

<p><u>Personal Details:</u></p> <p>1. Name :</p> <p>2. Company name:</p> <p>3. Designation:</p> <p>4. Qualification:</p> <p>5. Email Address:</p> <p>6. Complete postal address</p> <p>7. Fax No:</p>	<div> </div> <p>P.MUTHUKUMAR Rashtriya Chemicals and Fertilizers Ltd. Thal unit. Thal. Maharashtra-402208 Asst.PLANT MANAGER B.Tech (CHEMICAL) muthu_6@rediffmail.com pmuthukumar@rcfltd.com B-16/4, RCF colony, Kurul Alibag-402209, Maharashtra. Ph.NO 02141-228718, 09422493398 --</p>
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

ENERGY PERFORMANCE REPORTING

(i) POP UP EXPLANATIONS:

Presentation of Energy reporting data under EC act is an essential requirement for comparing performance with in designated consumers. Pop up explanations may vary from designated consumers to designated consumers and from process to process. So that different sets of pop up explanations are to be worked out for each type of designated consumers. Here with I submit Pops up explanations for change in costs and consumptions for two designated consumers. One is Fertilizer production units (Urea & Ammonia) and other is Heavy water plant based on ammonia exchange process.

Fertilizer production unit:

I am enclosing some of pop up explanations for change in consumption and cost for Urea and Ammonia production units. In India Urea is produced by utilizing different types of raw materials such as natural gas, coal and naphtha. All of these raw materials which may vary in their quality and cost may vary overall consumption and cost. All these points are enlisted below:

I. Increased specific consumption or cost list:

#	Reason of increased <u>energy consumption</u> KWh/unit output	Reason for increased <u>energy cost</u> Rs/unit output
1	Reduction in plant load factor due to process limitations.	Increase in raw material cost.
2	Increase in ammonia plant energy.	Increase in cost due to high inventory.
3	Increase in steam energy due to naphtha as fuel.	Reduction in plant load factor due to process limitations.
4	Reduction in output due to lack of natural gas.	Cost of electricity is high due to import from grid.
5	Reduction in out put due to lack of naphtha.	Inventory is high.
6	Planned shut down of units.	Planned shut down of units.
7	Unplanned shut down due to material/equipments failure.	Frequent maintenance of machinery/equipments.
8	Labor unrest.	Urea inventory is high.
9	Process limitations due to catalyst aging.	Raw material inventory is high.
10	Deterioration in raw material quality.	Deterioration in raw material quality.
11	Non usage of Advanced process control system	Change in GOVT. fertilizer subsidy policy.
12	Reduction in Efficiency of pumping of raw materials	Poor Maintenance Strategy.
13		Poor maintenance in Man power utility

II. Decreased specific consumption or cost list:

*	Reason of decreased <u>energy consumption</u> KWh/unit output	Reason for decreased <u>energy cost</u> Rs/unit output
1	Plant load factor in high.	Raw material cost has come down.
2	After ATA energy consumption has come down.	Overhead cost is less.
3	Decrease in steam energy due to natural gas as fuel	Availability of natural gas is high.
4	Optimum fuel and raw material mix.	Optimum fuel and raw material mix.
5	ENCON modification implemented.	High quality of raw materials
6	Plant load factor increased by replacing old catalyst with new catalyst	Change in GOVT. fertilizer subsidy policy.
7	Optimum utilization of TG sets.	Modification in catalyst leads to less energy cost.
8	Advanced process control system introduced and kept in line.	Reduction in loss and increase in effective recycling leads to less specific cost.
9	Modification in catalyst leads to less energy utilization	Recycling of byproducts and waste.
10	Reduction in loss points and increase in effective recycling.	Effective Utilization of Manpower and their skills.

11	Maximizing performance of Heat and mass transfer equipments.	
12	Recycling of byproducts and waste.	
13	Maximising On stream factor.	

A. Heavy water plant based on ammonia exchange process:

In India there are seven Heavy water plants operated by Heavy water Board, Dept. of Atomic Energy. Heavy water is produced in India by two types of processes such as ammonia hydrogen exchange process and hydrogen sulfide water exchange process. Both processes are highly energy intensive processes. In this pop up explanation section I am considering ammonia hydrogen exchange process energy consumption and cost.

I. Increased specific consumption or cost list:

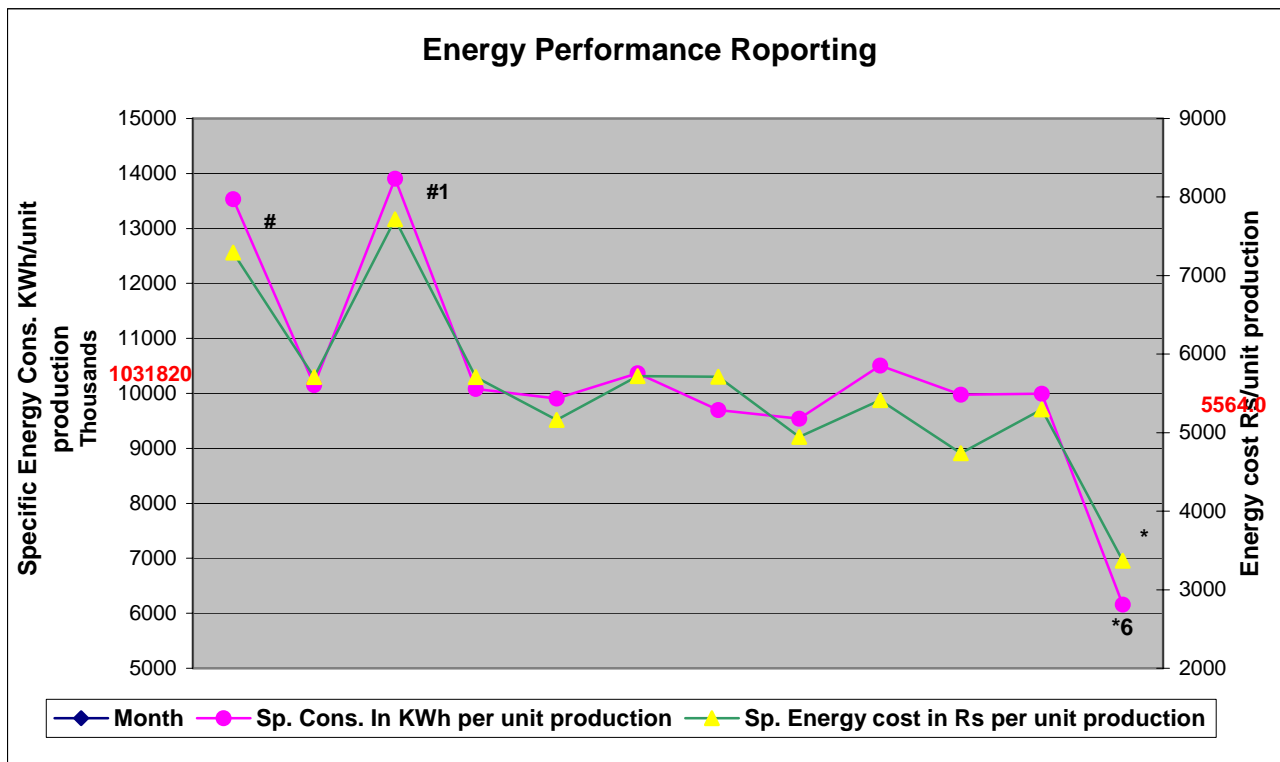
#	Reason of increased <u>energy consumption</u> KWh/unit output	Reason for increased <u>energy cost</u> Rs/unit output
1	Plant shut down due to grid power failure.	Increase in power cost.
2	Plant load factor is less due to less availability of raw materials.	Increase in natural gas cost.
3	Extraction efficiency is less.	Increase in steam cost.
4	Down stream processing efficiency is less.	Plant load factor is less.
5	Refrigeration energy is high due to summer.	Unplanned shut down due to material/equipments failure.
6	Plant load factor is less due to process limitations.	Increase in MD charges.
7	Frequent maintenance of rotary equipments.	
8	Impurities in raw material.	
9	Planned shut down of units.	
10	Unplanned shut down due to material/equipments failure.	
11	On stream factor is less.	
12	Overhead charges are high.	

II. Decreased specific consumption or cost list:

*	Reason of decreased <u>energy consumption</u> KWh/unit output	Reason for decreased <u>energy cost</u> Rs/unit output
1	Plant load factor in high.	Reduction in electricity cost.
2	On stream days are high.	Reduction in natural gas cost.
3	Down stream processing efficiency is high.	Reduction in steam cost.
4	Fewer inventories.	On stream days are high.
5	ENCON modification implemented.	Reduction in MD.
6	Planned Annual Turn Around of plant started.	Less on stream days due to planned shut down of plant.
7	Overhead cost is minimum.	
8	Refrigeration energy is less due to winter.	

(ii) REAL CASE WITH GRAPH AND POPUP EXPLANATION FOR HEAVY WATER PLANT BASED ON AMMONIA HYDROGEN EXCHANGE PROCESS:

The following graph is for 2003-04 energy performance of Heavy water plant Thal. This graph is prepared in Microsoft EXCEL sheet and presented below in chart function.



Refer explanations for #9, #1, *6 in POPUP EXPLANATIONS given below.

I. Increased specific consumption or cost list:

#	Reason of increased <u>energy consumption</u> KWh/unit output	Reason for increased <u>energy cost</u> Rs/unit output
1	Plant shut down due to grid power failure.	Increase in power cost.
2	Plant load factor is less due to less availability of raw materials.	Increase in natural gas cost.
3	Extraction efficiency is less.	Increase in steam cost.
4	Down stream processing efficiency is less.	Plant load factor is less.
5	Refrigeration energy is high due to summer.	Unplanned shut down due to material/equipments failure.
6	Plant load factor is less due to process limitations.	Increase in MD charges.
7	Frequent maintenance of rotary equipments.	
8	Impurities in raw material.	
9	Planned shut down of units.	
10	Unplanned shut down due to material/equipments failure.	
11	On stream factor is less.	
12	Overhead charges are high.	
13	Maximizing performance of Heat and mass transfer equipments.	

II. Decreased specific consumption or cost list:

* Reason of decreased <u>energy consumption</u> KWh/unit output	Reason for decreased <u>energy cost</u> Rs/unit output
1 Plant load factor in high.	Reduction in electricity cost.
2 On stream days are high.	Reduction in natural gas cost.
3 Down stream processing efficiency is high.	Reduction in steam cost.
4 Fewer inventories.	On stream days are high.
5 ENCON modification implemented.	Reduction in MD.
6 Planned Annual Turn Around of plant started.	Less on stream days due to planned shut down of plant.
7 Overhead cost is minimum.	
8 Refrigeration energy is less due to winter.	

RECOMMENTATIONS:

I am enclosing some of the points to minimize the work for presentation of data's. it shall be following steps.

1. Downloading the format from the Internet site. Will help as follows,
 - It minimize the preparation work in office,
 - Presentation will common for all.
 - Format shall vary from designated consumers to designated consumers and it will common for all designated consumers in particular section.
 - Comparison shall be made with in designated consumers.
 - Selection of top energy saving consumers shall be selected in each sector.
2. All top energy saving consumers shall be compare for best energy saving consumer.