NSI was familiar with Energy Management System (EnMS) Standards long before the implementation of EnMS in line with ISO 50001. In fact, NSI is already certified to ISO 9001, ISO 14001, OHSAS 18001 and is also a holder of the Responsible Care verification certificate.

The implementation of EnMS was strongly supported by the commitment of the top management of NSI and the active participation and awareness of the employees, which was a major enabler for the system’s continuous improvement. The existing knowledge of management systems served as an important backbone for implementing the Energy Management System.

By implementing a structured approach under the guidance of the United Nations Industrial Development Organization (UNIDO) Industrial Energy Efficiency (IEE) Project, NSI has been able to apply extensive solutions to reduce their energy consumption. In order to enable effective monitoring of the EnMS’ progress, the necessary monitoring devices have been installed on machinery, and the defined SEUs will further optimize the energy programme. EnMS approach has helped NSI to transform from a project-oriented company into an energy conscious company.

Action plans

Before joining the UNIDO IEE project as a pilot company, NSI had already conducted energy conservation practices through an Environment Management System program, which did not focus exclusively on energy and made technical aspects a priority. As a result, the following energy cost measures were undertaken:

* Strengthen and more intensively monitor and control each operation parameter of the process equipment categorized as SEUs.
* Increase focus on improving utility supply-demand management, especially steam demand management due to its identified position as the biggest energy waster.
* Optimize the operation of cogeneration and boiler in order to attain greater operation efficiency.
Less improvement opportunities were found in process equipment due to tight operational controls on quality and process reliability. However, NSI continues to seek out opportunities to improve their energy performance.

During the UNIDO project, NSI realized the need to establish a baseline as a starting point to better measure the impact of implementing the EnMS and associated energy solutions. At the end of the project it became clear that operational control of the whole system is of great importance.

**Sustainability in the long term through certification**
A structured management system brings sustainability to the implemented improvements through the annual planning process. As such, NSI decided to go for ISO 50001 certification, officially being certified in October 2015 after the completion of the required certification audits.

Due to intensive and well-planned energy performance monitoring of each SEU, the company has seen improvements in their energy performance. The graph below depicts the performance monitoring to date.

In 2015, NSI faced some problems with the cogeneration equipment which led to inefficient energy consumption being identified by the EnMS; these problems have now been resolved.

For 2016, NSI has set an overall energy intensity target to reduce their consumption in 2016 as compared to 2014 numbers.

The total saving resulting in 2016 approximately 1,700 TOE, equivalent to 19,771,000 KWh or 4,200 ton CO2 reduction and cost reduction US$ 1,100,000.

**Added benefits of EnMS**
NSI believes that the UNIDO IEE project has given them real and sustainable benefits, providing them with a system approach rather than solely carrying out individual energy savings measures. By joining the project, the top management has been actively engaged in the EnMS and NSI has recognized the following benefits:

* Improved employee morale
* Implementation of energy efficiency programmes have become more systematic and sustainable
* The EnMS will lead to an accountable programme of energy conservation
* Shared knowledge and experience due to a strengthened professional network of energy conservation experts and energy-oriented companies
* Improved relations with government ministries (for instance, the Ministry of Energy and Mineral Resources (MEMR) and the Ministry of Industry (MOI)) through their support of energy conservation activities.

* Became the second winner of National Energy Efficiency Award in 2016, held by the Ministry of Energy and Mineral Resources.