



# Energy savings in the spotlight

## Pulau Bukom refinery focuses on improving energy efficiency

**P**ulau Bukom refinery in Singapore is Shell's largest oil refinery and produces 400,000 barrels a day of refined products. The refinery has a long and successful history but now faces increasing regional competition and needs to become even more cost-effective. One of the refinery's major costs is energy, and a recent improvement programme with Shell Global Solutions has helped Pulau Bukom to focus on making additional savings in its total energy bill.

Teo-See Beng Chu, Refinery Technology Manager, Shell Eastern Petroleum Pte Ltd, states, "Energy is a significant part of our costs, and we must be continually looking for ways to improve our energy efficiency and reduce greenhouse gas emissions as part of our journey to becoming a world-class refinery."

Before the energy-management programme, efforts were already being made to reduce energy consumption at Pulau Bukom. In 2003, an energy-improvement team investigated energy use. The team of operational and technical staff identified ways to reduce energy consumption, for example, reducing furnace-fouling problems caused by catalyst fines in fuel oil streams and championing

a site-wide programme for steam trap maintenance. Encouraged by these initial findings, Pulau Bukom refinery then decided to use energy-management services from Shell Global Solutions to continue its energy-reduction programme.

The energy-management programme started in 2004 and began with a review of the activities across the whole site to identify energy-saving opportunities. A period of consultation with site personnel followed, and the ideas were developed into individual projects. Most projects required support from technical, maintenance and operational staff, and all were organised around the day-to-day running of the refinery so that production was unaffected.

Eric Petitcollin, Refinery Production Unit Manager, Shell Eastern Petroleum Pte Ltd, says, "We only had a 12-month period to define and implement all the agreed energy projects. It was essential that Pulau Bukom and Shell Global Solutions staff worked as one team so that progress was as efficient as possible."

By the end of the programme, 19 projects had been implemented. Other projects are now in progress with the aim of further reducing the refinery's energy use.

The level of teamwork between Pulau Bukom and Shell Global Solutions provided a solid base for success during the 12-month programme. David Tjoe, Refinery Energy Co-ordinator, Shell Eastern Petroleum Pte Ltd, stresses the need for Pulau Bukom personnel to continue applying the methods established during the energy-management programme: "It was crucial for operations staff to be involved in the initial programme. They now have the information to indicate if the projects are still performing. 'Energy adviser' spreadsheet tools are used by operational staff as part of the daily management activity in each process area at Pulau Bukom. The package calculates the actual performance against the target, and appropriate actions are suggested to address any deviations that occur."

Beng Chu adds, "The challenge now for Pulau Bukom is to maintain the improvements on an ongoing basis so that the savings made are not lost."

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