

Industrial Energy Efficiency Project THAILAND

For the introduction of a structured approach to energy management in their operations, Khao C.P. Company Limited (C.P. Rice) has joined hands with the United Nations Industrial Development Organization (UNIDO), the Department of Industrial Promotion (DIP), Department of Industrial Works (DIW), Thai Industrial Standards Institute (TISI), and Department of Alternative Energy Development and Efficiency (DEDE). The Global Environment Facility (GEF) funded project, "Industrial Energy Efficiency in Thailand," has helped C.P. Rice to implement an Energy Management System in alignment with ISO 50001 for an overall improvement in energy efficiency and a reduction in energy consumption.

A Case Study of Khao C.P. Company Limited

Structured Systems

In 2014 and 2015, C.P. Rice welcomed the opportunity to work with UNIDO to implement a structured management system aligned to the energy management standard, ISO 50001, which synergized well with the existing continuous improvement tools and systems such as TPM, LEAN and Quality management, and the externally certified ISO 9001 management system and ISO 14001 environmental management systems in place since 2004.

The ambitious target of certification to the internationally recognized and sought after ISO 50001 has been set for 2015 which C.P. Rice is expected to achieve.

Impressive 9.5% improvement in just 2 Years

Despite the plant being well designed and constructed, the management team has delivered significant improvements to the organization's performance through the use of diligent planning and investigations when carrying out the energy review with the support of the international and UNIDO-trained national experts.



Khao C.P. Company Limited (Wangdaeng Factory) (C.P. Rice), a rice refining plant located in Phra Nakorn Si Ayutthaya Province, provides Thai rice products for the Royal Umbrella Brand. With production capacity of 1,000 tons per day, the plant produces 25,000 tons of rice per month, 70% of which is consumed in Thailand. The company is focused on delivering a sustainable and environmentally friendly business with a key strategic focus on minimizing energy consumption. This fits well with the organization's vision to become the "kitchen of the world"

source: Schematic World Map,
UNIDO

The annual energy consumption efficiency index improved significantly **from 159 megajoules (MJ)/ton in 2011, to 145 MJ/ton in 2013**, representing a **9.5 % energy performance improvement**, and a **consequent reduction of 271 tons of CO2 emissions**.



Planning for Improvement

The energy management team of C.P. Rice has been delivering improvements for a number of years through an annual Plan-Do-Check-Act (PDCA) cycle. The formal review approach, aligned to ISO50001, brought international best practice and additional credibility to the process, guiding the company on how to best identify the significant energy users (SEUs) and Energy Performance Indicators (EnPIs) in order to plan and develop the most appropriate energy efficient methods.

The structured review identified 7 opportunities for improvement varying from immediate payback initiatives, such as:

changes to how the machines are loaded in the process

maintenance initiatives

capital investment opportunities with longer financial payback periods.

Power of Information

Data proved to be key to unlocking improvements in the facility; this was achieved through the use of mathematical modelling of the energy consumption of the significant energy users (SEUs) and predicting energy performance vs. baseline data. SEUs were identified;

Energy drivers were identified and analyzed;



Regression analysis was used to determine the best drivers;



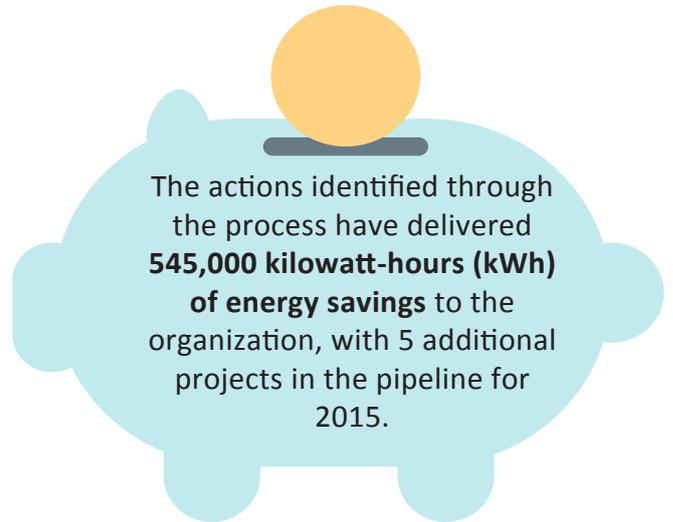
Trials were carried out on mathematical models to their appropriateness for C.P. Rice



The models proved very insightful and have now become an integral part of the plant's operations through ongoing performance monitoring of SEUs.

SMART Actions Delivering Savings to the Bottom Line

- Reduce the unloading time of the Polisher
- Reduce leakage in the air compression system
- Energy efficient air conditioning replacement
- Replace fluorescent lights with LEDs



Key Lessons



The UNIDO Industrial Energy Efficiency Project has provided a framework to support C.P. Rice to adopt a systematic approach to energy efficiency in its operations that is reasonable, verifiable and flexible.



Clear roles and responsibilities throughout the organization have led to a culture change where energy is everyone's responsibility, and is therefore, fully integrated into company strategy at various levels.



Adequate energy metering, data analysis and interrogation of the ongoing operation of existing plant performance are fundamental to effective energy management.

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