

"Project Formulation Survey" under the
Governmental Commission on the Projects
for ODA Overseas Economic Cooperation
in FY2013

Summary Report

Kingdom of Thailand
Project Formulation Survey of
Integrated Energy Efficiency Improvement
at Food and Beverage Factories

March, 2014

RENOVA, Inc

The content of this report is a summary of the project formulation survey, which was commissioned by the Ministry of Foreign Affairs of Japan in the FY 2013 and is carried out by RENOVA. It does not represent the official view of the Ministry of Foreign Affairs.

1. Description of the current situation and development needs of the concerned development issues in the surveyed country

1-1 Political and Economic Situation in Thailand

Thailand government has been actively issuing numerous investment incentive programs and policies for the foreign companies to promote investments from abroad. This has boosted the country's economic growth which helped the country recover from damages suffered during Lehman Brother's crisis in 2008 and two major floods that hit the country in 2011. For year 2014, the country's average GDP growth rate is expected to be around 4.0-5.0%, an increase from 3% in year 2013. However, recent political crises occurring since the end of 2013 is bringing up some concerns of possible delays in political decision makings against political issues.

1-2 Energy-Saving Challenges in Food and Beverage Industry

Thailand's economy is growing strongly as the industrialization progresses and the energy demand is increasing rapidly at an annual rate of 6%. To satisfy this increasing demand, Thailand imports 2% of its electricity consumption from the neighboring countries. 90% of the country's supplied electricity relies on fossil fuels. As a result, Thailand faces many issues such as strained electricity demand, increase of GHG emissions and depletions of natural resources.

Additionally, the electricity rate in Thailand is one of the highest among industrial countries in Southeast Asia. This may function as a deterrent for the country's economic growth. Due to these challenges, energy-saving is becoming an urgent issue in reducing Thailand's overall industrial energy cost.

1-3 Laws, Decrees, Policies and Related Plans

Since the issuance of Energy Conservation Promotion Act in 1992, Thailand government has issued various laws and decrees to promote and support energy-saving programs. Energy Conservation Promotion Act, "Strategic Plan for Energy Conservation (2002-2011)" submitted by the National Energy Policy Council in 2001 has become the base for establishment of Energy Conservation Promotion Fund (ENCON Fund) which is utilized to fund subsidy issuances, R&D support, pilot project support, etc. for the purpose of promoting energy efficiency and renewable energy.

1-4 Case Study of ODA Projects and Analysis of Other Donors

As an energy-saving ODA project of Japan, "Practical Energy Management Training Center Project" was conducted from 2002 to 2005. The purpose of this project was to educate and train the energy managers and their instructors as well as to provide support and capability building

required in operating “Practical Energy Management Training Center: PEMTC” organized under Ministry of Energy responsible for implementing qualification examination system targeted to energy managers.

During 2008 to 2011, PEMTC-established training program was also conducted in the ASEAN countries where the energy demand is increasing rapidly. The dissemination and application of the program’s good practices and results are much expected.

2. Possible applicability of the SME's products and technologies, and prospects for future business development

2-1 Strength of the Proposing Company and its Proposed Products and Technologies

The project proposer, RENOVA, Inc. (hereinafter “RENOVA”)’s engineering technologies provide systems to enable optimal use of energy throughout the whole production processes. The technologies are mainly targeted at food and beverage factories where the energy is largely consumed in the continuous heating or cooling processes. They are comprised of two elements, a software technology -- “energy consumption structure analysis simulator” and a hardware technology -- “multiple energy-saving equipment solution”.

Strong points and advantages of these technologies are listed below. These features meet the needs of Thailand which faces issues of slow progress in energy-saving activities and the rising energy cost.

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| <ol style="list-style-type: none">1. High energy-saving effect (energy cost reduction: maximum of 40%, average 20-40%)2. High cost performance (payback period 3-5 years)3. Competitor-free (limited energy-saving activities in the developing countries)4. Difficult to imitate (based on knowledge and skills achieved through experiences, unlikely to get involved in price competition)5. Environmentally friendly (GHG/air pollutant emission reduction by substantially reducing consumptions of fossil fuels, saving water by reuse of waste heat and steam, efficient odor suppressing effect by reducing waste heat and steam discharged outside the process) |
|--|

2-2 Foreign Market Entry and Positioning of RENOVA’s Project Implementation

RENOVA has been actively promoting energy projects recently both in Japan and overseas. RENOVA believes the experiences and the technologies provided in these projects can also be utilized in Southeast Asia where a mitigation of growing energy demand has become a social challenge.

Companies in Thailand to which the energy-saving project was proposed in the preparation

survey indicated strong interests. More specific discussions are taking place with several of these companies. Additionally, Department of Alternative Energy Development and Efficiency (DEDE) under the Ministry of Energy, which promotes energy-saving policies in Thailand, is showing an interest in the proposed technologies. A cooperative relationship has been built with DEDE to achieve some support from in the future business development in Thailand. Meanwhile, RENOVA is also discussing with multiple Thailand counterpart companies including leasing companies and ESCO companies for tie-ups.

Through the preparation survey in Thailand, the needs for RENOVA's technologies have been confirmed and a system building for project implementations is in progress.

2-3 Contribution to Japan's Regional Economy by RENOVA's Foreign Market Entry

RENOVA's engineering technologies maximize energy-saving effect in the overall production processes. The proposed energy-saving equipment will be installed after RENOVA conducts engineering consulting. Thailand has about 6500 food and beverage factories and the market size is estimated to be approximately JPY 900 billion. The market is quite attractive, given the fact that energy-saving activities are not conducted in most of these factories.

Out of the technologies RENOVA proposes, energy-saving equipment with core technologies of the project are products made by Japanese manufacturers. By accelerating these companies and their related firms/suppliers' entry into foreign market through the project, a contribution could be made in stimulating Japan's regional economy

2-4 Project Structure

The project will be carried out in cooperation with an engineering company, a construction company, a leasing company and a financial institution. RENOVA will conduct simulations and design while the engineering company and the construction company will procure and install equipment based on its design. RENOVA will then be recompensated for its engineering services.

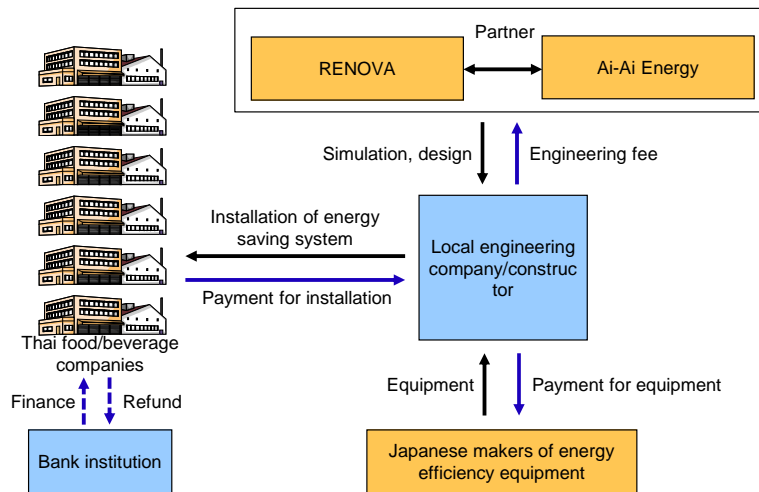


Figure. Project scheme

2-5 Project Implementation System and Project Dissemination Plan

Project implementation system is shown in the figure above.

In order to disseminate the project, promotion of project technologies' understanding and capability building of local technicians is indispensable. Therefore, the energy-saving effect will be highlighted through the first implementation of the project conducted at a company that indicates strong interest. Also, a public and private sector working group will be set up as an ODA project and a case study will be conducted with the first project implementation as the business model. Through these activities, a basic will be built for dissemination of RENOVA's energy-saving technologies, aiming to establish a business structure for future multiple order opportunities by year 2015.

2-6 Risk Measures

Legal, intellectual property and environmental and social risks are expected in the implementation of the project. However, risks that require urgent actions are not observed at this point in time.

3. Verification of adaptability of the SME's products and technologies to the surveyed country (Demonstration and pilot survey)

3-1 Overview

A total of 13 food and beverage factories had been visited. For the three companies which showed strong interest, multiple proposals were made after accurately understanding their current production processes.

Energy-saving seminars were conducted on-site and a total of 27 members had participated according to the result of this survey.

3-2 Result

For the three food and beverage companies in Thailand, energy structure analysis and multiple energy-saving solutions such as implementation of heat recovery and energy-efficient equipment were proposed. All of the proposed energy-saving technologies in this project have a payback period of 3 years or less and deemed to have economic rationality. Additionally, 20-30% cost reduction could be expected in overall energy cost.

3-3 Profitability Review

RENOVA's business model for this project includes earnings achieved through providing energy-saving simulations and system designing services for Thailand's food and beverage factories. Each payment for the engineering services would differ in amount depending on the project size but around JPY10million is expected to be earned. The main expenditure associated with conducting the engineering services will be the labor cost. By taking into consideration the time that was required in the past on similar surveys, profitability for the labor cost could be secured.

4. Expected development impact and effect on business development of the proposing SME in the surveyed country through proposed ODA projects

4-1 Conformity of Proposed Products/Technologies to Thailand's Development Challenges

The proposed technologies are technologies expected to mitigate strained electricity demand, to strengthen industrial competitiveness by reducing energy cost and to have environmental improvement effect. They also need to conform to Thailand's development challenges stated in above 1-2.

4-2 Effect on Development by Application/Utilization/Dissemination of Products/Technologies in Thailand through ODA-Funded Project

The proposed technologies are technologies which can reduce consumptions of fossil fuels and electricity drastically by rationalization of energy usage through the whole production processes while reducing air pollutants, waste water, odor and GHG emissions.

4-3 Effect on RENOVA's Project Development by ODA Project Implementation

Size of the market for engineering services provided to Thailand's food and beverage

companies is quite big -- approximately JPY65billion. Starting with companies whose needs have been confirmed through this survey, RENOVA hopes to actively expand the business and to proceed with project implementations.

In disseminating the energy-saving project, it is critical that the companies have full understanding of its advantages so that an appropriate investment decision could be made. Since the project technologies are new in Thailand, spread of recognition is also important. By discussing and conducting dissemination development measures in coordination with Thailand governmental organizations as ODA project, increase of energy-saving project recognition could be expected.

5. Proposals for formulating ODA projects

5-1 Overview

As stated above, the comprehensive optimal energy-saving systems for production processes of food and beverage factories contain technologies of which Thailand hardly has any implementation experiences. The dissemination of these technologies will require the stakeholders' recognition and promotion of technical understandings. The energy managers of food and beverage companies as well as the engineering company need to deepen their understandings of the technologies. Meanwhile, energy-saving effects need to be proven at factories where actual equipment is installed and these effects need to be widely disseminated. By coordinating with the equipment-installed model factories, capability-building of energy-saving technicians will be conducted as part of the ODA project

5-2 Cooperation Activities and Development Effect

Capability-building program will be conducted as an ODA project to develop human resources with energy-saving knowledge and skills at food and beverage factories. The scheme of the program is indicated in the figure below. This ODA project is based on the premise that cooperation is achieved from energy-saving equipment installed model factories.

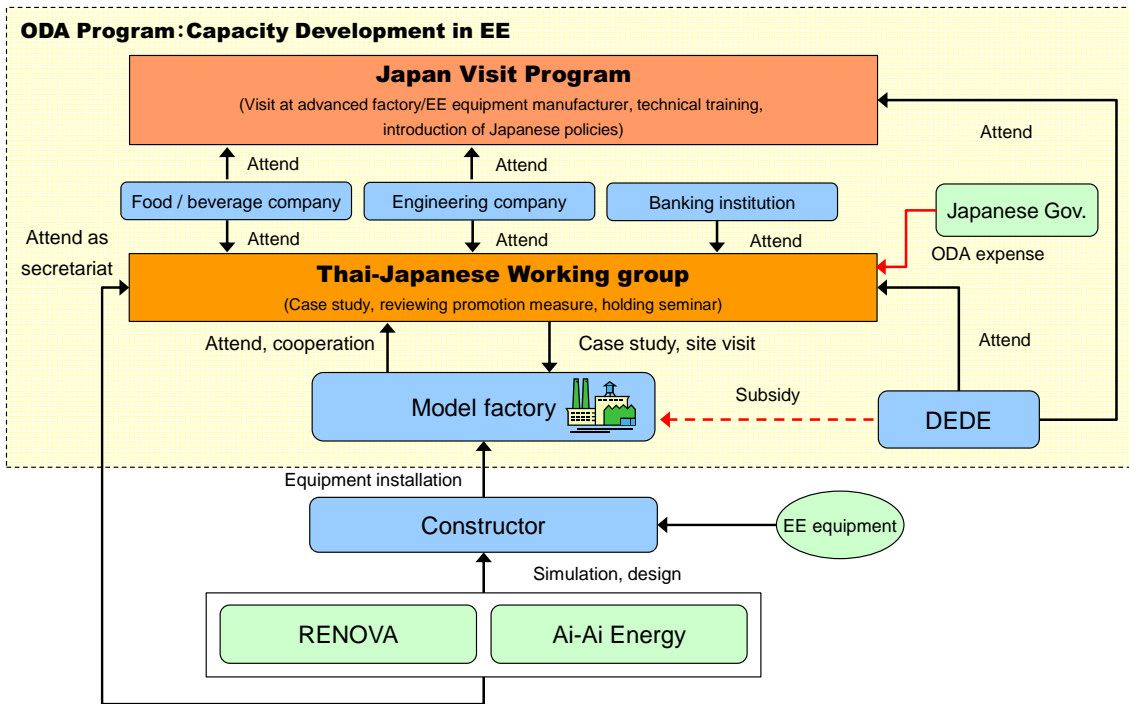


Figure. ODA Project Scheme

In the proposed ODA project, workshops on-site in Thailand for public and private sectors and a tour to Japan inviting members from Thailand will be conducted.

In the workshops for public and private sectors, working groups comprised of DEDE, model factories, food and beverage companies, engineering companies, financial institutions, etc. will be organized and conferences, on-site tours and energy-saving and dissemination seminars will be held. These activities will enable stakeholders to deepen their understanding of energy-saving systems and will promote dissemination and expansion in Thailand.

In Japan itself, members of the working groups in Thailand previously mentioned will be invited to Japan for a tour to visit factories installed with advanced energy-saving systems and some energy-saving manufacturer as well as to receive a coaching in energy-saving technologies. Through this activity, capability building of the technicians will be conducted. The activity will also help them to understand which food and beverage companies are motivated in energy-savings, which is important in investment decision making.

5-3 Other Cooperation Possibilities

In implementing the above ODA project, cooperation with energy-saving technicians training organization PEMTC could be considered. PEMTC provides energy-saving technical coaching for individual industrial equipment but has no programs on energy-savings in overall production processes. Therefore, by having PEMTC engineers participate as a member in the public and

private sector workshops, their knowledge and skills achieved in the workshops could be reflected in the PEMTC training programs for reinforcement of the PEMTC functions.

5-4 Other Related Information

We have explained the above ODA scheme to the Department of Energy Efficiency of DEDE which is supposed to be a counterpart, and obtained its agreement on our proposal.

The Department of Energy Efficiency believes On the Job Training is important, and showed the idea that it is effective to have the training program with case studies of concrete implementation site as our proposal.

