Diagnostic Study on Clean Technology Implementation in Tiruppur Textile Cluster

@ M/s Sky Apparels

Location http://www.google.com/maps/place/11.0407838336176 12,77.31314320877 71
25/11/2023

prepared by:

Submitted Through:

WWF

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Executive Summary

WWF-India's Rivers, Wetlands & Water Policy team is launching a program for the conservation of the Noyyal and Bhavani rivers. The Industrial Water Stewardship component of the program will look at working with Textile industries along the key stretches of Noyyal to minimize their impacts on the river and ensure the long sustainability of the industries. To develop the strategy for industrial water management work and to develop a clean technology implementation plan. Under the Scaleup of Clean Technology Initiatives in Tiruppur Textile Cluster of the NB river basin program. M/s Sky Apparels enrolled for the Stewardship Program. The Preliminary visit was conducted by M/s VRNC at the unit on 25/11/2023 to identify the potential areas for Water, Energy savings.

SL #	Diagnostic Study Parameters	Observations	Remarks
01	Facility Name	Sky Apparels	
02	Facility Location	http://www.google.com/maps/place/11.040783833617612,77.3131432087771	
03	Assessment Conducted on	25/11/2023	
04	Factory Operation	Garmenting	
05	Facility Category	Small	
06	Products Manufactured	Knitted and Woven Apparel products, Hand Bags	
07	Production Capacity	1800000	
08	No of Shifts	Single Shift	
09	Hrs/Shift	8	
10	Total Number of Workforce Employed	250	
11	Pollution Control Status		
12	Certifications Obtained	ISO, Buyer Code of Conduct, Organic Certification	
13	Certifications Planned	To be discussed	
14	Awards Received	To be discussed	

Resource Consumption Details

SL #	Diagnostic Study Parameters	Observations	Remarks
15	Electrical Energy Source	Grid Electricity - LT	
16	Baseline Data Period (Mention the FY Period as YY-YY)	22-23	
17	Annual Electricity Consumption (Total)(kWh/Annum)	252434.4	
18	Annual Electricity Consumption (Grid)(kWh/Annum)	252434.4	
19	Annual Electricity generation (Renewable Energy-Wind)(kWh/Annum)	0	
20	Annual Electricity generation (Renewable Energy-Solar)(kWh/Annum)	0	
21	Annual Energy Cost (INR/Annum)	2571021	
22	Genset Diesel Consumption (Kl/Annum)	1.599	
23	Boiler Diesel Consumption (Kl/Annum)	0	
24	Annual Diesel Cost (INR/Annum)	151505.29	
25	Petrol Consumption - Logistics (Kl/Annum)	0	
26	Petrol Cost- Logistics (INR/Annum)	0	
27	Boiler Fuel Used	Biomass	
28	Boiler Fuel Used in Quantity (Ton/Annum)	0	
29	Annual Production Qty	1553199	
30	Source Water	NTADCL	
31	Quantity of Fresh Water (Kl/Annum)	14198.24	
32	Quantity of Recovered Water (KL/Annum)	0	
33	Total Quantity of Water (KL/Annum)	0	
34	Cost of Fresh Water (INR/KL)	75	
35	Cost of Recovered Water (INR/KL)	0	
36	ZLD Applicable	No	
37	Effluent Treatment Plant Category		
38	Implementation of Water Quality Watch Center		
39	Water Consumed for Domestic Use (KL/Day)	45.92	
40	Garden Area in Sq.Meter	900	
40	Water Consumed for Garden Use (KL/Day)	Not Quantified	
41	Garden & Domestic Water Use Observations	45.92	

Utility Observations			
42	Energy Source Forms of Fuels	Electricity,Diesel	
43	Assessment Observation at the Power House	There are no energy measuring and monitoring systems; it is suggested to install energy meters for major electrical loads such as compressors, air conditioners, office blocks, and ironing tables.	
44	Assessment Observation at the Compressor Room	Compressor is Screw compressor of 22kw, 150 CFM capacity. The present pressure setting is 7.0–7.5 bar; this can be reduced to the tune of 0.5–1 bar. Leakage was assessed as 35–40%. Compressed air systems optimization alone will results to energy savings of 12,372 Units per annum. which is 5% of the annual power consumption.	
45	Assessment Observation at the Genset Room	Genset power generation needs to be recorded. Presently the hour and diesel consumption are measured and monitored. The unit generation needs to be logged. (UPL)	
46	Assessment Observation at the Boiler Area	The facility has electrical boiler of 27 kW for ironing purposes. Fresh water with temperature of 30 Deg C is being supplied to boiler to generate steam. The condensate return is being discharged to the open drain. suggested to adopt waste heat recovery and pre-heat the water.	
47	Assessment Observation at the Thermopac		

Energy Saving Opportunities			
48	Scope for Energy Savings in Compressed Air Systems	Compressed Air Leak Fixing Opportunities,Scope for Pressure Optimization (Utilization),Scope for Cleaning Air Use Optimization	
49	Compressed Air Systems Savings in kWh/Annum	12372.41	
50	Lighting Systems - Observations	All the lighting systems in the facility are LED. The lighting systems can be explored with best practices such as timer-based operation.	
51	Lighting Systems - Savings Opportunities in kWh/Annum	0	
52	Lighting Systems - Estimated Investments in INR	0	
53	Lighting Systems - Estimated Savings in INR	0	
54	Electrical Motors - Observations	The factory doesn't have rewound motors. We recommend having a motor policy for the organization, through which the factory will procure only energy-efficient motors and no rewinding will be done more than twice; systems to track the rewinding of motors need to be established.	
55	Electrical Motors - Total Numbers	0	
56	Electrical Motors - Energy Saving Opportunities		
57	Energy Saving Opportunities in Electrical Motors (kWh/Annum)	0	
58	Estimated Savings- Motor Upgradation (INR/Annum)	0	
59	Waste Heat Recovery Observations	Other WHR Systems,Ironing boiler condensate heat recovery (Sparge Pipe) savings of 15659 kw/annum	
60	Scope for Waste Heat Recovery	undefined	
61	Waste Heat Recovery Fuel Savings (Tons/Annum)	15659	

Production Shopfloor			
62	Production Machine Utilization & Data Collection Aspects	From the production data, it has been learned that the rework is 1.8% and the rejection is 0.4%. It is suggested to minimize it by rework below 1% and rejection 0.2%. Suggested to explore IOT based production monitoring systems to improve productivity and develop skills.	
63	Installation status of Measuring & Monitoring Systems for Energy, Water, Fuel & Waste Etc	A water line diagram needed to be prepared. Marking of lines and the installation of meters (analog and digital) are suggested. Water meters for distribution lines, RO, restrooms, gardens, etc.	
64	Management Commitment on Energy & Resource Efficiency (Availability of Policy & Systems)	It has been observed that the management has a better understanding of the importance of energy efficiency and clean technology. However, the facility doesn't have an energy and sustainability policy or systems to track the key resource indicators.	
65	Technology Upgradation Opportunities in the Facility	The facility has the latest sewing machines, compressors, and air cooling systems. The ironing systems can be enabled with solar pre-heating systems to minimize the power cost. Sensor-based lighting systems for boundary lights to operate in an odd-even model, timer-based lighting systems, etc are available opportunities to explore. IOT-based production monitoring systems are suggested.	

Sustainability Initiatives, Material Conservation, Water Saving Measures			
66	Material Conservation & Improvement Opportunities in Packing		
67	Water Recovery & ReUse Opportunities	Scope to conserve water in the RO system, the input water has a ppm of 315, the RO product water for drinking purposes has 85 ppm, and the reject is 460 ppm. The product water ppm can be increased upto 115 ppm, which will minimize the loss of water.	
68	Scope for Renewable Energy Investment Opportunities	Small	
69	Details of Renewable Energy Projects		
70	Total Roof Area in Sq.Meter	{Total_Roof_Area_in_SqMeter}	
71	Annual Rainfall in Meters	0.650	
72	Annual Rainfall in mm	undefined	
73	Rain Water Harvesting Scope	Small	
74	Rain Water Harvesting Observation	The facility has a total roof area of 2300 Sq.M which is 52.57% of the total available area. The garden area is about 900 Sq.M which is 20.64%. The open pavement is 1120 Sq.M which is 26.61%. Presently, 76% of the rainwater harvesting potential of the facility has been achieved, which is 1055 kl/annum, or 7% of the fresh water demand. This can be increased to 8.4% by harvesting the remaining roof areas (Roof 1 other side & Parking) 130 kl/Annum	
75	Process Water Saving Opportunties	Process doesnt involve much water, we have scope on Domestic water use reduction to the tune of 4259.4 Kl/annum (30%). This can be achieved by installing Push (Auto reversing) taps at the domestic usage locations.	

Safety Observations			
76	The facility have implemented safety best practices, how ever few observations are note worthy, access to the fire extinguisher needs to be improved and better kept free from blockades. Cutting staff was found not wearing the gloves.	The facility have implemented safety best practices, how ever few observations are note worthy, access to the fire extinguisher needs to be improved and better kept free from blockades. Cutting staff was found not wearing the gloves.	
77	General Observations on Electrical Earthing & Electrical Systems		
78	Overall Observations & Remarks on Safety	The facility have implemented safety best practices, how ever few observations are note worthy, access to the fire extinguisher needs to be improved and better kept free from blockades. Cutting staff was found not wearing the gloves.	

Consolidated Table on Resource Consumption

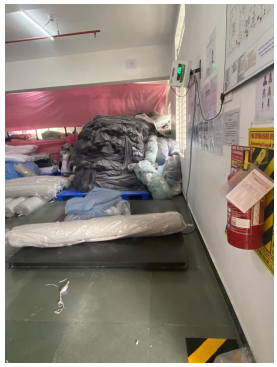
Total Production (Kgs)	1553199
Water Consumption KL/Annum	0
Fresh Water Usage KL/Annum	14198.24
Recovered Water KL/Annum	0
Electrical Energy Consumed (kWh/Annum)	252434.4
Boiler Fuel Ton/Yr	0
Specific Water Consumption (Ltrs/Kg)	9.14
Specific Energy Consumption (kWh/Kg)	0.16
Specific firewood Consumption (Kg/Kg)	
Energy Cost/Kg	9.96
Thermal Fuel Cost	1.6
Specific Water Cost /Kg	0.68
Identified Electricity Savings kWh/Yr	
Identified Fuel Savings Ton/Yr	
Identified Water Savings KL/Yr	
Identified Material Savings	
Reduction in tCO2	
Total Number of CT Opportunities Identified	

Clean Tech Opportunities Identified & Savings Potential

CT Opportunities Identified	Savings in kWh/Yr	Unit Cost in INR	Savings in INR/Yr	Investments in Lakhs	Payback in Months
Compressed Air Leak Fixing Opportunities,Scope for Pressure Optimization (Utilization),Scope for Cleaning Air Use Optimization	12372.41		undefined		
Lighting Systems - Observations	0	0	0	{Lighting_Payback}	
Electrical Motors - Energy Saving Opportunities	0				
Scope for Waste Heat Recovery	15659				
Technology Upgradation Opportunities in the Facility					
Process Water Saving Opportunties					
Rain Water Harvesting Observation					
Scope for Renewable Energy Investment Opportunities					
Assessment Observation at the Thermopac					

Glimpses of the Assessment

	
There are no energy measuring and monitoring systems; it is suggested to install energy meters for major electrical loads such as compressors, air conditioners, office blocks, and ironing tables.	Compressor is Screw compressor of 22kw, 150 CFM capacity. The present pressure setting is 7.0–7.5 bar; this can be reduced to the tune of 0.5–1 bar. Leakage was assessed as 35–40%. Compressed air systems optimization alone will results to energy savings of 12,372 Units per annum. which is 5% of the annual power consumption.
	
Genset power generation needs to be recorded. Presently the hour and diesel consumption are measured and monitored. The unit generation needs to be logged. (UPL)	The facility has electrical boiler of 27 kW for ironing purposes. Fresh water with temperature of 30 Deg C is being supplied to boiler to generate steam. The condensate return is being discharged to the open drain. suggested to adopt waste heat recovery and pre-heat the water.
Lighting_Systems_Photo	
	All the lighting systems in the facility are LED. The lighting systems can be explored with best practices such as timer-based operation.

	
It is suggested to adopt rack systems and bin cards to store the material properly, with the objective of using the floor space effectively.	From the production data, it has been learned that the rework is 1.8% and the rejection is 0.4%. It is suggested to minimize it by rework below 1% and rejection 0.2%. Suggested to explore IOT based production monitoring systems to improve productivity and develop skills.
	
Power house Sand bucket is filled with water. Need to be covered properly and periodical refilling of sand is suggested.	Weighing scale needed to get installed with wood slope to avoid accidents.
	
During rains, it has been observed that the power house is getting flooded with water. high-risk factor. We need immediate attention to fix the rainwater gutter.