



## Smart energy solutions mean every paint job is green

Having cut the fuel consumption of its vehicles over the past few decades, Volvo Trucks is now improving the environmental footprint of its facilities. With reduced energy and paint use and lower emissions of solvents, its northern Swedish paintshop is the most environmentally sustainable unit of its kind in the world. Even so it can offer customers more than 850 colours to choose between.

You need about 20 litres of paint for a single truck cab, and each cab must then be baked in an oven to harden the finish. Multiply this process by tens of thousands of vehicles each year – not to mention the heating and cooling needed for other parts of the paintshop – and it becomes clear that such a facility could potentially have a huge impact on the environment in terms of materials and energy.

But with heat from trash, cooling from nature and paint consumption nearly halved, Volvo Trucks' paintshop in Umeå, northern Sweden, has become a shining example of how smart thinking can shrink the environmental footprint of a major industrial facility.

### **Emissions down, investments up**

For many years now, staff at Volvo Trucks' paintshop have been focusing on reducing the emission of solvents into the air and improving energy efficiency. Every stage of the painting process has been mapped, right down to the smallest detail. Everyone has been encouraged to come up with suggestions and ideas, and major investments have been made. The results are impressive. Between 1999 and 2008, energy consumption was reduced by 30 per cent. This success is even more remarkable in view of the fact that the amount of painting being undertaken has increased significantly during the same period, partly because of the fact that plastic components that were previously painted in Belgium are now painted in the Umeå paintshop.

“When components are not painted in the same place, it's incredibly difficult to make sure they are the same shade as the rest of the cab. That's why we chose to bring them here,” explains Hans Venngren, Volvo Trucks' global process manager for surface treatment.

Energy savings have been achieved by re-using the air in the spray booths and at the plant. The air in the plant is used as incoming air in the painting process, while around 75 per cent of the air in the spray booths is re-used. As a result, the need for air brought in from outside has been dramatically reduced.



### **Fuel from waste**

Improved operational planning, such as turning off machines when there are gaps on the production line, has also helped reduce energy consumption. Other energy-saving measures include the installation of energy-efficient electric motors.

“When we started jointly painting the plastic with the cab, the temperature in the paint-hardening ovens was cut by more than 50 degrees and this naturally reduced the need for energy,” says Venngren. “Since we required lower temperatures, we were also able to switch from liquefied petroleum gas (LPG) to district heating to heat the ovens.”

District heating – fuelled in part by converting domestic waste into energy at a nearby power plant – has also replaced oil in the heating process and the remaining LPG in the afterburning system is now being replaced by environmentally friendly dimethyl ether (DME) produced from biomass.

### **What a cool idea**

One of the most spectacular energy savings, however, comes from the plant’s cooling system. The Umeälven river flows just outside the plant and under it there is an underground river that is always cold, regardless of the season. This cold water is pumped through a two-kilometre pipe system into the pipes at the plant. “We then use the water in various cooling systems,” says Venngren. “This has enabled us to replace many of the cooling machines that used refrigerants such as CFCs\*.”

The paintshop has been modernised and production has been streamlined in several different phases and, as a result, the use of paint and solvents has been significantly reduced, together with emissions into the air. In 1988, these emissions were approximately 70 grams per square metre of cab surface painted.

“The corresponding figure today is less than 10 grams, which is a fair bit below the EU’s limit of 55 grams per square metre. Even if we still have some way to go, we are still really satisfied with the work we have done,” says Venngren.

### **Nailing the right colour**

While it is its environmental performance that has attracted attention, the Umeå paintshop is also remarkable for the sheer range of colours it is able to apply for truck cabs. “We are able to comply with virtually any customer request,” says Denny Westerlund at Volvo Trucks’ communications department in Umeå. As a somewhat extreme example he cites the case of a customer visiting the plant to order his new vehicle, accompanied by his wife. When the customer was asked what colour he wanted for the cab, he shrugged and turned to his wife. A truck driver herself, she hesitated for a moment before holding out her painted nails and saying: “I want this colour.”

“No sooner said than done,” says Westerlund. “They took a sample of her nail polish and then started running tests to reproduce it. In the end she got a cab that matched her nails. This gives some idea of what we can do.”



Volvo Trucks takes great pride in the massive range of colours available at its Umeå paintshop. The palette extends to some 850 hues, tints and shades, which means that customers are certain to get the exact match for their livery or existing fleet. Winter White may be the most-chosen shade among Volvo Trucks' customers, but green will never go out of style.

\*CFC stands for ChloroFluoroCarbon compounds, also known as freons.

## **Facts about Volvo Trucks' paintshop in Umeå:**

### **Top-ten colours**

Even though the Volvo Trucks paintshop in Umeå has more than 850 colours to choose between, it goes without saying that not all of them are used that frequently. Here is the top-ten list:

1. Winter White
2. China Red
3. Signal Yellow
4. Ruby Red
5. Volvo Blue
6. Cream White
7. Royal Blue
8. Clean White
9. Gentian Blue
10. Indian Red

### **41,000**

The number of MWh by which the Volvo Trucks paintshop in Umeå reduced its energy consumption between 1999 and 2008.

### **Paint consumption**

Paint consumption was reduced from 34 litres per cab in 1999 to 20.2 litres in 2008, a reduction of 41 per cent. When the recently introduced painting of plastic components is included, the reduction in paint consumption will be 44 per cent. This corresponds to savings of 1.4 million litres of paint and solvent which will not need to be produced, transported and handled.

