERS



STIMCAR

- » Founded in 2018, the French company specializes in B2B used car reconditioning/ refurbishment for all brands
- » Currently seven refurbishment centers in Western France; five additional ones are planned in the country
- » In early 2022, Stellantis acquired a majority stake in Stimcar in order to scale its innovative and fully digitalized operations to Stellantis' other main markets in Europe

MOSOLF

- » Founded in 1955, Mosolf is a German B2B specialist in logistics services for cars and trucks of all brands
- » Wide range of fleet and re-leasing services including refurbishment and reconditioning of around 600,000 vehicles a year
- » In 2014, a dedicated entity for retail services was set up. It takes a hybrid approach, with 45 Mosolf sites and service teams at dealerships. It carries out 100,000 vehicle reconditions and 180,000 cosmetic repairs per year

IRS GROUP

- » Multinational network of repair facilities, headquartered in Rellingen, Germany, with 10 entities/ brands operating more than 170 sites in five European countries
- » Business focus is on B2B reconditioning, and accidental and hail damage repair for cars and trucks of all brands
- » Since 2014, the company has followed a strong inorganic growth strategy with around 60 acquisitions, including Dent Wizard, Douteil, halo, Cryns by Damage, and pierre.dk

LEVERTOUCHE

- » Founded in 1994, the company is an Italian specialist in B2B weather and environmental damage repair, and vehicle refurbishment for cars of all brands
- » Lever Touch coordinates a network of affiliate repair shops (around 2,000 in Europe and 1,400 globally) and operates four of its own repair and refurbishment centers in Italy and Spain
- » Increasingly, its focus is on refurbishment and repairs to utilize its available capacity

CASE STUDY | SPECIALIST REFURBISHMENT SERVICE PROVIDERS



RECOMMENDATIONS

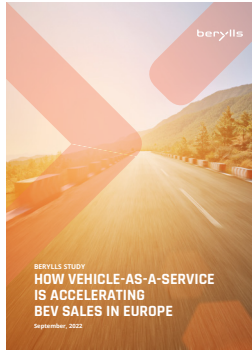
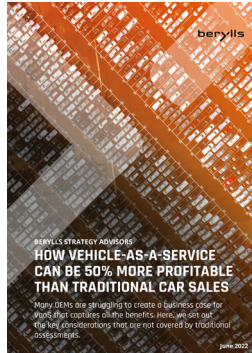
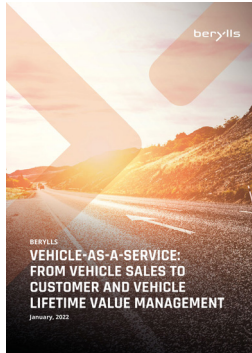
If you would like to discuss refurbishment further, don't hesitate to contact us

- 1 **Make a strategic assessment of planned VaaS business models/ scope of the multi-cycle sales model** to forecast the required vehicle portfolio
- 2 **Define a requirements catalog for the necessary vehicle condition** for each VaaS business model
- 3 **Calculate a volume forecast for future refurbishment** activities per market and region between the different vehicle usage cycles
- 4 **Develop an operating model for refurbishment activities** - focus on site selection based on logistics and vehicle flows, and establish the right make/ buy/ partner strategy
- 5 **Identify the right third-party service providers and acquisition targets** to bring your refurbishment strategy to life and reduce time to market

FIVE RECOMMENDED ACTIONS FOR OEM GROUPS AND VAAS PROVIDERS

5

RECENT PUBLICATIONS



If you want to learn more about Vehicle-as-a-Service, feel free to visit our VaaS website, read on in our cutting-edge publications or just contact us directly to discuss the impact of VaaS on your business!

BERYLLS INSIGHTS: VEHICLE-AS-A-SERVICE

THE BERYLLS GROUP'S SERVICES ARE fully dedicated to the automotive industry. Our experts in Germany, China, Great Britain, South Korea, North America and Switzerland understand the industry's key challenges and are developing ways to achieve sustainable success in the automobility eco system. We use advanced digital strategies and other innovative approaches. Our professionals are networking across five specialised units to offer our clients end-to-end support, from strategy development to the implementation. We call this network our Berylls Quintet:

Berylls Strategy Advisors – The expertise of our top management consultants extends across the entire automobility value chain – from long-term strategic planning to operational performance improvements. Based on Berylls' automobility thought leadership, our consulting teams stand out in view of their broad experience, their profound industry knowledge, their innovative problem-solving competence and their entrepreneurial thinking.

Berylls Digital Ventures – Our clients' strategic concepts require the development and operation of digital products or the implementation of new business models. The Berylls Digital Ventures team works with our clients to take up this challenge – end-to-end. At the same time, we also invest in promising start-ups and bring our own digital solutions to market, providing these ready-to-use for our clients.

Berylls Mad Media – The radical digitalisation of the customer interface undermines the boundaries in the automotive sales model. Our Berylls Mad Media experts develop and operate tailored solutions, including data-driven marketing, integrated service designs, and including the agile realisation of integrated process and IT architectures. We strengthen customer loyalty, market exploitation, and profitability – taking vehicles and services to market digitally.

Berylls Equity Partners – is a private investment company. Supported by strong anchor investors and pursuing an entrepreneurial approach, we acquire, operationally improve operationally, and furnish with a long-term strategic direction companies with value potential in the mobility industry.

Berylls Green Mobility – We believe that sustainability will deliver competitive advantages in the real world of the global automobility business. Whether in an advisory capacity to external clients and other Berylls entities or through our electric vehicle charging service Wall-E – the first free-to-the-user e-mobility infrastructure initiative which helps convert drivers' interest in e-mobility into a roadgoing reality – Berylls Green Mobility drives the change toward making automotive sustainable.

The automotive industry is currently facing fundamental challenges. We have made it our mission to support industry players in accomplishing an effective and future-proof change process. The unique value we bring to the table is based on digitisation, technological innovation, market insights and renowned partnerships. The Berylls Quintet is your high-performance engine to succeed on this exciting road.

The future will be, but different.

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