

IEooc_Application4_Exercise3: Energy Efficiency

TEAM EXERCISE (IDEALLY, FORM GROUPS OF 3 STUDENTS OR

WORK IN ANOTHER FORM OF LEARNING GROUP):

Imagine you are a team of energy efficiency consultants and you are being assigned the task of providing a set of expert recommendations to your client in order to improve the energy efficiency/ performance of his industrial/ commercial facility.

Please note that during the exercise you are allowed to make your own reasonable assumptions regarding the facility. For example you may want to know the number of operating hours/ shifts of the facility or the number and type of machines they have depending on deep you want to go. The exercise does not limit you from thinking deeper however note that the main objective of the exercise is not for you to come up with precise numbers for energy savings. It is designed for you to understand different energy efficiency strategies for different industrial/ commercial setups.

The clients:

Listed below is the list of clients that are available to you. Choose any client that you are most familiar with. Please note that it is not necessary for you to have a thorough understanding about the entire industrial processes but knowing the key steps in the processes will be enough.

1. **Gulshan Apparels Ltd.** – A large export oriented apparel manufacturing plant with over 12,000 workforce; inside an industrial park in the outskirts of Dhaka, Bangladesh. The plant has machines for cutting and sewing as well as ironing. Steam irons are used entirely and the low pressure steam is generated by 2000 kg/hr diesel boiler.
2. **Blue Ocean hotel** – A star class hotel by the Mediterranean Sea in Antalya, Turkey. The hotel is a 22 story building with 450 rooms. During the peak season rooms are expected to be fully occupied but on average the occupancy shall be about 70%. The hotel shall also provide facilities for conferences and other special events.
3. **Tanjong Cement Co. Ltd.** – A large cement manufacturing plant in Guangdong, China. At the plant the limestone is crushed and grinded. The raw material is heated and processed inside a kiln.
4. **Deutsche Bier Brewery** – A brewery located in Cologne, Germany. In this plant the malt is prepared, boiled, cooled and sent to fermentation. After that the beer is bottled and packaged. Thermal energy is heavily used in heating, cooling and fermentation processes in the brewery. Also electrical energy is used for milling/ crushing, refrigeration and packaging. Beer is also a water intensive industry.

<http://www.teaching.industrialecology.uni-freiburg.de/>

Your specific tasks:

1. Identify and prioritize the process steps within the industrial/ commercial activities that are most energy intensive.
2. What is the common industrial practice and what is the best available technology (BAT) for the top three energy intensive process steps? Use the BAT as your benchmark for estimating the energy savings potential.
3. Propose a set of recommendations (more efficient than the common practice) in order to make your client's facility more energy efficient!
4. Propose a set of energy management practices to ensure that the high level of energy efficiency achieved at the design stage is maintained over the entire operational life time of the plant/ facility.
5. Document your work on a 1 page fact sheet for your client!

What you should learn:

1. Means and strategies to achieve energy efficiency in an industrial/ commercial set up.
2. Ability to work with numbers to estimate energy saving potential (and convert it into dollars). Note that the economic payback plays a vital role in investment decisions for energy efficiency.
3. Designing a simple energy management plan.

To think further:

1. Does energy efficiency compromise on the aesthetics of the building and comfort of the people living in the building?
2. Does energy efficiency always require heavy investment?
3. Can energy efficiency be achieved solely by technological means? If not what other factors need to be addressed?
4. Can you relate to good or bad examples from your own countries regarding how energy efficiency is achieved/ not achieved in industrial and commercial setups?