Maynilad Water Services, Inc.

Optimizing energy consumption for a more efficient, prudent and sustainable business operation necessary in meeting the needs of its growing customer base through ISO 50001:2018 implementation.

Maynilad Water Services, Inc Head Office in Metro Manila, Philippines

Case Study Snapshot	
Industry	Utility
Product/Service	Water and Wastewater
Location	Philippines (Metro Manila)
Energy performance improvement percentage (over the improvement period)	3.59% improvement over 5 years (site #1-7) 1.35% improvement over 3 years (site #8) 2% improvement over 2 years (site #9) 5.09% improvement over 2 years (site #10)
Total energy cost savings (over the improvement period)	USD 1,698,413 (5 years)
Cost to implement Energy Management System (EnMS)	USD 153,729 (5 years)
Total energy savings (over the improvement period)	53,401 GJ (5 years)
Total CO_2-e emission reduction (over the improvement period)	10,513.00 Metric Tons (5 years)

Organization Profile / Business Case

Maynilad Water Services, Inc. (Maynilad), an agent and franchisee of the Metropolitan Waterworks and Sewerage System (MWSS), is the largest private water concessionaire in the Philippines in terms of customer base with 9.9 million customers. Maynilad provides water and wastewater services to 17 cities and municipalities that comprise the West Zone of the Greater Manila area. To serve these many customers in those areas, Maynilad operates several water treatment plants, pump stations, reservoir, sewage and septage treatment plants, and lift stations. As Maynilad continuously expands its service delivery, it is inevitable that its energy consumption will also increase. Hence, Maynilad adopts sustainability strategies in its operations to minimize its impact. One of these strategies is the implementation of the energy management system which enables the company to be more energy efficient in its operations without compromising the level of service given to its customers. The energy management system of the company also supports its goal of becoming a Climate Neutral company by 2037. Being a climate neutral company supports Maynilad's mission of providing safe, affordable and sustainable water solutions to its customers.

The implemented energy management system of the company is based on ISO 50001:2018 which serves as the framework for a more structured monitoring of the company's energy utilization and performance. Maynilad was re-certified for ISO 50001:2018 last July 2021 for the following facilities:

1. La Mesa Treatment Plant 1
2. La Mesa Treatment Plant 2
3. La Mesa Pump Station
4. Villamor Pump Station
5. Pagcor Pump Station
6. Pasay Pump Station
7. Tondo Sewage Pumping Plant
8. Maynilad Head Office
9. Putatan Water Treatment Plant 1
10. Putatan Water Treatment Plant 2

"Reducing our energy consumption is not easy, given our constantly expanding service coverage. But by reviewing our processes and improving certain practices, we managed to further reduce energy use without compromising our production levels"
—Ramoncito S. Fernandez, President and CEO

Business Benefits

The ISO 50001:2018 re-certification signifies the commitment of Maynilad for continual improvement of the energy management system within the company, aligned to its target of achieving Climate Neutrality by 2037. The company sees this as a significant step to reduce carbon footprint which is one of its priorities as a company that depends on natural resources for business sustainability.

Since its first certification in 2017, Maynilad was able to save 53,401 GJ of energy for a 5-year energy performance period (2017-2021) aggregated for the 10 facilities. This is equivalent to 14,834,669.65 KWH savings in energy consumption over a period of 5 years. In 2021 alone, more than 4.3 million KWH was saved by the 10 EnMS sites. The reduction has led to the company saving $USD 492,393 from payment of purchased electricity. This, while also reducing the impact to the environment by reducing the CO2 emissions by 3,053 metric tons CO2e and spending only $USD 153,729 for the implementation of EnMS over the 5-year period. (equivalent to 0.0905 years payback period).

The energization of the Maynilad Solar Power Farm in May 2021 not only resulted to a savings of 139,806-kilowatt hour of purchased electricity, it also resulted to a carbon avoidance of 99.1 tCO2e and estimated cost savings of $USD 7,442.

Other benefits of the EnMS implementation include more efficient operations, enhanced employee satisfaction and productivity, and improved company image.

Plan

From the first Energy Management certification in 2017 up to 2020, Maynilad has already saved more than 10 million kilowatt hours of purchased electricity, equivalent to $USD 1,698,413. This would not be possible without the support of the top decision makers of Maynilad as this is a management-driven program. Due to the evident effectiveness of the management system in the past 4 years, the President and CEO of the company impelled the other members of the Top Management to encourage their teams to come up with more energy efficiency and conservation measures as part of their efforts to reduce operational expenses. This being a management-driven program, approvals for the needed finances and other resources to implement the various energy efficiency and conservation projects are easier to obtain.

Table 1. *2021 Savings from Implementation of EnMS*

Total Savings in kWH for the 10 sites	4,307,945.70 KWH
Total Energy Cost Savings	$USD 492,393.45
Cost to implement Energy Management System (EnMS)	$USD 18,729
Total energy savings	15,5067.36 GJ
Total CO2e emission reduction	3,053 Metric Tons

Note: *Calculations provided in the Entry Form*

It is often said that we cannot manage what we do not measure, and if we cannot measure, then we cannot improve. This holds true in Energy Management, as it is data driven. Data gathered from the baseline year 2016 were analyzed to come up with data-driven decisions to improve overall energy performance. The process of understanding the energy consumption of the 10 SEUs includes raw data interpretation, results of which are investigated to find interrelationship of variables that will help in identifying bottlenecks, formulating hypothesis and solutions.

Results of the past years' performance analysis allow the Maynilad Energy Management team to see and analyze possible future trends and potential issues. Understanding of these trends allow us to develop preventive measures and practical energy management strategies.

To ensure that EnMS would support the strategy and targets of the organization, energy management projects are aligned with the following sustainability pillars—business growth, operational efficiency, and organizational capability.

Certificate

Standard ISO 50001:2018

Certificate Registr. No. 01 407 127015

Certificate Holder:

Maynilad

Maynilad Water Services, Inc.
MWSS Complex, Katipunan Avenue, Balara, 1119 Quezon City, Philippines

Including the locations according to annex

Scope: Provision of Water and Wastewater Services

Proof has been furnished by means of an audit that the requirements of ISO 50001:2018 are met.

Validity: The certificate is valid from 2021-07-31 until 2024-07-30.
First certification 2016

2021-07-29

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Figure 1. *ISO 50001:2018 Re-certification of the 10 Sites*

Compared to its initial certification in 2016 wherein everything about the Company's Energy Management System was literally started from scratch—from the initial stage of looking for a consultant, training of the first set of EnMS Core Team, Energy Managers and Energy Conservation Officers, identification of energy using equipment, to the initial data gathering to come up with the baseline data—the re-certification process is easier as the EnMS is already in place, as focus is more on the implementation of the energy efficiency and conservation projects, apart from the identification of areas for improvement and best practices in the management system. This includes compliance to legal and other requirements such as the new regulations of the Department of Energy, and revision of procedure on Energy Review. Since Maynilad is a multi-site company, a team/department was designated to oversee the implementation and performance of all the sites/facilities. This department is also the one responsible for updating the guidelines and procedures for the implementation of the energy management system.

"Our recertification to ISO 50001:2018 strengthens our drive to continue improving the implementation of our EnMS towards achieving our Climate Neutrality Target by 2037."
—John Emmanuel B. Martinez, Sustainability Department Head

Do, Check, and Act

After the energy management was established, a core team was formed composed of key personnel from the 10 sites covered. Members of the core team were gathered thru meetings to cascade new directions for the management system and to update/assess their current performance with regards to the implemented programs of the management system. The members of the core team will then relay the information cascaded to their respective teams on-site to be able to align all personnel of the facilities with the goals of the management system.

The Top Management gives their support by being the main drivers of the energy management system. They appreciate every small effort done, like the operation optimization of the booster pumps, towards being a more energy efficient company.

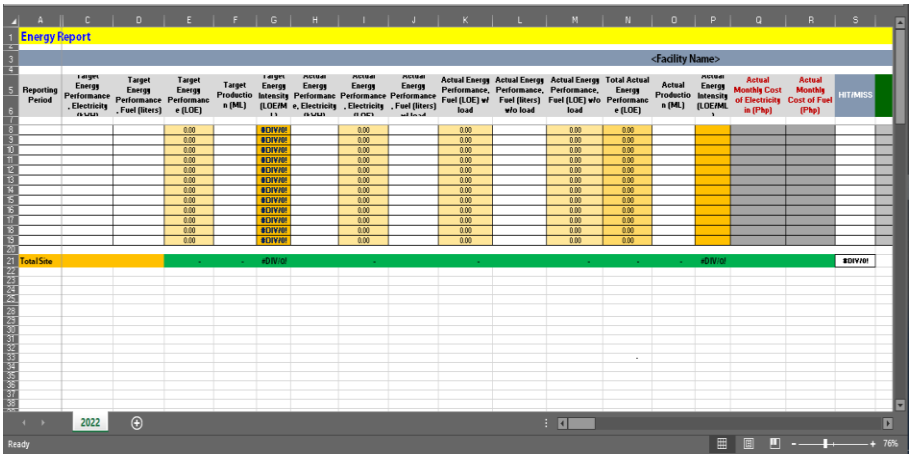

Figure 2. *Screenshot of the monthly Energy Report template*

Every month, each of the 10 facilities submits an energy report which includes their energy performance in terms of energy intensity for the month and their set targets. Energy Intensity is measured in terms of Energy from Electricity (KWH) and Fuel (liters) consumption converted into a common unit which is Liters of Oil Equivalent (LOE) divided by the volume of total water production and total waste water treated in million liters (ML). To get the LOE values, we used the Department of Energy's conversion factors. Through the report, it can be assessed whether the facility hits their targets or if there is need to adjust some operation protocol to ensure continued improvement in their energy performance. At the end of each year, the overall energy performance of the facility was compared to the baseline data to determine the level of the energy performance improvement and what other steps are needed to be taken to further improve its energy performance.

Table 2. *Energy Performance by Facility*

	Energy Intensity (in KWH/ML)					
Site # 1 to 7	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
La Mesa TP 1	4.73	4.51	4.39	4.39	4.13	3.21
La Mesa TP 2	4.03	3.67	3.77	5.06	3.82	3.64
La Mesa PS	145	141	139	140	140	138
Villamor PS	192	201	209	211	214	227
PAGCOR PS	161	157	141	137	143	150
Pasay PS	124	106	124	122	123	128
Tondo SPP	53	54	47	46	45	67
Aggregate Intensity	**55.0**	**52.5**	**53.5**	**53.3**	**52.9**	**52.85**
Improvement against 2016	**Base year**	**4.47%**	**2.66%**	**3.10%**	**3.82%**	**3.90%**
5-year Average Improvement		**3.59%**				

	Energy Intensity (in KWH/PAX)			
Site # 8	**2018**	**2019**	**2020**	**2021**
Head Office	124	129	113	126
Improvement against 2018	**Base year.**	**-3.65%**	**8.89%**	**-1.19%**
3-year Ave. Improvement	**1.35%**			

	Energy Intensity (in KWH/ML)		
Site # 9	**2019**	**2020**	**2021**
Putatan WTP 1	320.61	323.99	305.24
Improvement against 2019	**Base Year**	**-1.05%**	**4.79%**
2-year Ave. Improvement	**2.00%**		

	Energy Intensity (in KWH/ML)		
Site # 10	**2019**	**2020**	**2021**
Putatan WTP 2	384.69	369.43	360.80
Improvement against 2019	**Base Year**	**3.97%**	**6.21%**
2-year Ave. Improvement	**5.09%**		

Specially for the water treatment plants, energy consumption is greatly affected by the changes in the environment conditions. These changes affect the quality of the raw water being treated for potable supply. Some conditions require more extensive treatment processes which in turn requires the consumption of more energy.

Figure 3. *Photos taken during the audit of the Energy Management System conducted by TUV Rheinland*

To verify the effectiveness of the implementation of the energy management system, audits are being conducted. During the audits, energy data and level of compliance to the management system are checked as well as opportunities for the continual improvement of the implementation of the management system. This ensures that implementation of the energy management system is still suitable, adequate and always improving.

Transparency

Official press releases, in newspapers, company news letters and corporate website is the company's way of publicly announcing its certification for ISO 50001:2018. Information regarding the energy management system are also disclosed through the annual and sustainability reports. For CDP, SASB and other ESG reporting, disclosures are made through the parent company Metro Pacific Investments Corporation.

What We Can Do Differently

- Maynilad should have established a documented Energy Plan in the early stages of the management system to standardize the needed activities/programs and have a guide on the implementation of the management system.

Next steps and future plans:

1. Consistent implementation for continual improvements
2. Strengthen the mindset for energy efficiency in the company
3. Expand the scope of the Energy Management System
4. Invest more on renewable energy sources/opportunities
5. Gradually shift to the use of e-vehicles