CASE STUDY: Sustainable Development

Shifting Paradigms

Aitken Spence Power, the Company's power generation business, was the first power generation company in the country to obtain all three certifications: ISO 9001 for quality, ISO 14001 for environmental conservation and OHSAS 18001 for occupational health and safety management. It operates three power plants - in Horana, Embilipitiya and Matara – which employ sustainable processes and international best practice to maintain and improve the quality of the power generation process.

As required by the Central Environmental Authority, our power plants are regularly monitored to ensure emissions, effluents, solid waste and noise generated are within legally accepted levels while water is treated to ensure that chemical content does not exceed stipulated limits. Furthermore, none of the power plants are within close proximity to protected areas.

Resource efficiency

The engineering teams at all 3 plants continuously improve the efficiency of equipment with a view to saving energy. Significantly, there is no reduction in production capacity to achieve these energy savings at any of the plants.

Among initiatives taken during the year was the reduction of the heavy oil used for power generation in Horana, by introducing a combustion improvement unit to the fuel system. The resulting fuel saving amounted to 1g/kWh; the total fuel saved during the year being 102,572 kg. An audit was also carried out at Horana to indentify areas of high energy consumption.

In Embilipitiya, the Company introduced new techniques and practices to save energy and provide a more energy efficient service. A special procedure was introduced for operational staff to follow during plant stops in order to reduce maximum kVA demand, which dropped by 36% as a result. Variable Speed Drive (VSD) units introduced for the engine radiator cooling fans also saved 598 MWh of energy per annum. Further improvements planned for the plant include a VSD unit for the engine hall ventilation fans and a CI unit for the engine fuel system, both of which are expected to come on board in 2011/12.

The Matara power plant uses energy efficient products and sources to save energy and converted the existing lighting to energy saving lights. The plant also performed an augmentation of its transmission line to ensure a more efficient dispatch of energy to the national grid. On the cards for 2011/12 are further energy saving measures including the replacement of existing conventional airconditioning units to inverter type units which are 20% more energy efficient and the introduction of VSD units to the auxiliary bay fans which makes the energy consumption of these fans 10% lower.

Total water withdrawal at the power plants amounted to 10,694 m^3, 18,000 m^3 and 6,349 m^3 for the Horana, Embilipitiya and Matara power plants respectively during the period from December 2009 to December 2010, with Embilipitiya sourcing water from groundwater wells. No toxic or untreated waste water is released into the environment.

Of the total water consumption at our power plants, the usage is divided between housekeeping, staff usage and usage for maintenance of engines and other electrical units. Waste water generated from general use in restrooms and kitchens is directed to sewage pits.

Waste water contaminated with oil from maintenance operations is treated at a filtration unit which separates oil from water; the sludge thus collected is sold to a third party. The separated water is stored in separate tanks which have special storage for water with a contamination level higher than 10ppm (parts per million). Usable water is reused for gardening and to clean roads. The treated water at the plants is tested for contamination every quarter by the Central Environmental Authority. The Company has been successful at all these tests.

Impact on biodiversity

The Central Environmental Authority (CEA) must issue a mandatory Environmental Protection License for the

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maintenance of power plants in Sri Lanka. While meeting the CEA criteria, Aitken Spence performs above minimum compliance and has obtained ISO 14001 certification, an indication that significant environmental impacts have been assessed and the activities that cause these impacts are controlled to minimise, and where possible mitigate, the impacts.

With any power plant, one of the impacts on the environment is the transmission line corridor from the power plant to the nearest substation. Our power plants have relatively short transmission line corridors – 500m in Horana, less than 1km in Embilipitiya and 3km in Matara. These lines restrict the height of trees along their path to 25 m but do not restrict movement of animals along pathways.

The thermal discharge or the waste heat from the power generation is dissipated to the environment through exhaust air and radiators. Thus no water is used to remove heat from the plant thereby limiting damage to aquatic biodiversity. No heated water is released to the environment from any of the three power plants. Our plants convert 40 – 43% of the total fuel energy (HFO) to electrical energy and the remaining energy is dissipated through other means such as exhaust air (30%), heat generated (20%), lubricant oil (5%). Of the heat generated, 30% is discharged into the environment through exhaust air and the amount of heat dissipated from each plant will depend on the capacity of the plant (Horana and Matara have a capacity of 25MW each and Embilipitiya has a capacity of 100MW).

Heat generated in other parts of the operation is managed through technologies which are continuously monitored. The engineering teams at all 3 plants are constantly seeking ways to improve the efficiency of the plant's operations. For example, radiator fan energy consumption at the Horana Plant was reduced by increasing the cooling capacity of air by developing a Programmable Logic Controller based system which is capable of reducing the total energy consumption of radiator fans on average by 1.6 MWh/Day. This has been in operation since November 2009. At the Embilipitiya plant, cooler modifications were carried out in 2009 leading to a cost saving of over Rs. 9 million and an energy saving of over 2,389.3 MWh per annum.

All three power plants have taken necessary steps to mitigate the significant direct and indirect impacts on biodiversity due to operations. There have been no reported incidents of significant spills during the year and no invasive species were introduced in maintaining the natural eco– systems around the power plants.

Embilipitiya model garden

The Ace Power Generation plant in Embilipitiya is a paragon of sustainable practice even in a global industry known for pollution.

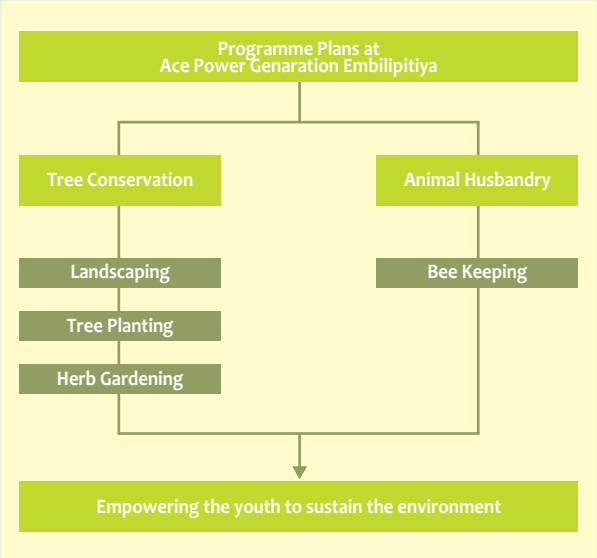
All emissions, effluents and solid waste are within legally accepted limits and robust management and control systems are in place to mitigate environmental damage.

The Embilipitiya power plant has also introduced a 'Model Garden' in a bid to improve the environment. The garden is spread across 34 of the plant's 44 acre property and accommodates about 10,000 to 15,000 plants, medicinal herbs, agricultural projects, animal husbandry and bee keeping projects.

The herb garden is home to many plants of ayurvedic value such as Eth Demata, Thelambu and Aralu and attracts rare species that are unique to the locality such as the Danduwelbaya (little bee) and Salabaya (butterflies and moths).

Recognising the area's potential for agriculture, the plant has taken steps to develop agricultural skills of youth in order to promote local industries. The animal husbandry area is used to educate youth on industrial bee keeping and the premises are also used as a teaching ground for young entrepreneurs keen on learning the art of landscaping. The plant also conducts tours of the Model Garden to educate school children and youth in the vicinity in the long term aim of preserving the biodiversity of the Embilipitiya area.

The programme plan is illustrated below:



The environmentally friendly practices of the plant have left a lasting impression on the community.

As Amal Thushara, an employee at the plant who has worked there since its inception and has risen to the rank of plant assistant technician from his former general helper status, says- " A real change, and a change for the better has taken place through the various services offered by the plant. Everyone is pleasantly surprised because as soon as they walk through the gates of the plant they can see the difference. The plant is open for viewing 3-4 times a week and this greatly benefits the school children too. Also the plant and the Company help the community no matter who they are. This good will and good reputation is beneficial to all of us who work at the plant as well. This plant is a plant with a difference"

Community development

Noting the scarcity of fresh water, the company has also provided access to fresh water to the local communities in Embilipitiya by constructing 6 water tanks and a ground well for the benefit of over 2000 families at a cost of approximately Rs. 2 million. It has also focused on the supply of electricity to the villages and developing roads in Matara, all of which have been executed with of labour sourced locally.

Our power plants in Matara and Embilipitiya have contributed significantly to the infrastructure development of their immediate communities. Details of the projects carried out by the power plants will be posted on our website.

Although Ace Power has no written policy or a standard procurement budget for local purchasing or employment, all three power plants have contributed significantly towards building the economy of their immediate neighbourhood. For example, the Embilipitiya power plant employs over 50% of its staff from the local community. The plants also work with local suppliers, who are selected through a rigorous process that includes factors such as their EMS performance, usage of resources and environmental impact.