



SKF®

RECONDOIL

Clean Technology Options for oil Circularity



Circular
Economy
Symposium 2022



SKF Care – Our Sustainability Framework




SKF Care is our sustainability framework covering the business, environment, employee and community dimensions.

Intelligent and clean growth

Intelligent means providing connected and tailored offerings for our customers, as well as using technology to make our operations more efficient

Clean reflects our ability to enable a more sustainable industry, whilst running our own business in a transparent and responsible manner

The background of the entire page is a close-up photograph of a person's hands using a magnifying glass to inspect a bearing. The person's face is partially visible in the background, looking intently at the work. The magnifying glass is held over the bearing, which is a dark, circular component with a complex internal structure. The lighting is soft and focused on the hands and the bearing.

The world is changing.
And so are we.

OUR GOAL

By 2025, our own operations will be net zero

By 2030, our full supply chain, from raw materials to the delivered products, will be net zero.

Read more
at [skf.com/
decarbonizing](https://skf.com/decarbonizing)



DECARBONIZING

IN PROGRESS

Multi-stakeholder initiatives in which SKF participates



The background of the entire advertisement is an aerial photograph of a dense, lush green forest. The trees are packed closely together, creating a vibrant, textured canopy of various shades of green.

WE OIL

Join the circular movement

RecondOil®

Oil as a consumable



- SKF Uses – honing oil, grinding oil, gear oils, Hydraulic oil & Quenching oils – 12000 Ltr/month
- Oil is used, discarded and replaced - Costly and unsustainable approach
- Used oil - Hazardous waste and contains harmful metals.
- One litre of used oil can contaminate one million litres of freshwater.
- 40 kg CO² emission/1 ton oil consumed* (LCA)
- Without proper disposal procedures in place, 50% of all lubricants end up in the environment.
- India witnesses the generation of about **1.3 million tonnes** of used oil annually, **less than 15% is rerefined.** (F&S Report -2019)

SKF RecondOil

SKF RecondOil offers a sustainable lubrication solution that saves costs related to purchasing and disposing of oil.

Industrial oil lubrication no longer has to be viewed as an **expensive and environmentally harmful consumable**, but rather as an **enabler of a sustainable, circular process**.

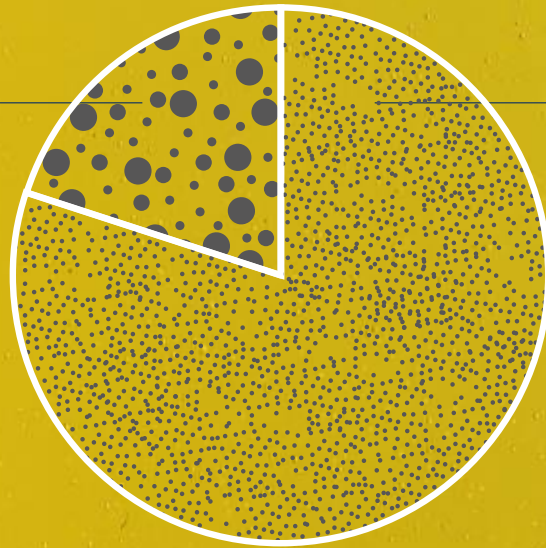


ZERO

OIL CHANGES

Conventional filters only remove the 20%...

20% micro
Particles > 1 μm



80% nano
Particles < 1 μm
Not captured in conventional filters...

Total contaminant surface area

Double Separation Technology (DST)

– a combination of chemical and mechanical separation



Chemical separation (Booster)

The oil is mixed with a booster. The booster attracts all kinds and all sizes of contaminants to larger lumps – like a magnet.



Mechanical separation

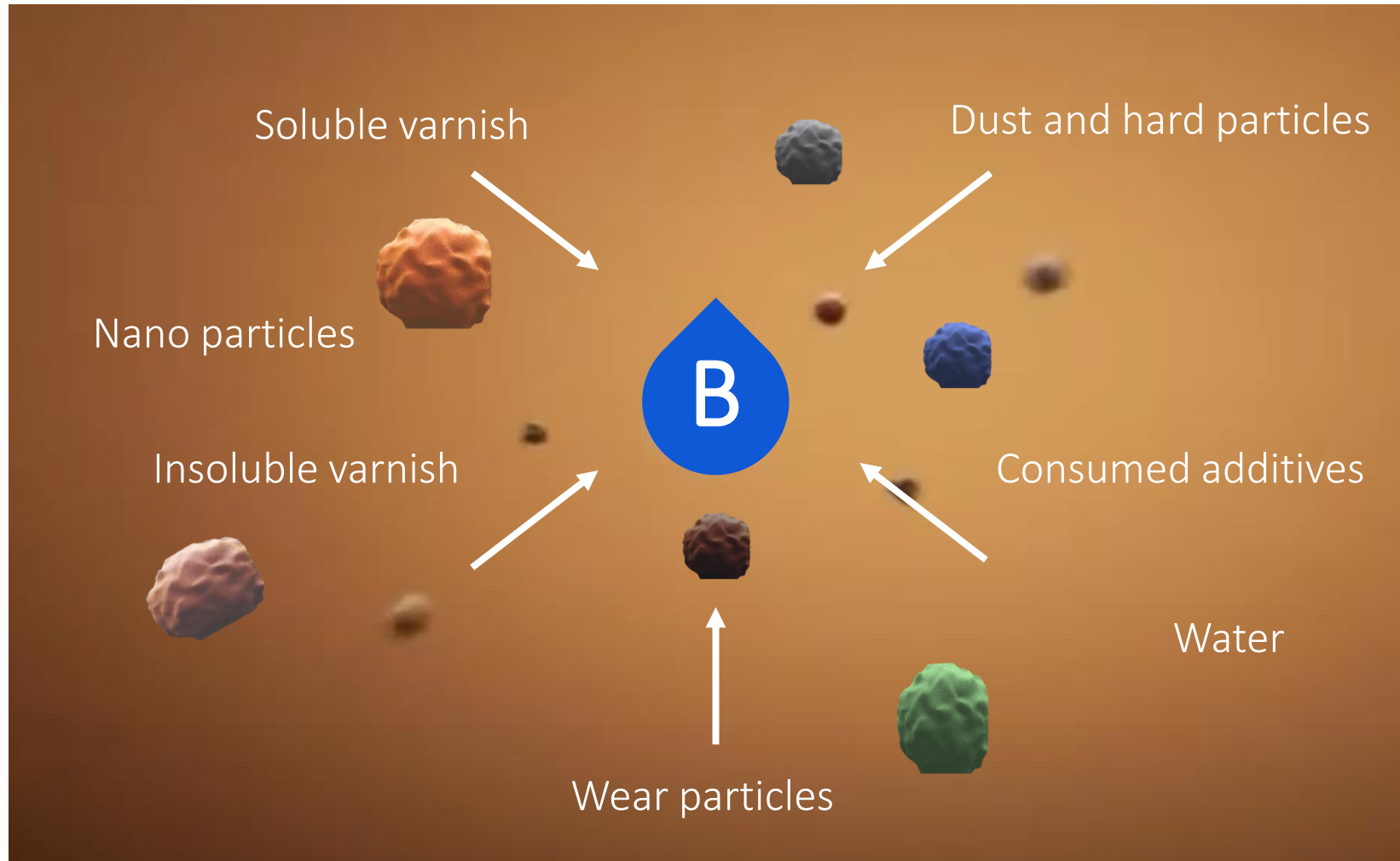
The lumps are separated by sedimentation and filtering.



Ultra-clean oil

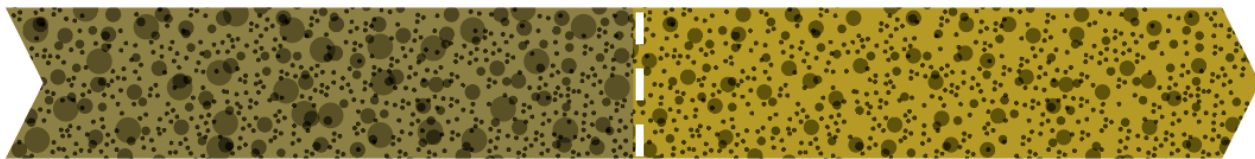
The oil is clean down to nano-level

The booster attracts all kinds of particles, of all sizes

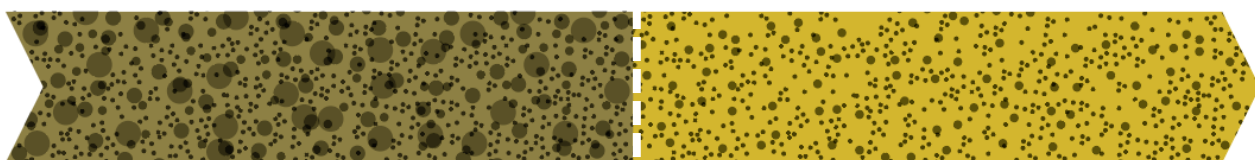


Cleaning comparison

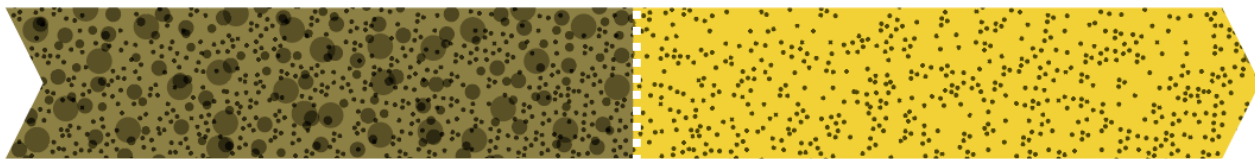
High-speed separators:
For particles > 5 μm



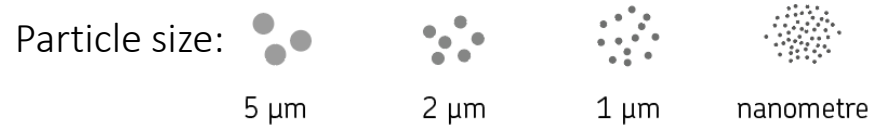
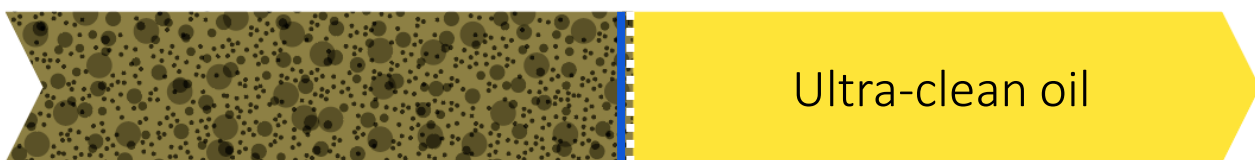
Coated filters:
For particles > 2 μm



Electrostatic filters:
For particles > 1 μm



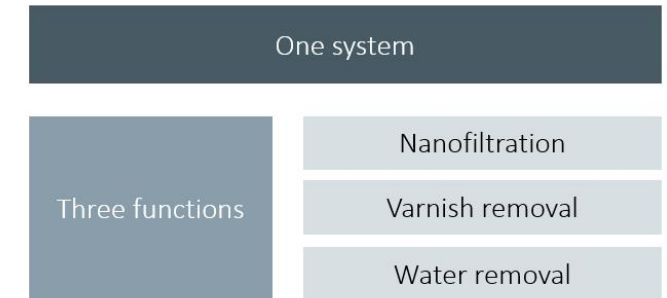
Double Separation Technology:
All particles



SKF RecondOil Systems



RecondOil Box



AFTER 3 YEARS IN OPERATION

OIL CHANGES AVOIDED

40

SCRAP RATE REDUCTION

88%

PRODUCTIVITY/PERFORMANCE GAINS

+25%

ENVIRONMENTAL
PROFILE

LEGAL
ROBUSTNESS

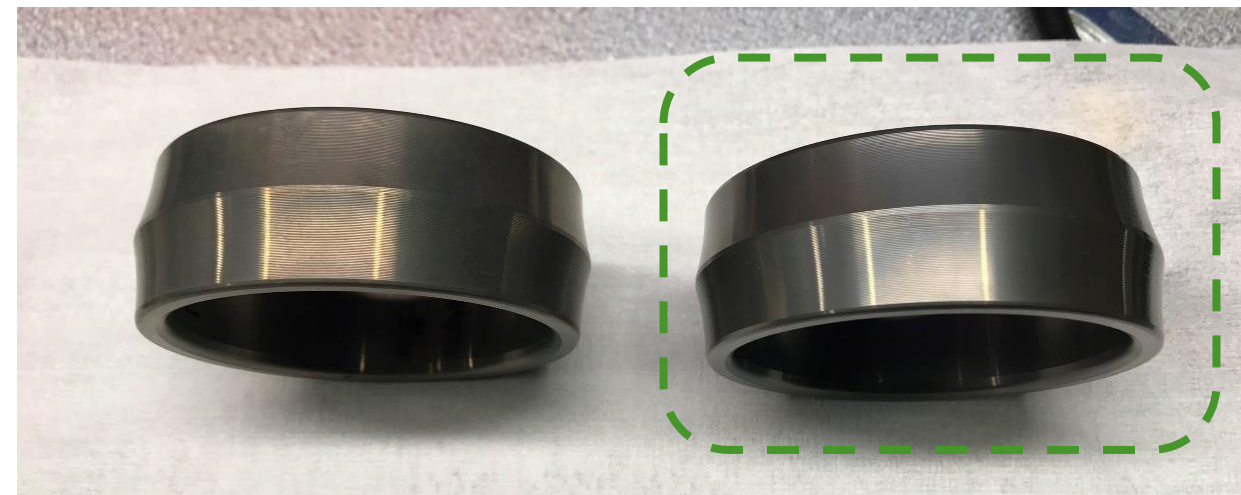
MAXIMIZED UPTIME

Test results show great performance effects

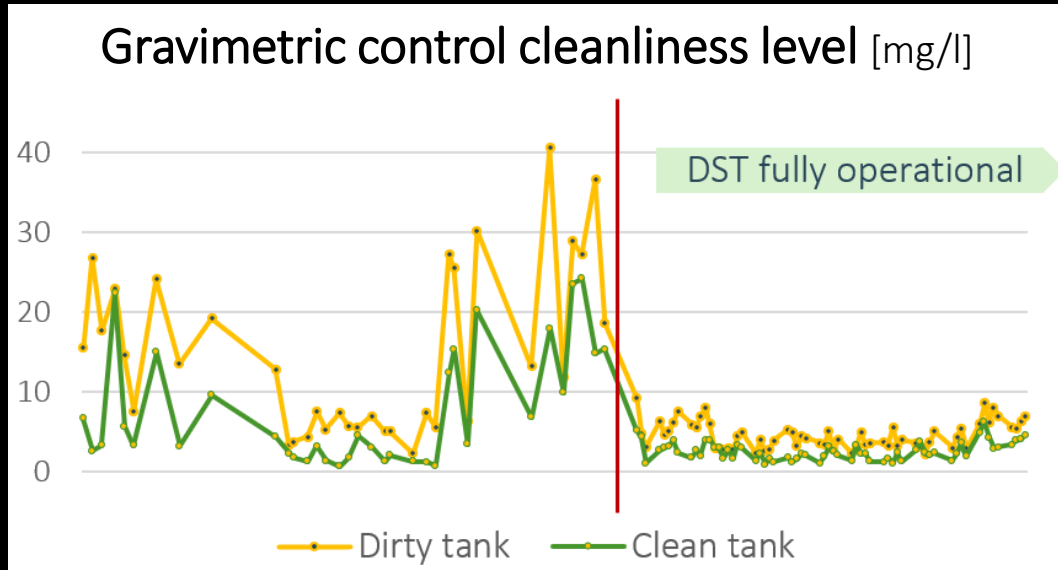
	Used oil	DST Cleaned	Reduction
Particle Counter (ISO 4406:99)	24/22/18 (130488/ml)	16/14/9 (482/ml)	99,6 %
Image Analysis (ISO 4406:87)	20/18/17 (7551/ml)	13/10/8 (52/ml)	99,3 %
Water content (ppm)	2561	120	95,3 %
Rest Booster (ppm)	--	< DL	



- Fully recovered cooling curves
- Homogenous surface color
- Substantially improved visual appearance
- No difference in hardness and micro-structure



Test results



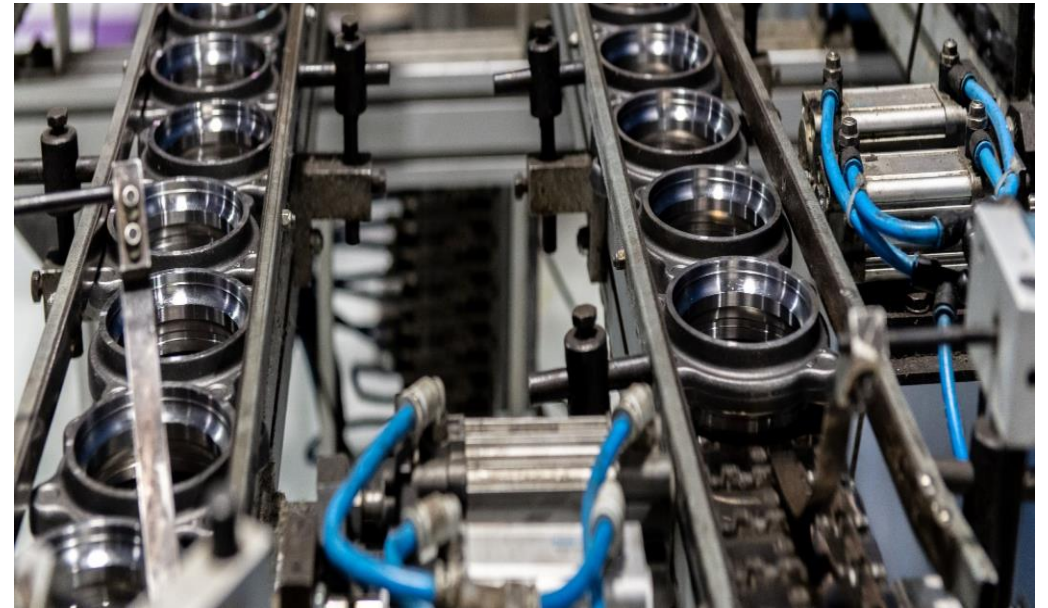
Average Ra*
Down
20%
→ impacting bearing life, friction etc.

*Ra = Surface Roughness

10%
Reduction of
N&V*

*N&V = Noise & Vibration

38%
Roundness
increase



Less scrap

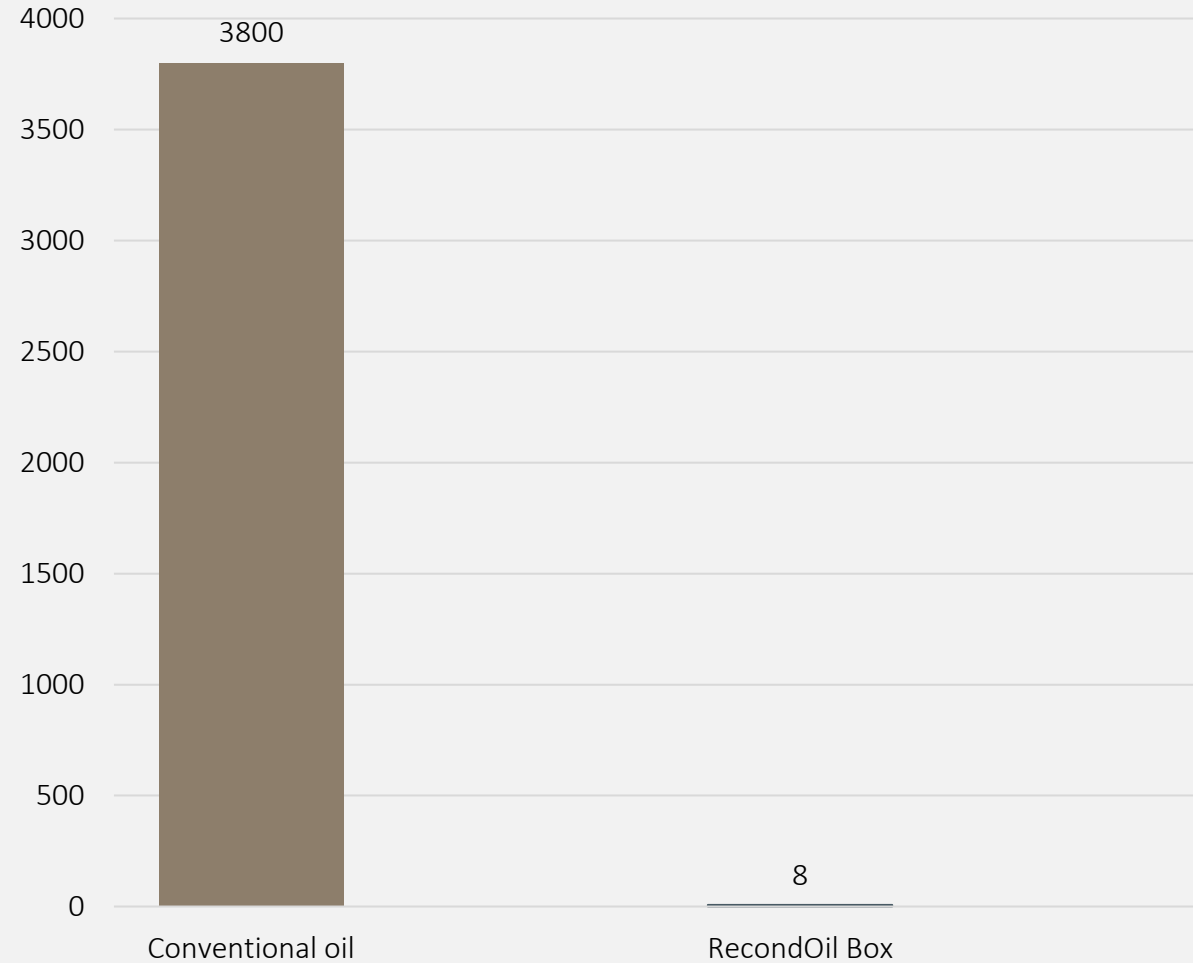
Improved N&V results lead to less bearings being scrapped and a general tighter tolerance for our products – a business benefit!

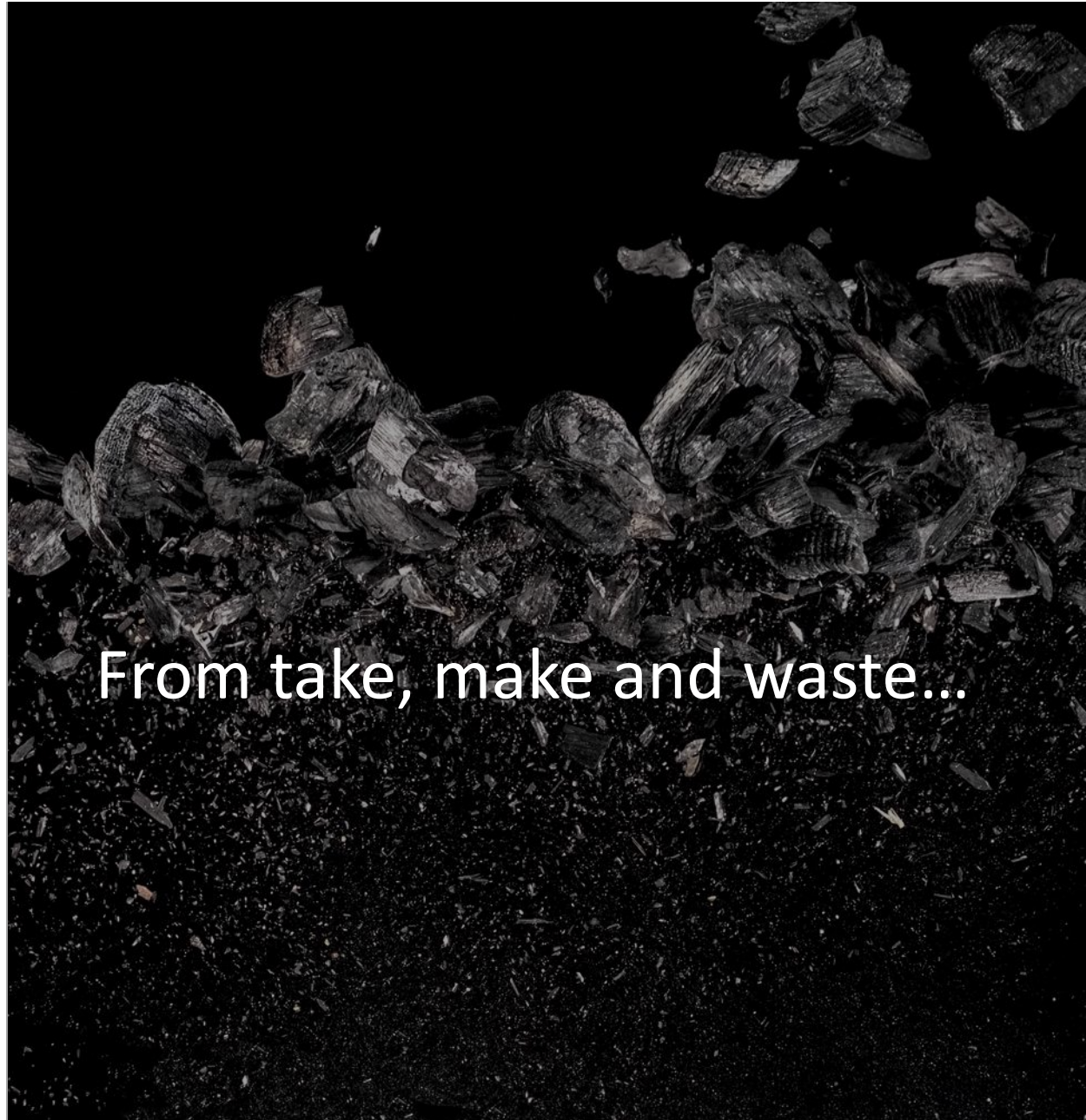
Life Cycle Analysis: CO₂ footprint with a circular use of oil

A CIRCULAR
USE OF OIL
REDUCES CO₂
EMISSIONS BY
MORE THAN
96%.

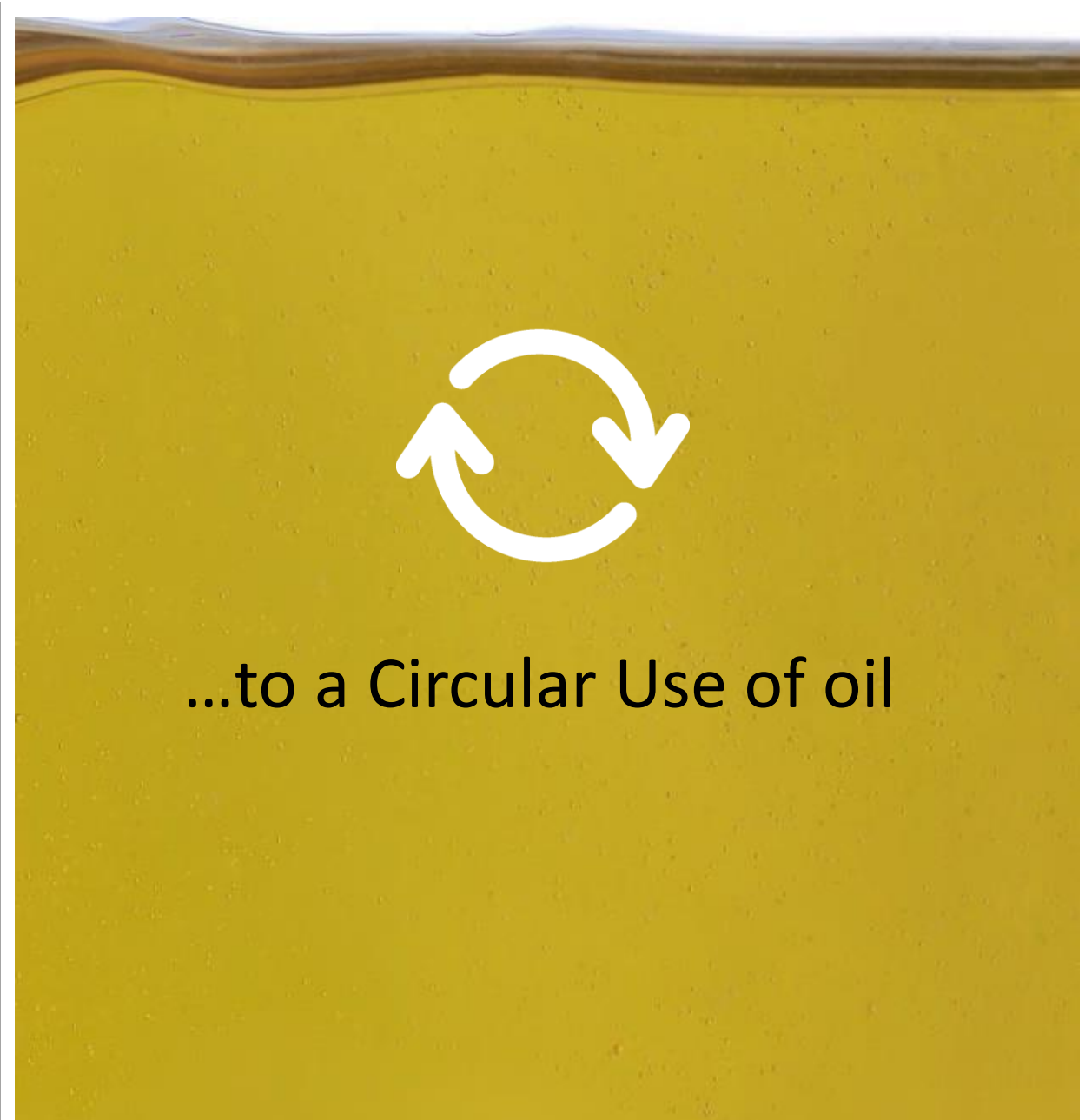
- Conventional oil
- DST systems

kg CO₂-eq. per m³ industrial oil





From take, make and waste...



...to a Circular Use of oil

Circular use of oil – value creation across operations



Sustainability
improvement



Total oil
cost reduction



Performance
improvement

Customer Value

SUSTAINABILITY CALCULATION:

	Kg of CO ₂ savings / m ³ oil	Yearly oil reduction (Liter)	Year 1 Kg of CO ₂ savings	Year 2 Kg of CO ₂ savings	Year 3 Kg of CO ₂ savings
CO ₂ emissions savings	3,800	1,748	6,641	6,641	6,641
Total CO₂ savings on contract period					

VALUE CALCULATION (INR):

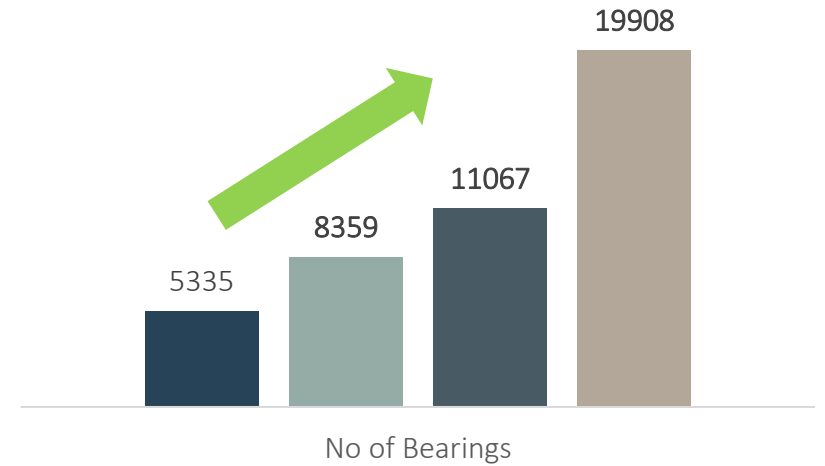
Cost items	Year 0	Yearly cost reduction %	Year 1	Year 2	Year 3
	Current yearly costs		Estimated costs	Estimated costs	Estimated costs
Oil replacement cost	510,000	85%	76,500	76,500	76,500
Oil disposal cost	170,000	85%	25,500	25,500	25,500
Oil change labor cost	20,400	90%	2,040	2,040	2,040
Oil top-up volume cost	12,750	95%	638	638	638
Filter cost for existing filter solution	20,400	75%	5,100	5,100	5,100
Filter change labor cost	10,200	75%	2,550	2,550	2,550
Production downtime cost	408,000	25%	306,000	306,000	306,000
Repair costs (materials)	102,000	25%	76,500	76,500	76,500
Labor cost other equipment repair	40,800	25%	30,600	30,600	30,600
Costs yearly	1,294,550		525,428	525,428	525,428
Costs monthly	107,879		43,786	43,786	43,786
RecondOil Box solution					
Contract length (years)			3		
Equipment Cost			567,545		
Filters and other services cost				161,840	161,840
Installation cost			13,600		
Savings yearly			26,138	571,560	571,560
Savings monthly			2,178	50,607	50,607
Total savings on contract period (INR)			1,240,703		



Remanufacturing

- A remanufactured bearing reduces the carbon foot-print compared to a new one by up to 90%.
- Remanufacturing brings benefits such as reduced lead times, lean operations and often lower costs

Indian Railways
No of bearing refurbished



■ Y2018 ■ Y2019 ■ Y2020 ■ Y2021

Automotive

- The Two wheeler and light vehicle market is driven by energy efficiency, reduction of emissions and electrification
- Today, SKF has a portfolio of innovative solutions that enable robust and efficient E-powertrain drive



Truck Hub Unit



Low Friction TRB



Low Friction DGBB



How we contribute to a better environment



Our products reduce friction



Working with clean technologies



Carbon neutral manufacturing



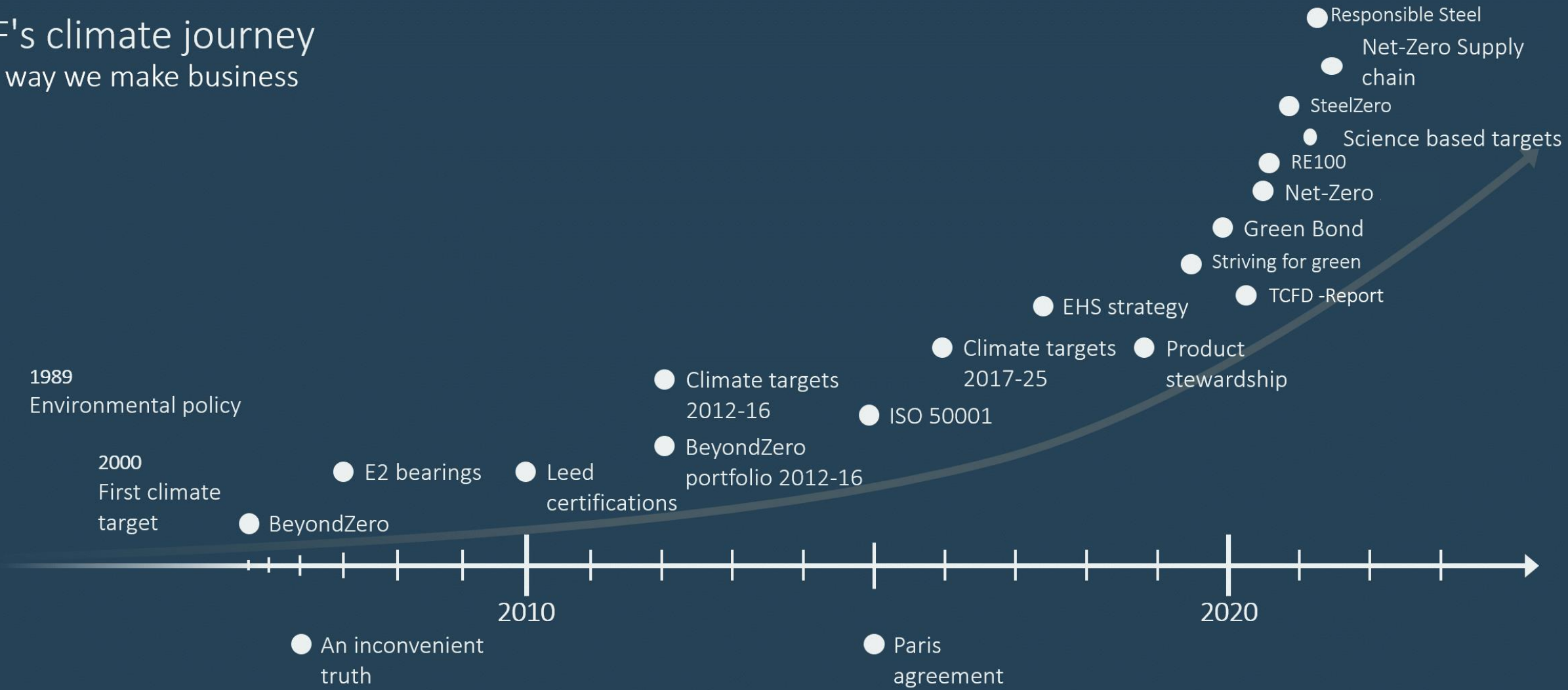
Remanufacturing bearings



New business models

SKF's climate journey

The way we make business





SKF

THANK YOU