Tackling the unseen environmental dilemma

SLOPS | Port waste is currently climbing the maritime industry's sustainability agenda. France-based Ecoslops has developed an oil waste processing plant that combines an innovative petroleum refining process and a clean water recycling scheme into a micro-refinery, writes Vincent Favier, Ecoslops' CEO.

Large amounts of slops are produced every year

Sustainability has been at the forefront of many shipping industry debates in recent years, and even more so since the industry's omission from the COP 21 agreement on climate change last December in Paris. While the loudest environmental debates focus on emissions, the issue of port waste is climbing the agenda. Earlier this year, the European Sea Ports Organisation (ESPO) named ship and port waste a "top ten" environmental priority for European ports in 2016. It is a topic gaining real traction, and pressure is mounting on ports and shipowners alike to tackle this challenge in a sustainable and commercially viable way.

Over 98 million tonnes of slops are produced every year by the world's commercial fleet, all of which needs to be disposed of in line with strict International Maritime Organization (IMO) and European Union (EU) regulations. Instances in which these regulations have been flouted have resulted in environmental catastrophes such as the Trafigura incident. The Dutch multinational commodity trading company was accused of knowingly "dumping" 500 tonnes of a mixture of fuel, caustic soda and hydrogen sulphide from a chartered vessel, *Probo Koala*, at the Ivorian port of Abidjan in 2006. The gas caused by the release of the chemicals was blamed by the Ivory Coast government for the deaths of 17 and the injuries of over 30,000 Ivorians, and led to Trafigura settling a class action suit.

This is not an isolated incident. Earlier this year, the German shipping company MST Mineralien Schiffahrt was indicted for violating the Act to Prevent Pollution from Ships. It was accused of failing to maintain an accurate ship record on the disposal of oil-contaminated waste, and of handing over falsified records to the US Coast Guard.

Both of these incidents occurred despite the regulatory requirement to sustainably dispose of slops under the regulation MARPOL 73/78 as well as EU law (59/2000/EC directive). This highlights the ongoing challenge of enforcing regulations within shipping and the absolute need to provide a cost-effective and systematic way to dispose of waste from ships.

In recent years the traditional route for slops disposal has become more difficult. While in the past slops were sold to markets such as the building and construction industries, the sustained drop in crude oil prices has encouraged these buyers to purchase purer, cleaner fuel products with no sulphur, sediment or metals.

The lack of a buyer for slops has resulted in a buildup in ports because many do not have adequate port reception facilities, which means tanks are becoming physically full. Port authorities can't authorise vessels to leave port without discharging the slops, yet they have nowhere to dispose of them. In short, the situation is threatening to interrupt shipping operations, causing downtime that companies cannot afford as well as environmental and sustainability issues in local port communities. This difficulty in disposal can increase the temptation for companies to illegally dispose of their slops, with negative environmental and social consequences.

To address this problem, Ecoslops has developed a micro-refining technology that sustainably treats slops, recycling them into fuel products (MDO and IFO) and XFO (light bitumen) that comply with international standards. While the principle and design of the technology was well established, Ecoslops conducted further research to develop an oil waste processing plant (OW2P) that combines an innovative petroleum refining process and a clean water recyling scheme into one, small treatment unit: a micro-refinery. The process and technology work as follows: First, to optimise distillation, the slops are pretreated. They are heated, decanted and, using high-speed vertical centrifugation, the water, hydrocarbons and sediments are separated before the refining and distillation process. As the reprocessing of the water from the slops is fully integrated into the treatment process, the water is depolluted using the latest techniques. It is then returned to its natural environment in line with international and local environmental laws. After the water and sediment are removed, the slops are sent to the P2R vacuum distillation column, where they are heated to 400°C. Under vacuum conditions as well as the "overflash" process implemented by Ecoslops, the hydrocarbons and heavy molecules are vapourised. At the end of the distillation process several fuels are produced, including naphtha, marine fuel (distillates and IFO) and light bitumen. This fuel can be sold back to the marine and construction markets.

Ecoslops' first refinery, in the Portuguese port of Sinès, commenced industrial operation in 2015. To date, over 10,000 tonnes of slops have been recycled, with 98% of slops converted into new fuels. This success has enabled Ecoslops to fast-track expansion plans, developing projects in the Romanian port of Constanta and port of Abidjan, as well as working on new sites in the ARA region (Antwerp-Rotterdam-Amsterdam), the Mediterranean, Middle East and South Africa.

In recognition of Ecoslops' development, the Green Award Foundation, a not-for-profit quality assurance organisation, announced an incentive agreement with Ecoslops in April 2016. It will see Ecoslops provide a 25% discount to all Green Award-certified ships, reducing the costs of slops disposal for shipowners and ensuring their sustainable recycling into valuable fuels.

The progress that has been made, together with the ramp-up of Ecoslops' expansion plans and the partnerships the company has developed, demonstrate the technology's credibility and viability. Most importantly, it shows that there is now a solution to ease the burden of slops disposal from vessels in a sustainable and commercial way, with real benefits to all stakeholders as well as to the wider marine environment.