

Global Energy Management System Implementation: Case Study

INDONESIA

PT.APAC INTI CORPORA

confident to stay competitive in a tougher global textile competition.

“Save Energy – Stay Competitive - Save Life”
—Stanley Sutrisno, MR—



High Efficient Compressor

Include caption

Business Benefits Achieved

PT Apac Inti Corpora had been conducting energy conservation programs since 2006. In early 2013, PT Apac Inti Corpora started to implementing global energy management system of EnMS-ISO 50001:2011 where certification was received in June 2014.

Since the implementation of these conservation programs, we have reaped rich benefits in term of cost, culture, quality, productivity, safety, moral and business efficiency. In terms of electricity saving, Rupiahs, and CO₂, respectively PT. APAC INTI CORPORA have been able to reduce energy consumption by about 136.693,5 MWH = Rp. 111,2 Billion. = 97.052,3 tons of CO₂. With Energy Management Systems that are continuously improved, PT. APAC INTI CORPORA become more

Case Study Snapshot

Industry	PT. Apac Inti Corpora
Location	Central Java, Indonesia
Energy Management System	ISO 50001:2011
Product/Service	Yarn, Greige and Denim
Energy Performance Improvement (%)	13.52%
Annual energy cost savings	318.752 USD
Cost to implement	339.782 USD
Payback period	1.1 Year

Company (or Facility) Profile

PT. APAC INTI CORPORA is located on a strategic and advantageous place in Central Java-Indonesia. It is an ideal location called Bawen at Semarang city that can assemble intensive labors for 7.000 local people. Powered by computerized system, sophisticated and integrated machinery, PT Apac Inti Corpora widely produces 3 key products:

1. Yarn;
2. Greige Fabric , and;
3. Denim Fabric.

PT Apac Inti Corpora deliver 70% of its massive & world class quality products to international market, to over 70 countries in 5 continents in the world, and 30 % to domestic market. We offer the best quality, competitive price and on time delivery service.

Strong commitment to quality, environmental and energy performance lead PT APAC INTI CORPORA to achieve certification of QMS-ISO 9001:2008 (Quality and Customers Satisfaction) and EnMS-ISO 50001: 2011 (Energy Management System) from TUV SUD PSB as well as EMS-ISO 14001:2004 (Environmental Management System) from SAI-Global Certification Body, since all activities in PT APAC INTI CORPORA are seriously monitored and controlled following the International standards.

With the energy costs sky rocketing and overhead costs escalating emphasis has been given for overall reduction in power consumption. Our focus is on Energy conservation without impairing productivity and quality. To survive in this industry we have to be highly competitive without compromise. Productivity and quality cannot be compromised while to stay competitive the only way is to conserve energy.

Business Case for Energy Management

Energy conservation programs had been conducted by PT. Apac Inti Corpora since 2006. When the world crisis occurred in 2008, export markets greatly decline resulting in total production also declined. As a result of the downturn, the energy cost becomes very high. Therefore, top management set a target to decrease any costs including energy costs.

Before the management system of energy released, PT AIC already established saving energy teams which is tasked to undertake activities in

order to reduce energy consumption. In 2011, Energy management system issued, and the Regulation of the Minister of Energy and Mineral Resources in 2012 relating to management of energy, becomes a reason for PT Apac Inti Corpora to implement energy management systems more focused.

In 2012, Management Representative of PT. Apac Inti Corpora was assigned to join a training of EnMS-ISO 50001 National Expert organized by UNIDO. In connection with this training, PT. Apac Inti Corpora was chosen to be a pilot company for the implementation of ISO 50001.

Through the implementation of the EnMS-ISO 50001, PT Apac Inti Corpora can achieves several advantages. These includes:

- Higher cost efficiency, specifically in energy cost, so that our products stay competitive and our business become sustainable, since energy cost percentage to total cost is significant.
- Comply with related legislation:
 - o Law No. 30 / 2007 on Energy;
 - o Government Regulation No 70 / 2009, on Energy Conservation, and;
 - o MEMR Minister Regulation No. 14 / 2012 on Energy Management.
- Demonstrate our commitment to contributing in natural preservation by to reducing CO₂ emissions.

Keys to Success

- Top Management Commitment
- Involvement of all people
- Consistency and sustainability
- Availability of resources
- Employee competence

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EnMS Development and Implementation

1.1 Business Benefit

Top management commitment of PT APAC INTI CORPORA listed its Quality, Environment, and Energy Policy is to continually improve energy performance. This commitment was translated by making long-term plans and short-term plans. For long-term plan, management has determined that there should be a reduction of energy consumption in 2015 by 20% of the average level of consumption in 2008. For the short term, the Department of Engineering and Energy Management Team are assigned to provide energy conservation program each year, to measuring and to monitoring its implementation, and to evaluate performance. Short term energy plan refers to the long term energy plan.

In 2014, PT Apac Inti Corpora was appointed by the ministry of MEMR to be the pilot project of Energy Conservation Program through ESCO Shared Saving Performance Contract (ESPC) scheme. This program was based on the result of Investment Grade Audit (IGA) supported by DANIDA. The IGA result indicates six significant opportunities (See Figure 1 below). Negotiations between PT Apac Inti corpora and ESCO is now still in progress and it is targeted that this Mid 2016 the program will be started.

Energy Saving Opportunities Summary					
ESO	Description	Investment Cost	Energy Savings	Cost Savings	SPP
		IDR	kWh/year	IDR/year	Years
Compressors	Replace the current system with new compressors	7,172,454,723	7,301,700	8,762,040,000	0.8
Motor Belt Replacement	Belt & Pulley replacement on roving and ring frames machines	2,228,394,514	1,663,892	1,996,669,858	1.1
Constant Load Motors	Replace constant load motors with High Efficiency ones	3,213,485,072	1,224,130	1,468,956,514	2.2
Ring Frame Upgrade	Belt Replacement on Ring Frame Motors with 1-speed High Efficiency motor, install a VFD and control	27,402,391,916	7,121,059	8,545,270,693	3.2
Ventilation & Humidification	Installation of a VFD on Fan Motors plus direct-compressed air Humidification system	76,869,128,407	13,153,939	15,784,726,226	4.9
Winding	Replace the current system with higher productivity machines	25,210,261,440	2,114,800	2,537,760,342	9.9
TOTAL		142,096,116,073	32,579,520	39,095,423,633	3.6

Figure 1 : Energy Saving Opportunities resulted from Investment Grade Audit (IGA)

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1.2 Drivers /Business Case

There are three main reasons of why PT Apac Inti Corpora to implementing the EnMS-ISO 50001. These includes:

- **Business competitiveness.** To achieve higher cost efficiency, specifically in energy cost, in order that our products stay competitive and our business become sustainable, since energy cost percentage to total cost is significant.
- **To meet compliance with related legislation:**
 - o Law No. 30 / 2007 on Energy;
 - o Government Regulation No 70 / 2009, on Energy Conservation, and;
 - o MEMR Minister Regulation No. 14 / 2012 on Energy Management.
- **To demonstrate our commitment** to contributing in natural preservation by to reducing CO₂ emissions.

1.3 Organizational

Before the release of ISO 50001, PT. Apac Inti Corpora already established teams saving energy that serves to carry out programs in the field of electric energy, steam and compressor. With the ISO 50001, the structure organization of Energy Management becomes more focused and synergy, led by the energy manager. The Organization Structure of Energy Management System below.

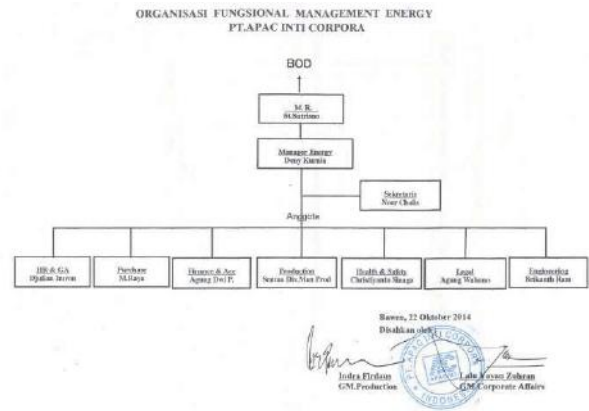


Figure 2 : Organization Structure of Energy Management System

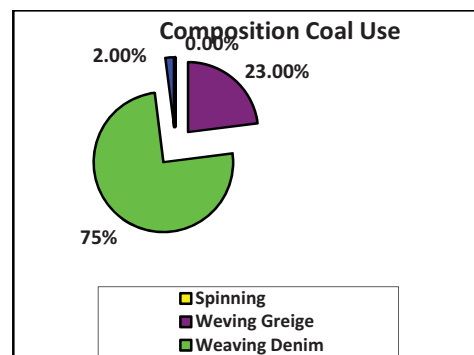
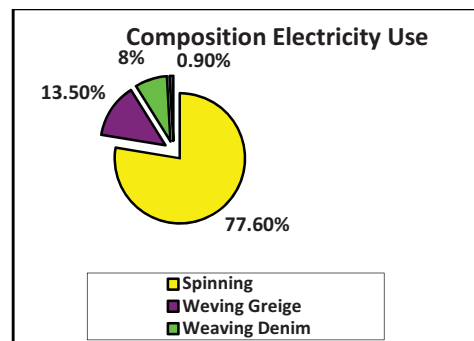
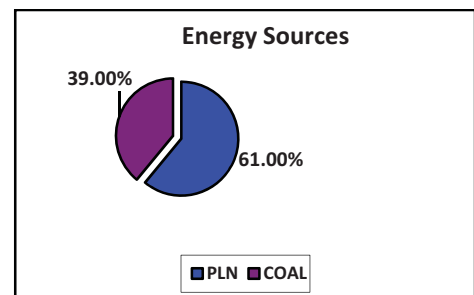
Energy management organizational structure headed by a manager of energy and consists of all parts / functions according to their respective duties. Energy managers made the reports on the implementation of energy management systems on a regular basis and reported to top management during management review meetings. In Management Review, Top management should review the organization's EnMS to ensure its continuing suitability, adequacy and effectiveness.





Figure 3 : Activities of Audit Certification ISO 50001

is supplied by State owned PLN, while Steam is supplied from coal boiler. The electrical energy is used for almost entirely to power machines wherein the composition is 77.6 % Spinning, 13.5 % for Weaving Greige, 8 % for the Weaving Denim and 0.9 % for General (Lamp). While Steam is used to process in Weaving Denim 75%, 23 % Process in Weaving Greige , Laundry Process 2 %.Sources and use of energy can be seen from the Pie Chart below.



From Energy Review, We can focused to decrease electricity consumption in Spinning and for Coal, we focused in Denim and in Boiler itself.

1.4 Energy Review and Planning

PT Apac Inti Corpora uses two energy sources, namely Electricity and Steam. Electrical energy

There are several programs in Spinning Departemen to reduce the consumption of electricity energy , that is:

1. Install inverter in AC System
2. Replacement motor with high efficient
3. Optimization of machine fuction to reduce energy consumption
4. Replacement lamp with Led Lamp.
5. Etc.

For Boiler, there are several program to reduce Energy Consumption , that is:

1. Installation of valve and pipes insulation of steam distribution
2. Steam Trap Monitoring
3. Reuse and optimization of condensat water

1.5 Development and use of professional expertise, and communications

In 2012, PT Apac Inti Corpora planned to implement Energy Management System. In the same year, UNIDO organized National Expert ISO 50001 Batch 1. Management Representative of PT. Apac Inti Corpora was assigned for training National Expert ISO 50001 and PT. Apac Inti Corpora was chosen as a pilot project for the implementation of ISO 50001.

In the Energy Minister Regulation No. 14 of 2012 on Energy Management, the Company which energy consumption of more than 6000 TOE must implement Energy Management. In implementing energy management, PT. Apac Inti Corpora appointed a energy manager certified as Energy Manager.

For technical matters related to the conservation of energy, PT. Apac Inti Corpora has sent personnels to attend training on energy conservation organized by Ministry of Energy and Mineral Resoure (MEMR) or the

Ministry of Industry (MOI). There are several personnels has been certified Energy Auditor.

1.6 Tools and Resources

When implementing an Energy Management System, PT. Apac Inti Corpora got some assisting programs carried out by the government through the Ministry of Energy and Mineral Resources (MEMR) and the Ministry of Industry (MOI). These programs is as follows:

1. National Expert ISO 50001 Program organized by MEMR and DANIDA
2. Energy Manager Training organized by PT. TUV NORD and MEMR
3. Certification Energy Manager organized by PT.TUV NORD and MEMR
4. Energy Auditor Training organized by Ministry og Industry (MOI)

In addition, internally PT. Apac Inti Corpora held a variety of programs to support the implementation of Energy Management system as follows:

1. Internal Training ISO 50001 for Supervisor and Manager Level.
2. Internal Training Conservation Energy for Technical Personnels.
3. 6 S Program where the 6th S is Saving Energy Culture.

1.7 Step taken to maintenance operational control and sustain energy performance improvement

There are several steps to maintain operational control and sustain energy performace improvement as follows:

1. Establishing and setting criteria like: procedure and SOP for effective operational and maintenance in order to

- any machines or energy equipment can operate with high efficiency
- 2. Monitor energy consumption monthly in all energy users
- 3. Evaluation of actual versus expected energy consumption.
- 4. Take action if there is potential nonconformity in energy consumption.

1.8 Approach used to 1) whether energy performance improved and 2) to validate results

The saving energy program has decrease energy consumption. Electrical Energy decline from the year 2008 - 2015.

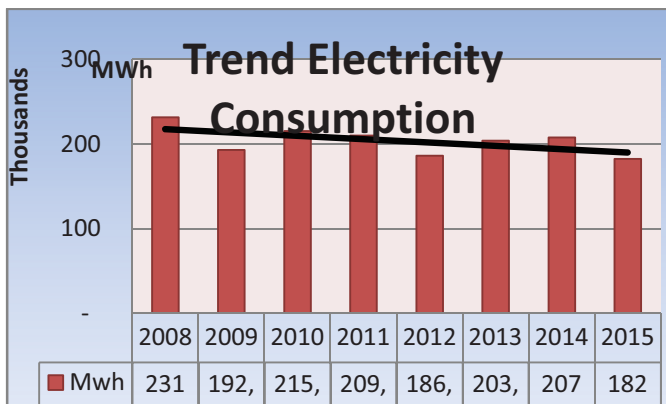


Figure 4 : Trend Electricity Consumption

PT. Apac Inti Corpora define and periodically (daily, weekly or monthly) review its measurement needs through reports and analysed data. These reports will be shared to user departemen as a reference to next periode. With these datas, any potential nonconformity can be controlles as early as possible.

1.9 Cost-benefit analysis

PT. Apac Inti Corpora has done activities of energy conservation since 2008, and from these activities, we can reduce energy consumption with cost saving 548.170 USD. With an investment of 435.719 USD, the simple payback periode is 0.79 year or 10 month.

Next programs is to implementing the result of IGA Audit, where we can reduce energy consumption significantly, and we cooperate with ESCO . We hope that this year, in collaboration with Esco has been made possible.

“With reduced energy consumption, we are directly involved with the government's program to reduce CO₂ Emissions.”

- —Stanley Sutrisno, MR—

Lessons Learned

Energy management system have gave every company guidance to reduce energy consumption. The system has shown a clear direction on which way to set the energy objective and how to energy performance through several projects performance in terms of machinery selection, energy-power source selection, manpower selection and utilities. In the existing setup the production shop floor manager sees a positive trend in improvement of productivity and quality. The entire team acknowledges that reduction in energy consumption is no more just an engineering job but a whole team effort and the onus lies on the user.

A new culture has born and remains to stay and grow with virtues of please ant workplace, better communication and a just and high morale attitude. The coming days are even more promising since everything seems to fall in place with such immaculate organization. Though this is just the start, the benefits are pouring. The result either significant or just significant, the benefits have far reaching effects in determining whole business efficiency in this world where the survival is for the fittest.

Through the Energy Management Working Group (EMWG), government officials worldwide share best practices and leverage their collective knowledge and experience to create high-impact national programs that accelerate the use of energy management systems in industry and commercial buildings. The EMWG was launched in 2010 by the Clean Energy Ministerial (CEM) and International Partnership for Energy Efficiency Cooperation (IPEEC).

For more information, please visit www.cleanenergyministerial.org/energymanagement.

