

JCM contributions to SDGs

- **Best practices** -

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Aug/25/2021

Cambodia: High-Efficiency LED Streetlights Using Wireless Network

Project background information:

- Part of Cambodia’s smart city project (improving urban environment and quality of life of citizens)
- Advanced multi-use technology required for future activities

Project overview:

- Introduction of 5,672 high-efficiency LED (light-emitting diodes) streetlights using wireless network through the JCM (total of 7,989 LED streetlights installed for the smart city project)
- Expected GHG emissions reduction: 508 t-CO₂eq/year (average)



The Introduced wireless LED streetlights have improved road safety, which leads to prevent road traffic accidents.



Partner company in Japan provides Minebea (Cambodia) Co., Ltd with regular training seminars on operation and maintenance of equipment as well as on monitoring of GHG emissions.



LED streetlights with wireless dimming control have reduced electricity consumption and GHG emissions, compared to conventional HID (high-intensity discharge) lighting.



Sustainable transportation system and road safety devices help provide a safe and affordable transportation system for local people, promoting sustainable urban development. Wireless network technology can also be utilised in the future for other applications, such as parking sensors.



The project was awarded “Cambodia’s Minister of Environment Prize”. Through experience of the JCM, the Japanese partner company started its own business to establish a smart city project in Cambodia without the need for subsidies. Participating in JCM and collaborating with different stakeholders ensure the diffusion of low-carbon and decarbonisation technologies, and improve the partnership between the government and private sector in both countries.

Bangladesh: PV-diesel Hybrid System

Project background information:

- Factory required to be more environment friendly, and as contribution towards lowering carbon emissions
- Support for sustainable manufacturing business

Project overview:

- Introduction of 340kW PV system and fuel save controller
- Expected GHG emissions reduction: 203 t-CO₂eq/year (average)



Generating electricity using a hybrid system reduces diesel consumption by 75,056 litres per year, and contributes to air pollution reduction, thereby reducing per capita negative environmental impacts.



Japanese company provides vocational training on operation, maintenance and cleaning in the dry season to YKK Bangladesh employees, who are responsible for the operation and maintenance of the technology.



258,780 kWh of electricity is produced per year. Bangladesh is one of the most disaster-prone areas of the world, experiencing frequent cyclones and storms. The installed system is designed to be climate-resilient: PV modules can withstand heavy wind, hail storms and cyclones, and the controller can automatically restore power when a storm hits.



Strengthening technological upgrades would support Bangladesh's transition to sustainable production while increasing sustainability of the production.



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Myanmar: Waste-to-Energy Project

Project background information:

- Landfill capacity at the current treatment site is decreasing
- Negative impacts on environment (human health) due to poor waste management

Project overview:

- Introduction of advanced solid waste treatment
- Expected GHG emissions reduction: 4,067 t-CO₂eq/year (average)



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|   | <p>Generating electricity from solid waste leads to reduce fossil fuel consumption and contributes to air pollution reduction. Treating solid waste can contribute to soil contamination reduction in the surrounding area. Therefore, the project reduces negative environmental impacts by improving waste management.</p> |
|  | <p>JFE Engineering Corporation provides technical capacity training for local engineers and employees to operate the treatment plant.</p> |
|  | <p>Engaging in advanced waste management and reducing hazards from solid waste can prevent ground water pollution. The project can reduce the volume of solid waste by around 90%.</p> |
|   | <p>The project reduces GHG emissions by replacing electricity generated by fossil fuel and avoiding methane release from the solid waste. Over 60 % of generated electricity is used by the treatment plant itself, and the rest is sold to the grid system.</p> |
|   | <p>Introducing high-efficiency technologies in solid waste treatment leads to enhance sustainable public infrastructure development. The plant treats about 60 tonnes of waste per day. It has a separate recycling process which collects recyclable materials such as bottles and plastics. These activities contribute to reducing the landfill waste. Strengthening this kind of technological upgrade would help Myanmar to move towards more sustainable production.</p> |
|  | <p>Contributing to marine pollution reduction through appropriate solid waste management.</p> |
|  | <p>Participating in JCM and collaborating with different stakeholders ensure the diffusion of low-carbon and decarbonisation technologies and improve the partnership between the government and private sector in both countries.</p> |

Palau: Rooftop Solar Power Plant

Project background information:

- Imported diesel is used to generate electricity; therefore, electricity prices are high
- Generating the electricity from solar PV reduces the utility cost at the facility

Project overview:

- Installation of 370.5kW rooftop solar PV on the commercial facility
- Expected GHG emissions reduction: 227 t-CO₂eq/year (average)



Generating electricity by solar PV reduces diesel consumption and contributes to air pollution reduction which reduces the negative environmental impacts per capita.



Technical training sessions were provided for local employees on how to operate and control the solar power generation equipment, using a manual on how to monitor the power generation. In addition, Pacific Consultant Co., Ltd shared a manual for the solar PV power generation management.



Generated electricity is used by the facility itself (100%) and if electricity is over generated, it is sold to the grid. Overall, the project generated about 500 MWh electricity a year which means this amount of electricity is replaced by purchasing electricity from the grid system. Palau is an island country, so rising sea levels can threaten livelihoods. In this regard, increasing the share of RE electricity is an important approach to contribute to climate change mitigation. The solar cells in panels and joints between solar panels and gantry were designed to be resilient under high wind pressure conditions since Palau has many large-scale typhoons throughout year. Therefore, this solar PV is resilient to climate change disasters such as typhoons.



Introducing solar PV technology would strengthen the country's technological upgrade in the energy sector and it would help Palau to develop more sustainable and resilient energy infrastructure. Also, building RE projects would improve the country's transition to more sustainable consumption.



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Saudi Arabia: High-Efficiency Equipment in Chlorine Production

Project background information:

- Need for enhanced sustainable industrialisation and innovation
- Previous good business relationship before the JCM project development

Project overview:

- Introduction of high-efficiency ion exchange membrane in a chlorine production factory
- Expected GHG emissions reduction: 2,740 t-CO₂eq/year (average)



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| | <p>Providing capacity training for local engineers to operate the factory equipment. The manufacturer also reviews the data from the local factory to check its operation.</p> |
| | <p>Increasing energy efficiency by introducing latest high efficiency model of electrolyzes in the factory can contribute to reducing CO₂ emissions.</p> |
| | <p>Introducing advanced low-carbon technology can support the country's development of sustainable industry and innovation. Strengthening this type of technological upgrade would help transition to more sustainable production and improve the working environment.</p> |
| | <p>Participating in JCM and collaborating with different stakeholders ensure the diffusion of low-carbon and decarbonisation technologies and improve the partnership between the government and private sector in both countries. The financial and technical support has successfully involved multi-stakeholders in project development and operation.</p> |

Kenya: Solar PV System at a Salt Factory

Project background information:

- Electricity prices for manufacturing are high
- Power outages often occur in rural areas

Project overview:

- Installation of a high-quality 991.1kW solar PV system as an alternative power source
- Expected GHG emissions reduction: 630 t-CO₂eq/year (average)



The reduction in the amount of electricity purchased from electric power companies has led to a reduction in the cost of electricity usage in the factory. This makes it possible to manufacture and sell salt at a more affordable price.



Reducing fossil fuel consumption contributes to reduced air pollution. Reducing the environmental burden by improving air pollution can improve the per capita environmental impact of cities.



Vocational training on how to operate the solar PV power generation facilities was conducted for engineers at the salt factory. Pacific Consultant Co., Ltd developed and shared a monitoring manual for local employees.



20%-30% of the total annual electricity consumption at the factory is covered by electricity generated from the solar PV power generation system. The project received the Best New Subscriber Award at the Energy Management Awards in Kenya in 2019.



The use of renewable energy reduces grid power consumption and supports Kenya's transition to sustainable production while increasing sustainability of the production.



Participating in JCM and collaborating with different stakeholders ensure the diffusion of low-carbon and decarbonisation technologies and improve the partnership between the government and private sector in both countries. From project planning to implementation, project participants maintain close communication with local governments and communities.

Mongolia: Solar Power Plant in Farm

Project background information:

- Need to increase production of fresh vegetables and practice sustainable food production
- Severe air pollution in winter season due to use of coal

Project overview:

- 12.7MW solar power plant installed at farm in suburbs of Ulaanbaatar city
- Expected GHGs emissions reduction : 11,223 t-CO₂eq/year (average)



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|  | <p>In 2019, 27 tons of high quality, fresh vegetables were produced and delivered to the residents of Ulaanbaatar. The revenue from the solar PV project provided support to the company to increase investment for installing Japanese agricultural technologies.</p> |
|   | <p>Generating electricity by solar PV leads to less fossil fuel consumption which contributes to air pollution reduction and improves negative impacts on the environment.</p> |
|  | <p>Farmdo Co., Ltd provides training sessions for the local farmers to improve their agricultural skills for working on the solar farm®. In addition, engineers and workers in solar PV power generation carry out work under guidance provided online from the manufacturer.</p> |
|   | <p>Since operations started in 2017, total electricity production reached about 40,000 MWh and the amount of electricity sold is about 38,000 MWh (as of 31 Dec 2019). The electricity generated from the solar PV is sold to the national grid which contributes to increase the share of renewables in electricity in the country, thereby reducing CO₂ emissions.</p> |
|   | <p>Building sustainable infrastructure in Mongolia's energy sector and strengthening the country's technological upgrade in the largest emitting sector would help the country to move towards more sustainable production.</p> |
|  | <p>Participating in JCM and collaborating with different stakeholders ensure the diffusion of low-carbon and decarbonisation technologies and improve the partnership between the government and private sector in both countries.</p> |

Viet Nam: Energy-Efficient Water Pump

Project background information:

- Da Nang City needs to expand water supply due to rapid urbanisation and population growth
- Yokohama City and Da Nang City have been promoting technical cooperation on infrastructure development through “City-to-City Cooperation”

Project overview:

- High-efficiency water pump installed in the treatment plant in Da-Nang city.
- Expected GHG emissions reduction: 599 t-CO₂eq/year (average)



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| | <p>Providing technical training sessions by Yokohama Water Co., Ltd for local project participants for maintenance, operation and monitoring in order to operate the project properly.</p> |
| | <p>The installed high-efficiency water pump contributed to increasing the water supply by 5,000 tonnes per a day. The local company supplies 70% of the water consumed in Da-Nang. This project achieved a supply stable and ensured higher quality water for the city.</p> |
| | <p>Energy efficiency increased by 20% leading to reductions in CO₂ emissions as well as lower electricity cost at the water treatment facility.</p> |
| | <p>Installation of a highly efficient water pump resulted in a sustainable water supply to the Da Nang City residents. This project provides financial and technical support for sustainable infrastructure development in Viet Nam. Moreover, the new equipment is much quieter which has improved the working environment.</p> |
| | <p>Participating in JCM and collaborating with different stakeholders ensure the diffusion of low-carbon and decarbonisation technologies, and improve the partnership between the government and private sector in both countries.</p> |

Indonesia: Energy-Efficient Used Paper Processing System

Project background information:

- Need to support sustainable manufacturing businesses
- Previous good business relationship before JCM project development

Project overview:

- Installation of energy-efficient used cardboard processing system into a packaging paper factory
- Expected GHG emissions reduction: 17,822 t-CO₂eq/year (average)



The Japanese manufacturer provides local employees with technical capacity training on maintenance following installation of the processing technology.



Energy efficiency is increased by 10% leading to reductions in CO₂ emissions as well as lower electricity cost at the treatment facility.



The factory recycles used cardboard boxes to produce new paper boxes. The amount of waste paper processed in one day increased from 3,200 tons to 4,200 tons compared to the old technology. Supporting this Indonesian technological upgrade would help to move toward more sustainable production. The project allows adoption of environmentally sound technologies (EST) in industrial processes which fosters innovation.



Participating in JCM and collaborating with different stakeholders ensure the diffusion of low-carbon and decarbonisation technologies, and improve the partnership between the government and private sector in both countries. For the local company, there is an increased opportunity to participate in JCM related seminars and events in Indonesia.

Bangladesh: High-Efficiency Air-jet Looms

Project background information:

- Technical upgrade and low carbonisation are needed in one of Bangladesh’s main industries — textiles
- Previous good business relationship before the JCM project development

Project overview:

- Installation of high-efficiency air-jet looms in a weaving factory
- Expected GHG emissions reduction: 382 t-CO₂eq/year (average)



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| | <p>Capacity training for local factory employees on how to operate and monitor the project.</p> |
| | <p>Installation of high efficiency air-jet looms can reduce CO₂ emissions and lower electricity consumption in the factory due to increased energy efficiency.</p> |
| | <p>Technical upgrading in this labour-intensive sector can promote sustainable industrialization and improve the working environment in the textile factory by reducing noise stress.</p> |
| | <p>Installing advanced technology in Bangladesh encourages industry innovation and improves the use of natural resource, resulting in the country transitioning to sustainable production.</p> |
| | <p>Participating in JCM and collaborating with different stakeholders ensure the diffusion of low-carbon and decarbonisation technologies and improve the partnership between the government and private sector in both countries. There were increased opportunities for the government and other private sector entities to actively engage in dialogue and share information.</p> |

Reference

- Joint Crediting Mechanism (JCM) contributions to Sustainable Development Goals (SDGs)
<https://www.iges.or.jp/en/pub/joint-crediting-mechanism-jcm-contributions-sustainable-development-goals-sdgs/en>
- Joint Crediting Mechanism (JCM) and Sustainable Development Goals (SDGs) Linkage Guidance
<https://www.iges.or.jp/en/pub/jcm-and-sdgs-linkage-guidance/en>

History

| Date | Description |
|-----------------|---|
| August/25/2021 | Added two case studies from Cambodia and Bangladesh |
| February/1/2021 | Added four case studies from Myanmar, Palau, Saudi Arabia, Kenya |
| March/2020 | Developed four case studies from Mongolia, Viet Nam, Indonesia and Bangladesh |