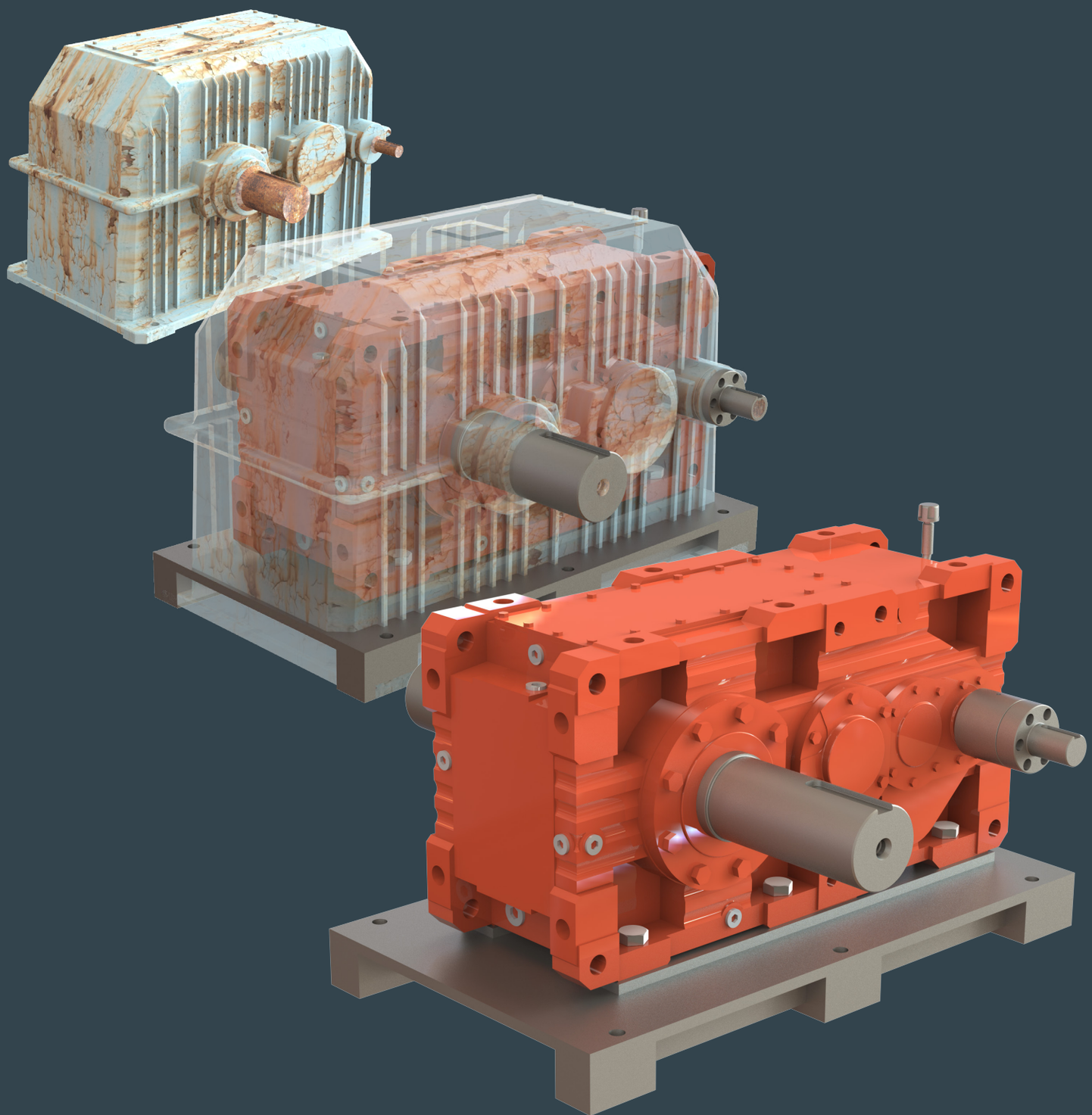
SEW EURODRIVE

DROP-IN REPLACEMENT SOLUTIONS



What is a Drop-In Solution and why should you choose it?

What is a Drop-In Solution?
A new for old replacement which does not require any rework on site.

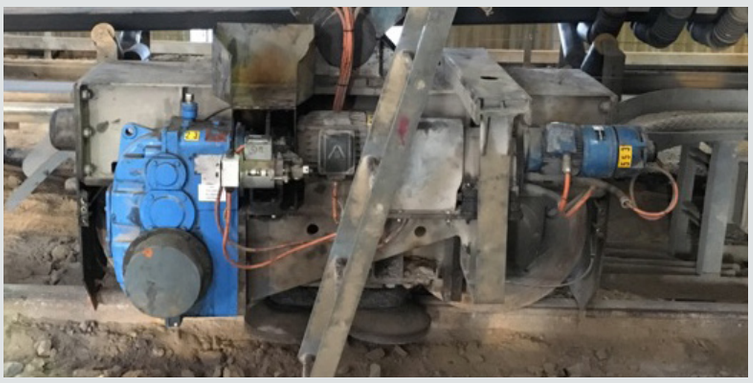
Why choose a Drop-In Solution?

COST SAVING
- Reduced Maintenance Cost
- Less Downtime
- Lower Energy Cost
- We have products available straight off the shelf

PROBLEM SOLVING
- SEW-EURODRIVE can modify to suit your design requirements
- Improved Processes
- Reduced Downtime

RELIABILITY
- Lower Risk of Breakdown for New Equipment
- Less downtime due to less Maintenance
- Improved Design or Rating

SIMPLICITY
- SEW-EURODRIVE's Engineered Ready to Go Solutions
- No modification required on site



Problem Solving Example:
Reclaimer in the Cement Industry

The existing travel drive contained mechanical clutches, which constantly failed. Another big problem was constant crabbing of the reclaimer due to unsynchronised drives.

SEW-EURODRIVE's solution utilised electronic speed control without any mechanical clutches. Encoders on the drives provided constant feedback to the speed controllers ensuring perfect synchronisation of all drives and eliminating crabbing.

No changes required by the customer.
Out with the OLD, in with the SEW.

Maximise your efficiency: Ineffecient Worm Gear VS Modern Replacements

How do you ensure maximum efficiency savings?

It is important to look at your overall drive system, as there can be significantly more efficiency gains than just looking at the motor.

Worm gear units have historically been a cost effective solution; cheap to produce when manufactured in high volumes.

The downside to this solution is that the worm gear slides on the worm wheel causing significant efficiency losses and heat due to friction.

Modern replacements to the inefficient worm gear units include highly efficient helical and bevel gear combinations.

SEW-EURODRIVE helical and helical bevel gearboxes are manufactured using the latest gearing technology.

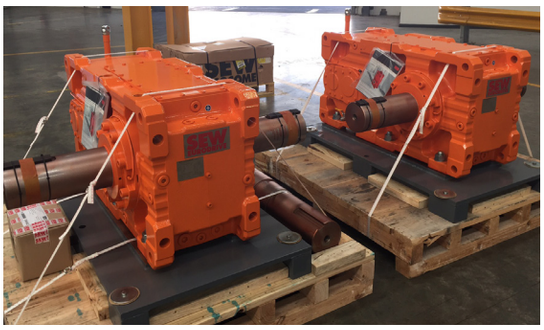
Tooth profile, tooth pitch, and pressure angles together with precision fine ground profiles have been optimised to transmit the highest torque possible, while maintaining highest efficiency levels.

Little Known Fact:

Did you know that the Efficiency Gain between an IE3 and IE2 Efficiency Motor ranges from 1% to 3% whilst the Efficiency Gain between a modern Helical Gearbox and an old Worm Gear can be as much as 45%.

Minimizing Downtime and Costs with SEW's Innovative Solutions:

Replacement VS Repair



The cost of repairing a legacy gear usually exceeds the cost of replacing it with a modern helical gearbox.
Not only do you have to consider the downtime associated with the unit being out of service for repair, but, also the cost to remove it, and then replace it when the repaired drive is ready to go back to service.

SEW's drop-in replacement solution greatly reduces downtime, whilst increasing overall system efficiency and reliability. The X.e Series helical and bevel helical gearboxes are assembled in Australia from locally stocked components, allowing for fast turn-around to meet the requirements of today's industry.

When an ageing drive is ready to be replaced, a modern drive can be assembled, delivered and installed at the same time the old drive is removed, reducing downtime, labour costs and crane costs.

SEW's engineers are able to design and supply a transition base to replace almost any gearbox application.

An SEW design already exists for the majority of existing worm gear units in service. This greatly reduces cost and delivery time.

No site modifications are required as transition bases are designed to match the existing drive's output shaft location and mounting bolt pattern.

The transition bases are supplied with jacking bolt tabs to aid in the alignment of the output shaft.

A new coupling half can be supplied on the replacement drive output shaft that matches the coupling on the application, so there is no need to remove the coupling from the head shaft.

It's as simple as unbolting the old gearbox, bolt the new SEW drive system in, connect the wires, and press start!

Problem Solving Example:
Reclaimer in the Coal Industry

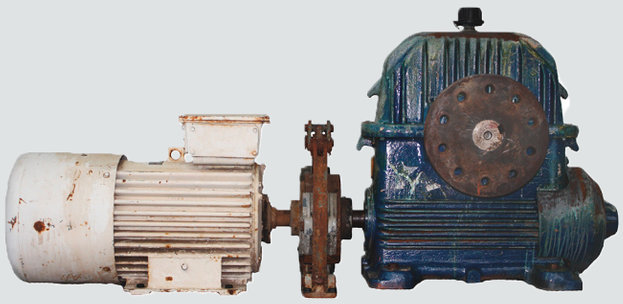
The existing travel drive contained mechanical clutches, which constantly failed. The equipment was too low to the ground driving into spillage piles suffering contamination, which increased the likelihood of failure even further.

SEW-EURODRIVE's solution utilised electronic speed control without any mechanical clutches that are sensitive to contamination.
The drive has been mounted upright to avoid contamination from spillage.

The customers existing staircase and other structure remained as is.

Cost Saving Example

Existing drive system – Overall Efficiency 70%



12 inch worm gear unit with a ratio of 30:1

- Torque capacity:12,300 Nm
- Efficiency: 85%
- Thruster brake
- 225S frame welded steel motor
- 18.5 kW 725rpm
- Efficiency: 82%

The existing drive system consists of a worm gearbox, a mechanical brake with a cone ring style brake drum coupling and a foot mounted motor.

All three components require accurate alignment, the gearbox output shaft needs to be aligned with the application shaft, and the brake requires regular adjustment, maintenance and guarding.

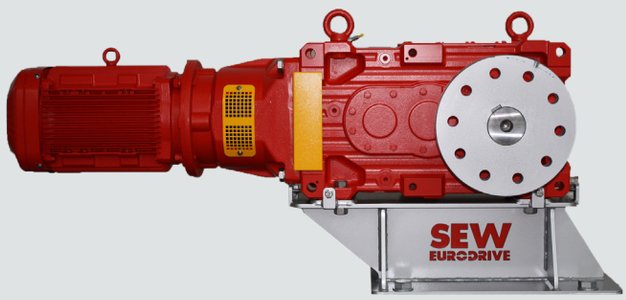
Power Calculations

Assuming the existing system demands the full rated power of 18.5 kW:

- Electrical Input power to the motor to produce 18.5 kW = Motor output power / motor efficiency
  18.5 kW / 82% = 22.56 kW

- Mechanical Output power from gearbox = motor output power X gearbox efficiency
  18.5 kW x 85% = 15.73 kW

New drive system – Overall Efficiency 90%



X3KS120 with a ratio of 61.35:1

- Torque rating: 12,800 Nm
- Efficiency: 96%
- Centrifugal lift-off backstop
- IEC input flange
- DRN180M4
- 18.5 kW 1478rpm
- Efficiency: 94%

The new drive system consists of a high efficiency helical bevel gearbox, and an IE3 premium efficiency flange mounted motor. These components are coupled with a jaw coupling.

A maintenance free centrifugal lift-off backstop mounted in the gearbox has replaced the brake.
A brake motor could be used if a brake is still required.

Power Calculations

Assuming the new system must produce the same mechanical output power as the legacy drive:

- Input power to gearbox = output power / gearbox efficiency
  15.73 kW / 96% = 16.38 kW

- Electrical Input power to motor to produce 16.38kW =
  motor output power / motor efficiency
  16.38 kW / 94% = 17.43 kW

Energy Savings

Old motor input power – new motor input power
22.56 kW – 17.43 kW = 5.13 kW | 5.13 kW / 22.56 kW = 23%

Based on $0.30 to $0.50 per kWh and 24/7 operation.
The energy saving equates to $1.54 to $2.57 per hour which is an annual saving of $13,500 to $22,400.[1]

You will not only be saving money but saving the planet too.
This example will save 41 tonnes of greenhouse emissions every year.[2]

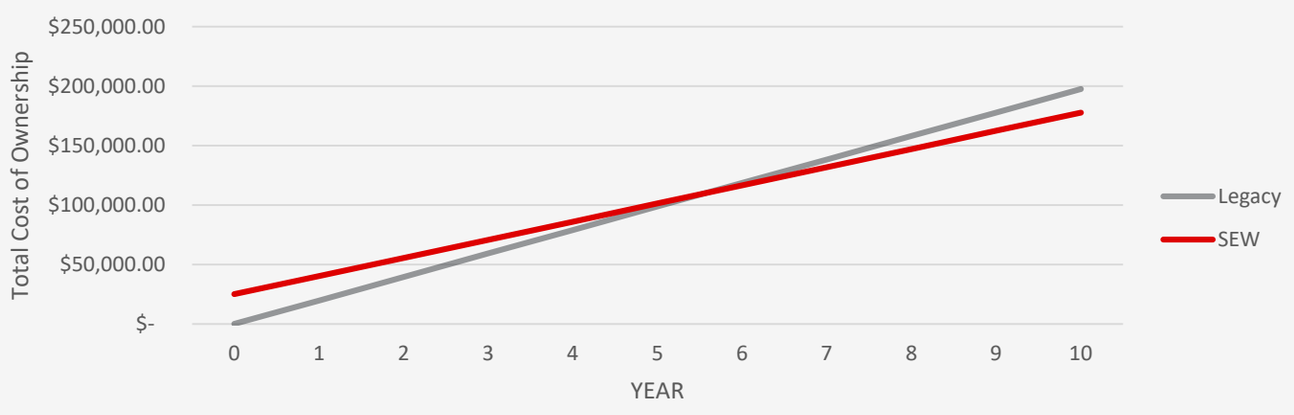
Total Cost of Ownership (TCO)

Regardless of your situation even the weakest use cases can still benefit from a drop-in solution. If you would like to know exactly how much you could save please contact SEW-EURODRIVE and our engineers will assist you based on your specific equipment and circumstances.

Example 1 (Weak Case):

- Low electricity rate of 0.30 $/kWh
- Daytime only operations of 8h/day
- No inflation in power prices
- Legacy unit not requiring any servicing

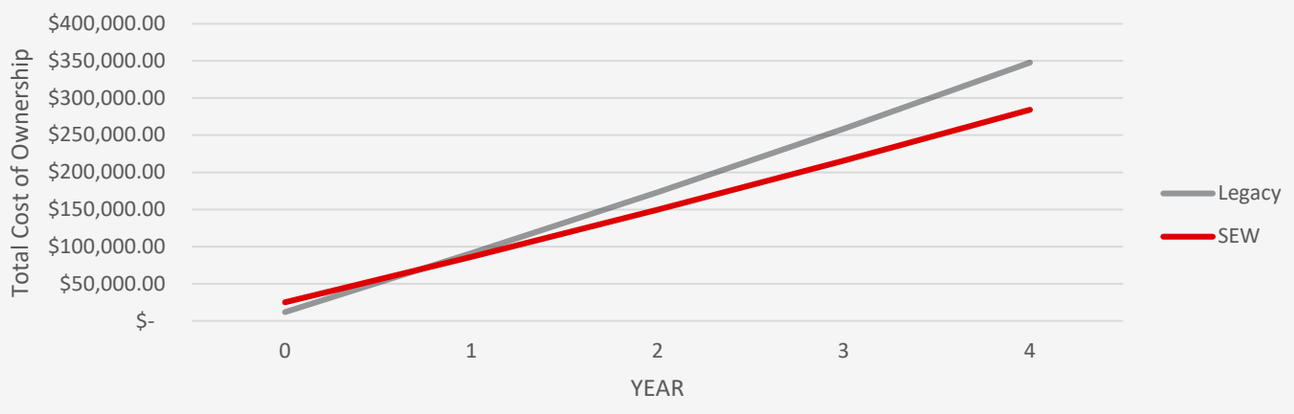
Result: Amortisation in **6.5 Years**



Example 2 (Strong Case):

- Average electricity rate of 0.40 $/kWh
- Continuous operations of 24h/day
- Inflation rate on power 4% pa
- Legacy unit requiring a service

Result: Amortisation in **less than 1 Year**



* 1: Average Market Rate for SME Customers varies strongly based on State and Supplier. The estimated range roughly covers the entire range in Australia for the 2023 Calendar Year.*

2: using a Ratio of 0.92 kgCO2/kWh as per Origin Zero June 2023.

SEW EURODRIVE

COMPANY BACKGROUND

The SEW-EURODRIVE group is a global designer and developer of mechatronic transmission systems and motor control electronics, headquartered in Bruchsal, Germany. Its broad spectrum of integrated solutions includes geared motors and gear units, high torque industrial gear units, high-efficiency motors, electronic frequency inverters and servo drive systems, decentralised drive systems, plus engineered solutions and after-sales technical support/training.

The Australian division of SEW-EURODRIVE is headquartered in Melbourne and is supported by a network of offices in Sydney, Brisbane, Mackay, Perth, Adelaide and Newcastle. A comprehensive service and technical support centre is located in Melbourne, and complemented by assembly facilities in both Melbourne and Sydney. The company's customer base includes large-scale corporations and smaller entrepreneurial enterprises across Australia.

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