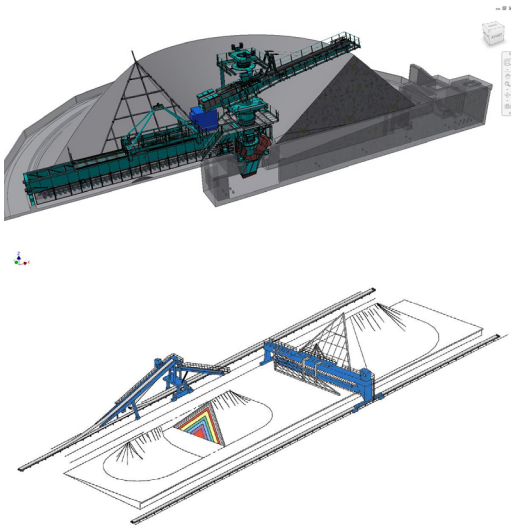
Making the TCO case for automated materials handling

When it comes to investments in bulk materials handling equipment, traditionally only the initial capital cost (CAPEX) of equipment is considered in the analysis of the various options. This approach favours the selection of mobile equipment, such as wheel loaders, trucks and dumpers. But although mobile equipment is less capital intense than an automated materials handling solution based on stackers and reclaimers, this is only the start of the story.



To read beyond this first chapter, it is important to also understand the operating costs (OPEX) of the different materials handling options and how these contribute to the total cost of ownership (TCO). And when these aspects are considered, automated materials handling has the advantage with benefits including:

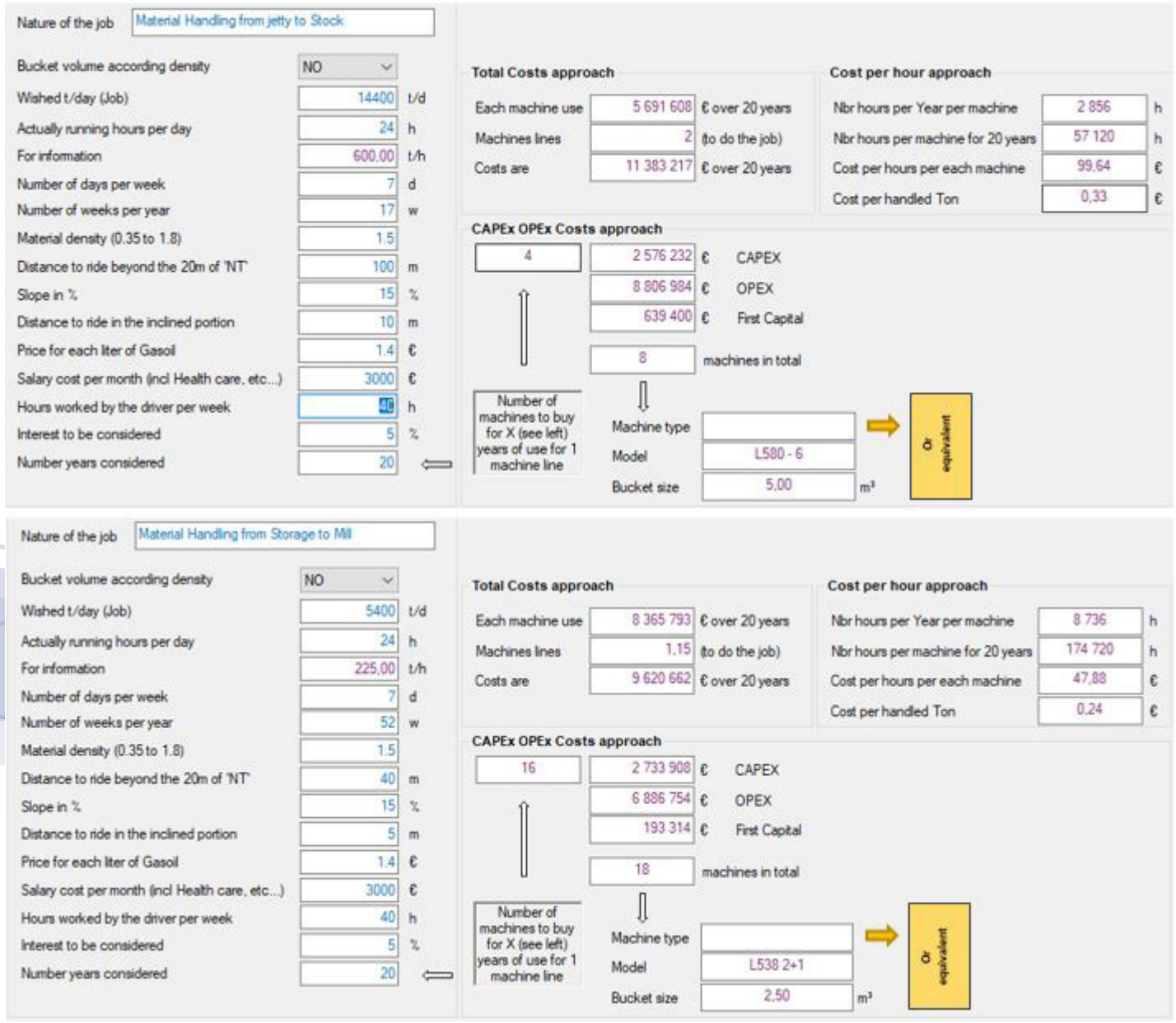
- Lower fuel and power consumption.
- Lower maintenance costs (lower wear, spare parts requirements etc.)
- Lower labour costs.

Automated materiald handling also offers benefits beyond those that are simply cost based, including improved health and safety and environment performance, and that contribute to the long-term sustainability of the operation.

In the past, however, the TCO benefits of automated materials handling have been difficult to quantify in a way that customers can easily incorporate into budgets. This challenge was taken up by Claudius Peters Technologies SAS (CPTSAS), which has developed a new software tool to calculate the TCO of mobile equipment.

CPTSAS is a long-standing provider of automated materials handling equipment to a range of industries, including cement, fertilizer, coal, gypsum, alumina/aluminium, with installations up to 4500 t/h. To develop the software, CPTSAS has taken this expertise and combined it with the experience of two former product managers at a globally-known supplier of wheel loaders to ensure the credibility of the calculations. The result is a tool that allows customers to incorporate TCO into investment decision, rather than relying on basic CAPEX calculations.

Take a typical application as an example: material handling at a port for a clinker grinding plant. Clinker is



Calculating the TCO for a wheel loader operation over a 20-year period.

brought in on ships of 15,000-30,000 tonnes capacity and unloaded by shipunloader. The clinker is then to be stockpiled at a rate of 600 t/h and reclaimed to the mill at a rate of 225 t/h.

Wheel loader CAPEX and OPEX for a 20-year period are calculated in Figure 1 for both stockpiling and reclaiming operations. The bottom line: initial CAPEX of €5.3 million plus OPEX of €15.7 million for a TCO of about €21 million.

In comparison, an automated materials handling system requires a slightly higher initial outlay, at about €6 million, but OPEX is considerably lower at only €3 million over a 20-year period. This gives a TCO of €9 million – or less than half of that of the wheel loaders (Table 1).

	Automated system	Wheel loader	
	Stacking + Reclaiming	Storage	Reclaiming
CAPEX	€6,000,000	€2,576,232	€2,733,908
OPEX (20 year period)	€3,000,000	€8,806,984	€6,886,754
TCO	€9,000,000	€21,003,878	

Considering TCO alone is thus a strong argument in favour of automated material handling systems, which help achieve a more cost-effective operation at a time when many heavy industries are highly competitive. But as mentioned above, the benefits do not end there.

Removing mobile equipment from a work site inevitably reduces the risk of accidents and lowers the overall number of workers required on site at any given time. Fewer machines and lower maintenance requirements also reduce the number of human-machine interactions. All of this will help to improve the health and safety of a materials handling operation.

Automated materials handling installations also have lower dust and air pollutant emissions compared to diesel-based mobile equipment – another benefit to worker health, as well as reducing the environmental footprint of an operation. In an age when the importance of environmental considerations is only likely to increase when making investment decisions, not to mention in maintaining social and regulatory licence to operate, automated materials handling therefore offers a more resilient solution to these long-term trends.

About Claudius Peters Technology SAS

CPTSAS is a subsidiary of German industrial engineering specialist, Claudius Peters Group, specialising in the supply of materials handling equipment. Its portfolio of products includes stackers, reclaimers, belt conveyors, and hoppers, which can be offered on a semi-turnkey and turnkey basis. Claudius Peters Group is a part of British engineering and industrial group, Langley Holdings, and operates worldwide with regional offices in the Americas, Europe, China and India.