

MRC Automation & Green Technology Fund

Company name: DURAMITT SDN BHD

Project location: Kulim, Kedah

Project Description: Biomass Boiler

Related Products: Supported, Unsupported and Bonded polymer dipped industrial gloves

Duration: Sep 2018 – Aug 2019

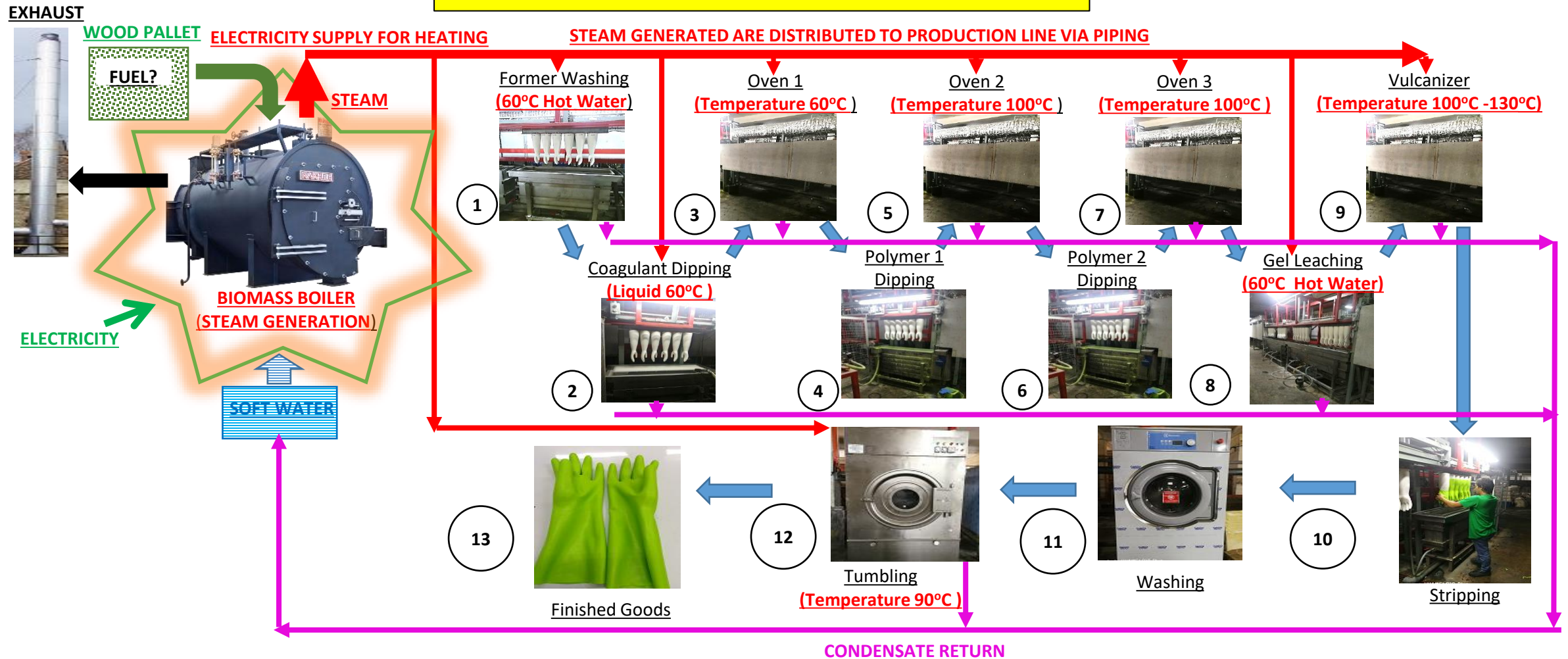
Source of financing: Bank loan



Company Profile

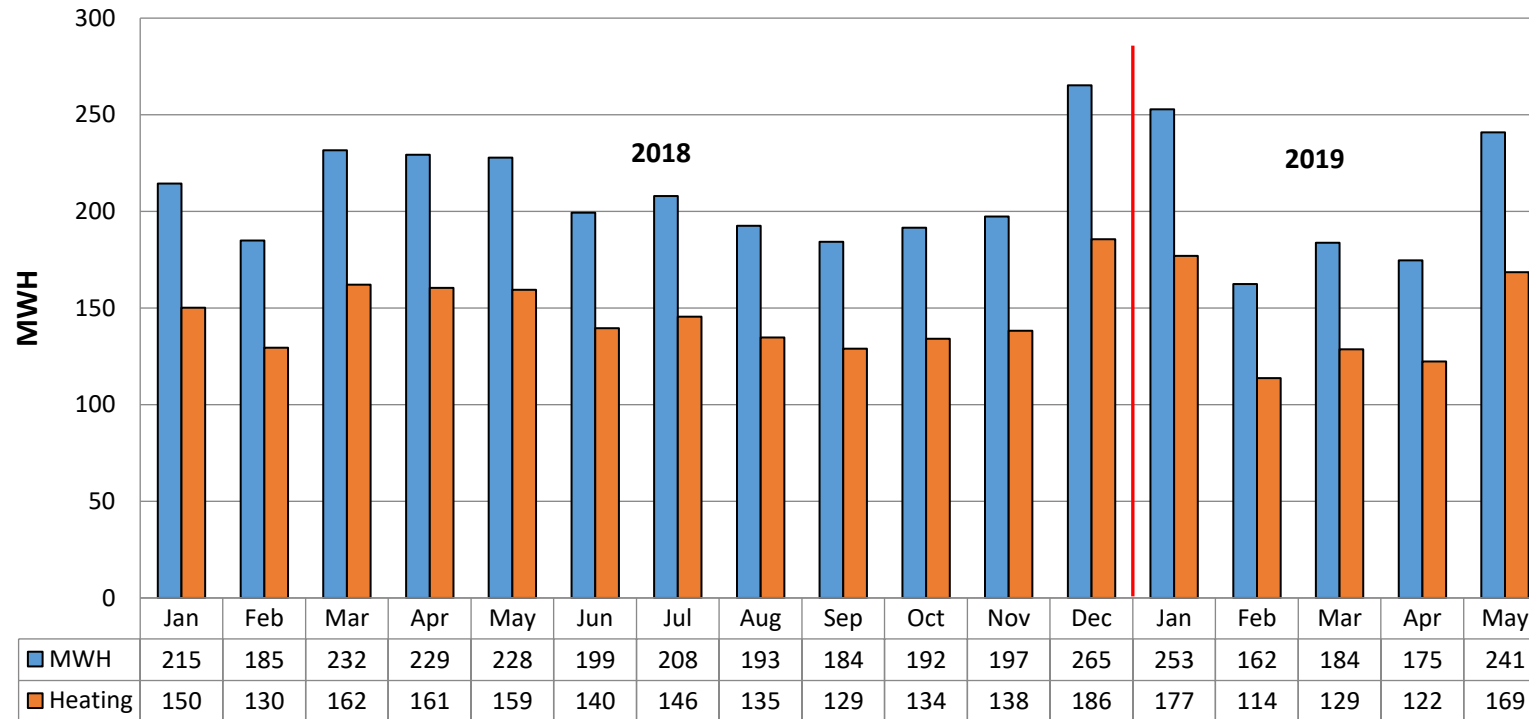
- Established in May 2000
- Our Products: Polymer Dipped And Bonded Industrial Glove

GLOVE MANUFACTURING PROCESS FLOW



Monthly Electricity Consumption

ELECTRICITY CONSUMPTION



**HEATING AMOUNTED TO 70% OF TOTAL ELECTRICITY CONSUMPTION
EQUIVALENT TO 12.5% OF DIRECT MANUFACTURING COST.**

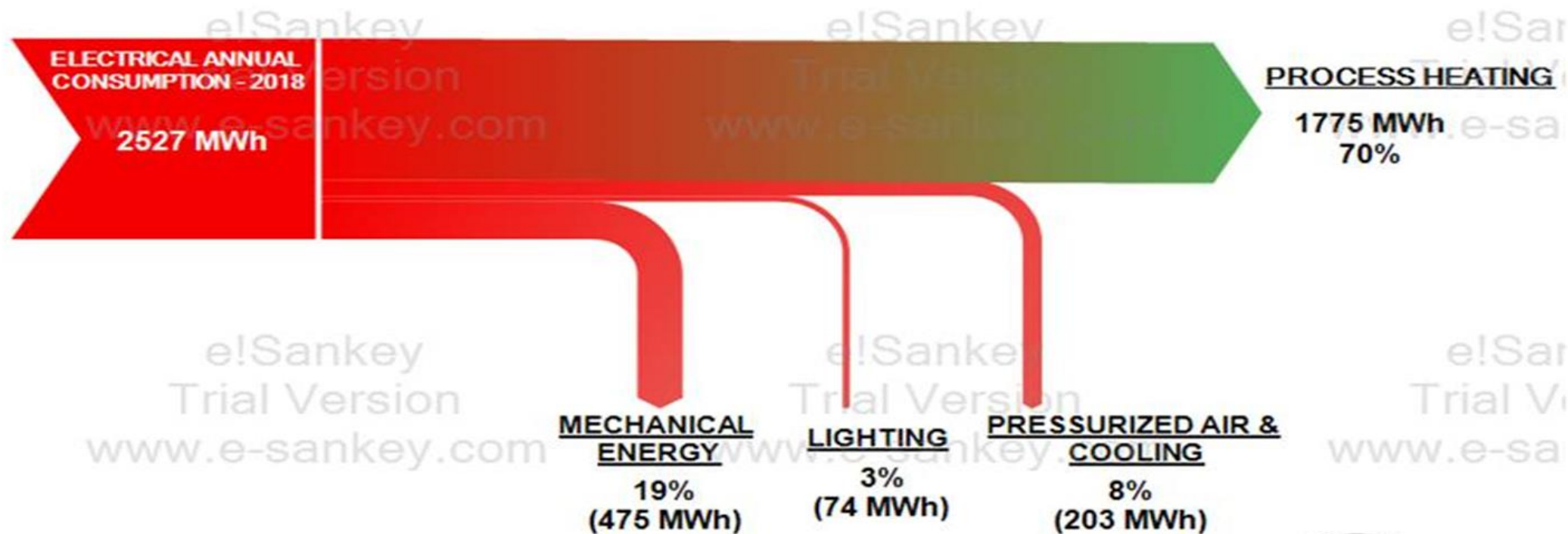
**TARGET TO REDUCE HEATING COST TO 9.5% OF DIRECT MANUFACTURING COST
24% HEATING COST REDUCTION.**

Electricity Consumption

Breakdown Of Electricity Consumption For 2018

| | <u>MWH</u> | | <u>MWH</u> | <u>%</u> |
|------------------------|-------------------------|-----------------------------|-------------------------|-----------|
| 1 Air Con | 34 | 1 Pressurized Air & Cooling | 203 | 8 |
| 2 Lighting | 74 | 2 Lighting | 74 | 3 |
| 3 Air Compressor | 112 | 3 Mechanical Movement | 475 | 19 |
| 4 Chiller | 56 | 4 Heating | 1775 | 70 |
| 5 Drive Motor | 404 | | | |
| 6 Blower | 8 | | | |
| 7 Fan | 55 | | | |
| 8 Electric Heater | 1775 | | | |
| 9 Hydraulic Power Pack | 8 | | | |
| | <hr/> 2526 <hr/> | | <hr/> 2526 <hr/> | |

DURAMITT ENERGY FLOW CHART



WHY CHOOSE PROCESS HEATING COST REDUCTION?

- **70% of Total Electrical Energy used for Process Heating.**
- **Process Heating Cost Constitute to 12.5 % of Manufacturing Cost.**

WHY BIOMASS BOILER ?

- From the research done, the most efficient fuel available at that point of time at our location is wood.
- Carbon Neutrality
- Renewable
- Reduces Waste
- It produces lower level of Sulphur Dioxide

FUEL COMPARISON

STEAM BOILER OPERATION COST CALCULATION SHEET

1 Ton of steam equivalent to 628KW

| No | PARAMETER | UNIT | Case 1 | Case 2 | Case 4 | Case 5 |
|----|--|----------|--------------|---------------|---------------------|--------------------|
| 1 | BASIS | | MFO | Diesel | Wood Pellets | Electricity |
| 2 | Steam Boiler Design Capacity | Kg/hr | 1000 | 1000 | 1000 | |
| 3 | Actual steam consumption | Kg/hr | 1000 | 1000 | 1000 | |
| | Operating hour per day | hours | 24 | 24 | 24 | 24 |
| | Operating day per month | days | 26 | 26 | 26 | 26 |
| | Thermal efficiency | % | 85 | 88 | 76 | 100 |
| | Calorific value of fuel | kCal/kg | 9850 | 10200 | 4000 | |
| | Cost of Fuel | RM/kg | 2.06 | 2.99 | 0.488 | |
| | | RM/ton | 2060 | 2990 | 488 | |
| | Cost of Electricity | RM/kWh | 0.441 | 0.441 | 0.441 | 0.441 |
| | Electricity Load | kW | 35 | 17 | 55 | 628 |
| 4 | FUEL CONSUMPTION | | | | | |
| | Hourly | kg/hr | 64 | 60 | 178 | |
| | Daily | kg/day | 1548 | 1444 | 4263 | |
| | Monthly | kg/month | 40246 | 37540 | 110842 | |
| | Yearly | kg/year | 482953 | 450481 | 1330105 | |
| 5 | FUEL COST | | | | | |
| | Hourly | RM/hr | 133 | 180 | 87 | |
| | Daily | RM/day | 3189 | 4317 | 2080 | |
| | Monthly | RM/month | 82907 | 112245 | 54091 | |
| | Yearly | RM/year | 994882 | 1346939 | 649091 | |
| 6 | ELECTRICITY COST | | | | | |
| | Hourly | RM/hr | 15 | 7 | 24 | 277 |
| | Daily | RM/day | 370 | 180 | 582 | 6647 |
| | Monthly | RM/month | 9631 | 4678 | 15135 | 172816 |
| | Yearly | RM/year | 115577 | 56138 | 181621 | 2073787 |
| 7 | LABOUR COST | | | | | |
| | Nos. of Required Operator | nos. | 3 | 3 | 6 | |
| | Estimated labour cost per hour | RM/hr | 10 | 10 | 19 | |
| | Estimated labour cost per day | RM/day | 231 | 231 | 462 | |
| | Estimated labour cost per month | RM/month | 6000 | 6000 | 12000 | |
| | Estimated labour cost per year | RM/year | 72000 | 72000 | 144000 | |
| 8 | MAINTENANCE COST | | | | | |
| | Estimated maintenance cost per hour | RM/hr | 2 | 2 | 3 | |
| | Estimated maintenance cost per day | RM/day | 48 | 38 | 64 | |
| | Estimated maintenance cost per month | RM/month | 1250 | 1000 | 1667 | |
| | Estimated maintenance cost per year | RM/year | 15000 | 12000 | 20000 | |
| 9 | TOTAL OPERATING COST | | | | | |
| | Hourly | RM/hr | 160 | 199 | 133 | 277 |
| | Daily | RM/day | 3838 | 4766 | 3188 | 6647 |
| | Monthly | RM/month | 99788 | 123923 | 82893 | 172816 |
| | Yearly | RM/year | 1197459 | 1487077 | 994713 | 2073787 |
| | Cost (RM/Kg) | | 0.160 | 0.199 | 0.133 | |
| | Equivalent Cost (RM/KWH) | | 0.255 | 0.316 | 0.212 | 0.441 |
| | % Cost Difference Against Electricity | | 42 | 28 | 52 | |

BIOMASS BOILER



BIOMASS BOILER INSTALLATION

BIOMASS BOILER OPERATION

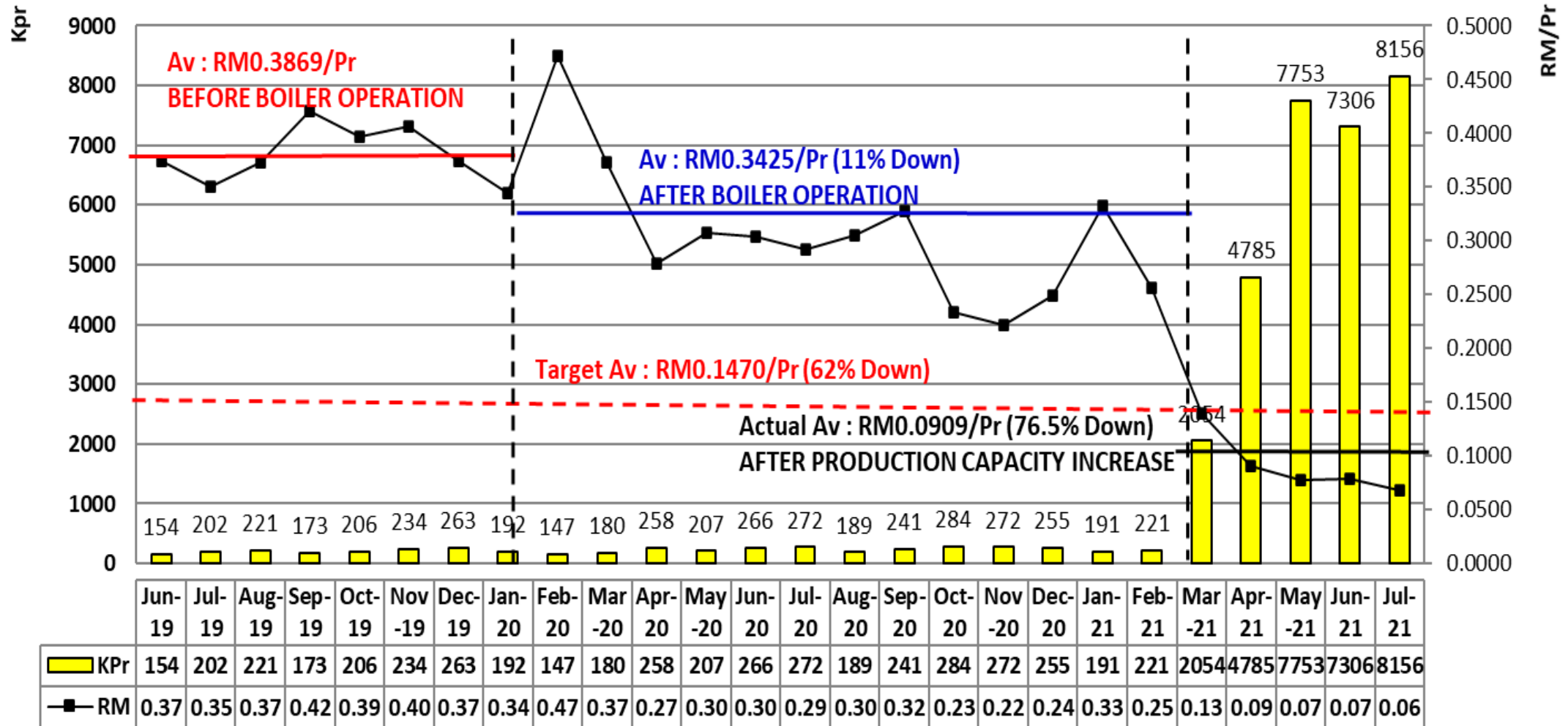


System Performance Analysis

| Energy Cost | | Energy Source | After New Boiler Installation |
|--------------------------|---|----------------|-------------------------------|
| | | Electricity | Steam |
| 1) | Total Energy Consumption (KWH) (For Heating) | 1774656 | |
| 2) | Total Production Output 2018 (Pr) | 2562324 | |
| 3) | Heating Energy per pr glove (KWH/Pr) | 0.693 | |
| 4) | Electricity Cost (RM/KWH) | 0.441 | 0.212 |
| 5) | Heating Cost Per Pair Glove (RM/Pr) | 0.305 | 0.147 |
| 6) | Total Heating Cost (KRM) | 783 | 376 |
| 7) | Saving(KRM) | | 406 |
| % Saving | | | 52 |
| <u>Capacity Increase</u> | | | |
| 8) | New Productin Line - Pr/Year | 5616000 | |
| 9) | Total Heating Cost (KRM) | 1715 | 825 |
| 10) | Saving(KRM) | | 891 |

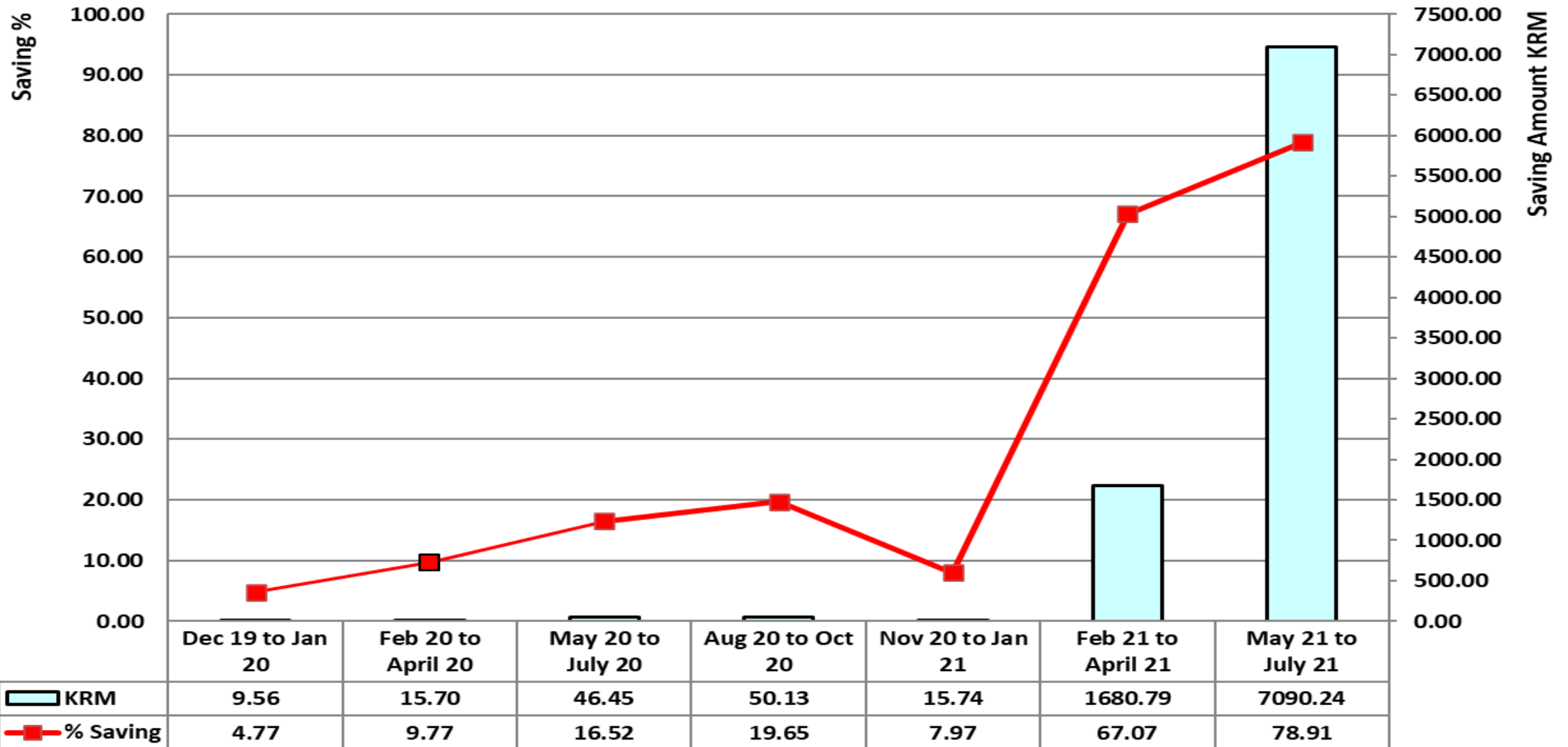
TOTAL HEATING COST TREND

TOTAL (ELECTRIC + STEAM) ENERGY COST/PR GLOVE



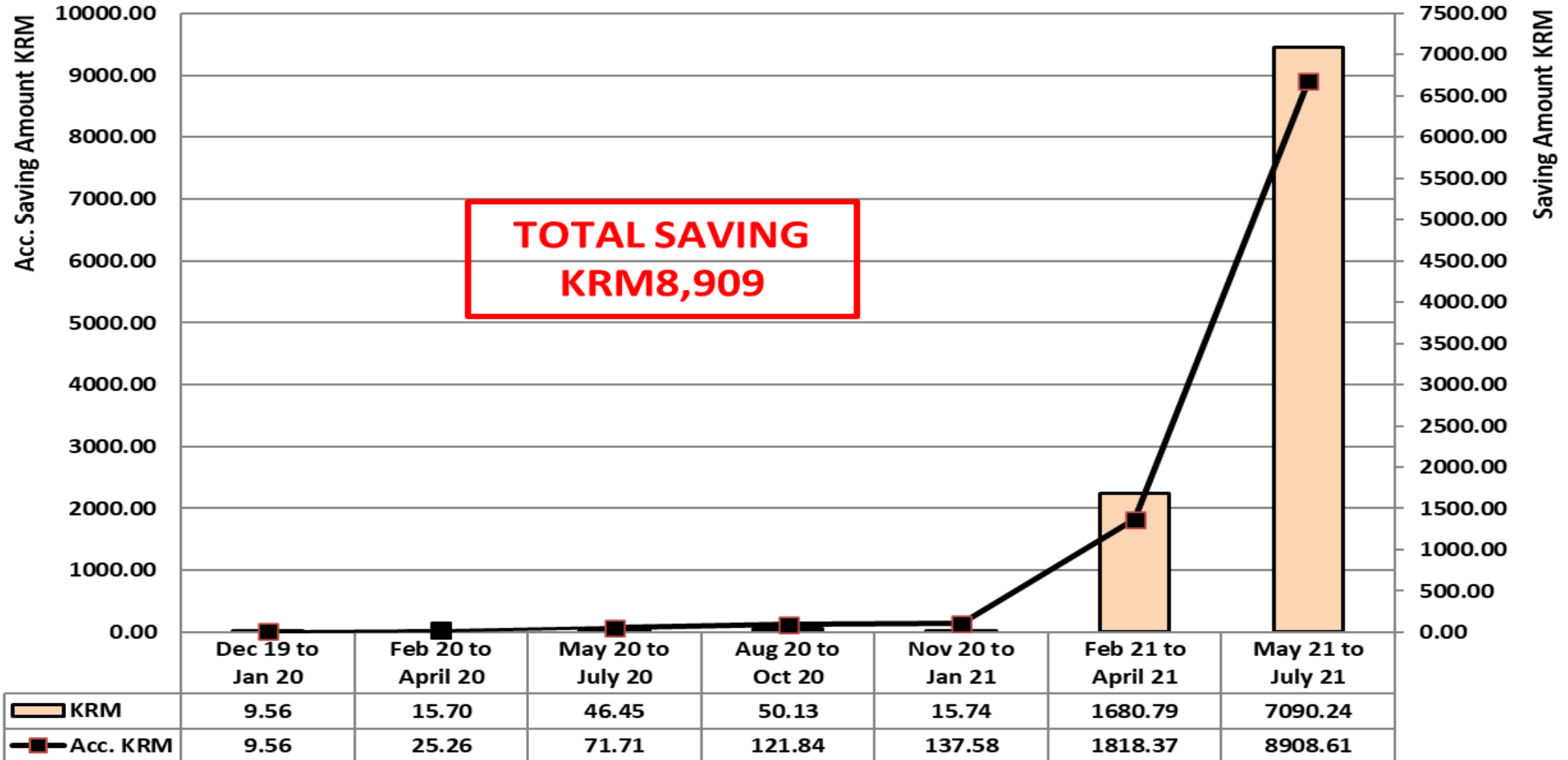
ENERGY COST SAVING TREND

Quarterly Energy Saving Trend (Combine)



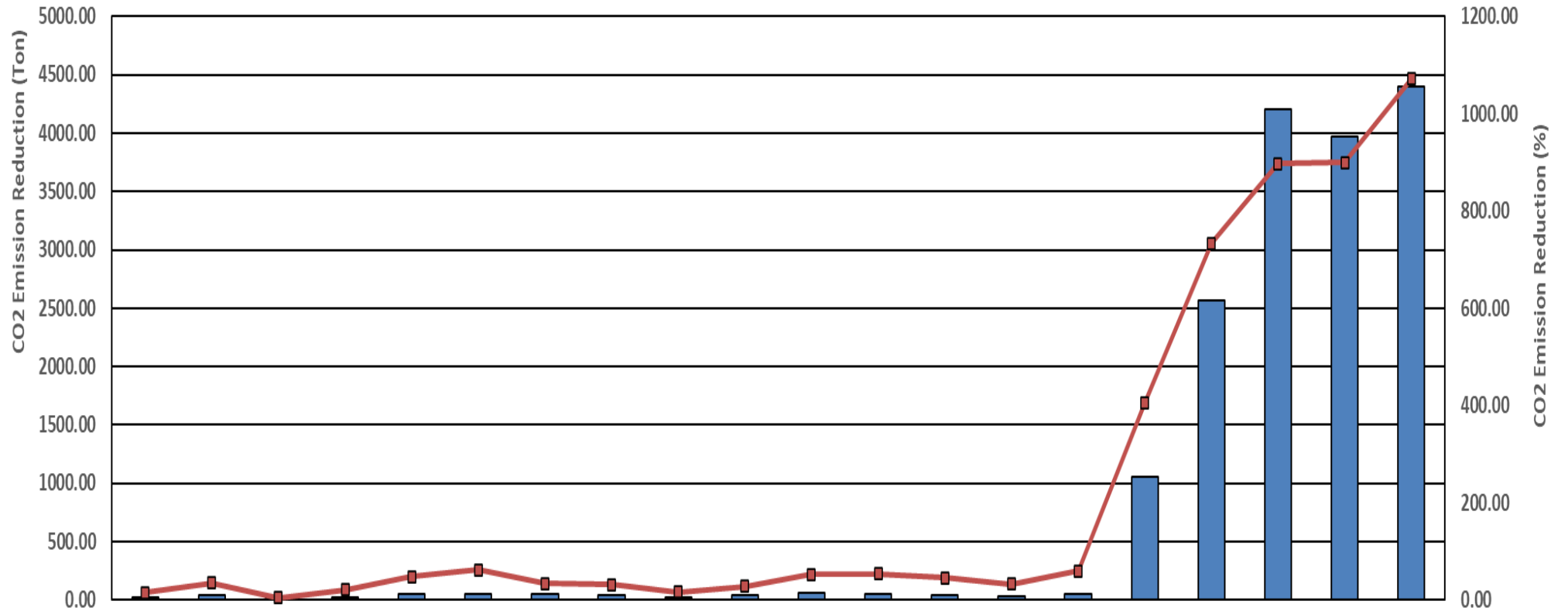
ACCUMULATED SAVING TREND (KRM)

Quarterly Accumulated Saving Trend (KRM)



GHG CO2 EMISSION REDUCTION TREND

CO2 EMISSION REDUCTION TREND



| | Dec-19 | Jan-20 | Feb-20 | Mar-20 | Apr-20 | May-20 | Jun-20 | Jul-20 | Aug-20 | Sep-20 | Oct-20 | Nov-20 | Dec-20 | Jan-21 | Feb-21 | Mar-21 | Apr-21 | May-21 | Jun-21 | Jul-21 |
|-----------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|---------|---------|---------|
| CO2 Emission Reduction(Ton) | 24.35 | 36.74 | 5.60 | 24.53 | 48.12 | 54.20 | 46.52 | 43.46 | 17.05 | 43.35 | 61.09 | 53.67 | 43.91 | 31.92 | 54.74 | 1053.56 | 2571.04 | 4203.62 | 3973.52 | 4398.85 |
| CO2 Emission Reduction(%) | 15.37 | 35.31 | 4.08 | 20.96 | 47.96 | 61.75 | 34.12 | 31.12 | 15.70 | 28.27 | 52.88 | 53.73 | 45.39 | 32.43 | 59.25 | 405.60 | 733.05 | 897.66 | 900.02 | 1071.53 |

ACHEIVEMENT SUMMARY

- Heating Cost Per Pair Glove

| | <u>RM/Pr</u> | <u>% Reduction</u> |
|---------------|---------------|--------------------|
| Original | 0.3869 | |
| Target | 0.1470 | 62.0 |
| Actual | 0.0909 | 76.5 |

- Green House Gas (CO2) Emission Reduction

16,790 Ton

THANK YOU