

## Annealing Furnace Revamping for Gas Saving

### Member company

**BAHRU STAINLESS SDN BHD**

### The Challenge

Gas consumption at Annealing Furnace 2 higher comparing to the designed specification.

### Why?

To reduce heat loss via improving energy (natural gas consumption) efficiency.

### Needed action

To carry out the annealing furnace exit section revamping, by replacing with the modified enclosed system to prevent excessive heat loss.

### Action review

*Specific:* The gas consumption was higher than the design specification and we suspected there was a big opening gap at the furnace's existing lifting roll section that had caused unnecessary heat loss in the annealing process.

The revamping proposal is to replace the lifting roll chamber section, with the modified enclosed system, that allows the exit opening to be adjustable in order to minimise the furnace heat loss.

*Measurable:* Natural gas specific



New furnace Exit lifting structure in position



Position of Carousel Roll

consumption after the revamping modification is measured and made comparison to the previous gas consumption trend to indicate the efficiency of gas consumption had been achieved.

*Achievable:* Annealing for the steel's after

the revamping indicates the reduction of gas consumption at 6% where it is equivalent to the 2.25% of the GHG emission reduction (based on 100,000 AP2 ton). See attachment for details.

*Realistic:* The gas saving from the revamping project is significant in terms of energy intensity & cost. The gas reduction also directly contributes to the Scope 1 GHG emission reduction measures.

*Time-bound:* The revamping work started in Oct 2022 and the trial runs on Nov-Dec 2022 showed the gas saving achievable at 6%.

### Horizontal Expansion Capability

Yes. The same concept of revamping at the furnace chamber could be taken as gas reduction measures for similar furnace design as improvement.

## Outcome

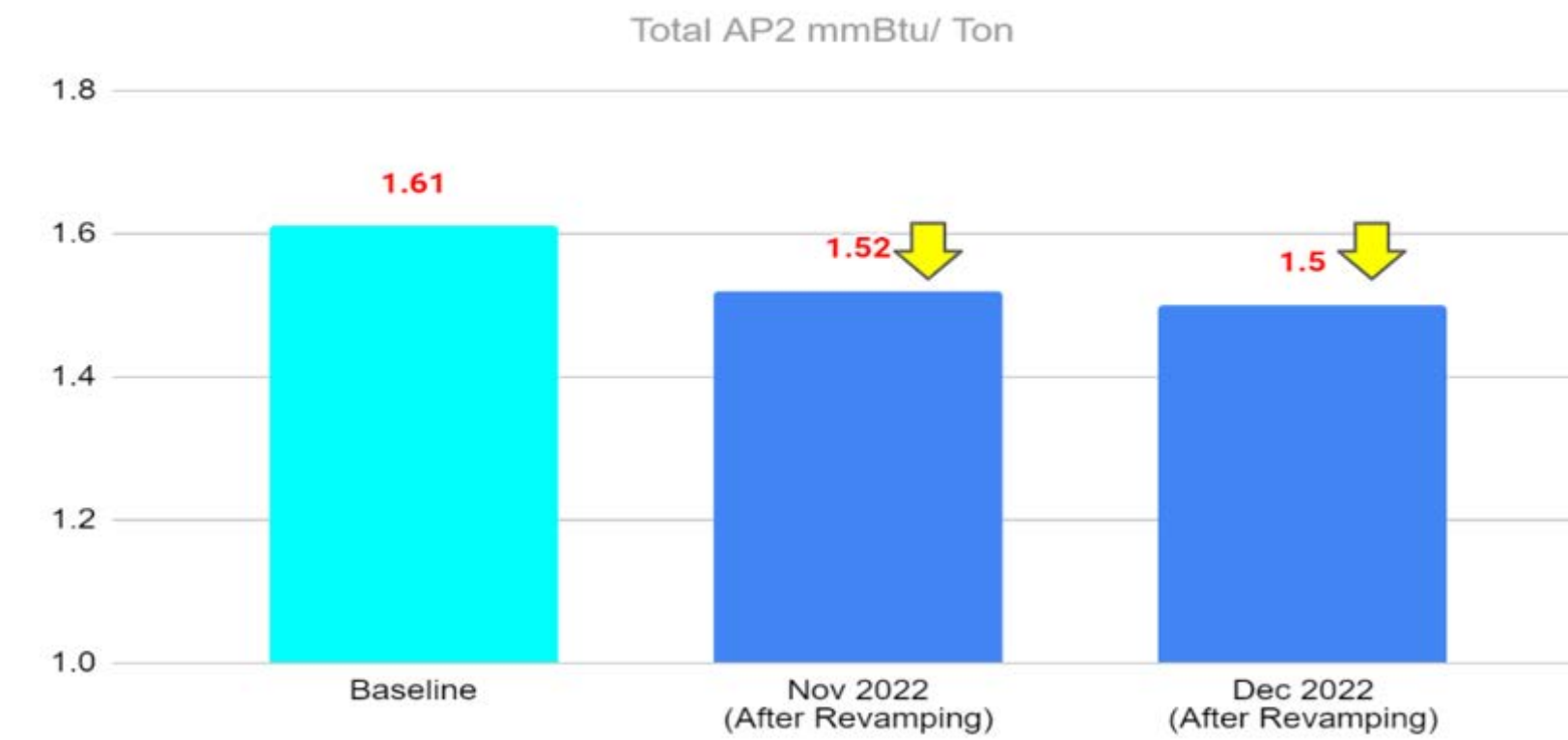
Annealing is an energy intensive process. With the elevated high cost of energy, the gas consumption reduction initiative is an important measure to obtain lower

energy operation cost and improve the energy intensity. The gas consumption reduction not only has direct savings in terms of energy cost, but also contributes to the correlated Scope 1 GHG emission reduction that aligns with the climate change mitigation action and the ESG commitments.



New furnace exit connects to hot cooling section after revamping

### AP2 GAS SPESIFIC CONSUMPTION TREND



Base line	AP2 Ton	AP2 mmBTu	Total AP2 mmBtu/ton	Gas Saving			CO2 Reduction
	101,621	163,468	1.61	Ratio %	mmBtu	GJ	Ton
After Revamp	November		1.52	5.26%	632	667	33
	December		1.50	6.54%	905	955	48
	2022 Avg Saving		1.51	5.95%	1543	1628	82