

Bahru Stainless Sdn. Bhd.

Award: Sustainability
Category: Material Efficiency

Metal Waste is NOT Waste

Challenge

Metal residue from stainless steel making process, contains Nickel, Chromium and Iron has become a waste handling issue. It is difficult to landfill for environmental reasons, and not desirable in terms of wasting metal. There are still very limited technologies available to recover the valuable metals from the stainless steel metal residue in Malaysia.

Action

Bahru had been working with a local waste recovery company to develop a reducing process to achieve a metal recovery opportunity from the Metal Oxide and Metal Scale Residue. This project not only assists to eliminate landfill by putting the priority of waste treatment to the potential metal recovery, but also contributes to the advancement of the local metal recovery process to advanced technology.

Outcome

Bahru Stainless's stainless steel making process generates tons of metal bearing waste. Local metal recovery industries in Malaysia are limited to the metal extraction and not able to recover the metal waste in oxide form. To eliminate landfill options, Bahru worked with a local waste recovery facility to initiate a potential reducing process for recovering metal oxide and metal scale residue. In 2018, a total of 1178 tons of recoverable alloy ingots were successfully produced and sent to the stainless steel manufacturer as secondary raw materials. The recovered alloys contain an average of 7.3% Nickel



Metal Oxide Dust generated by Acid Regeneration



Metal Scale generated from Scale Breaker



Furnace in Operation for Alloy Recovery



Recovered Alloy Casting Process



Recovered Alloy Ingot Final Product



Recovered Alloy Ingot in Shipment Container

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and 8.6% Chromium.

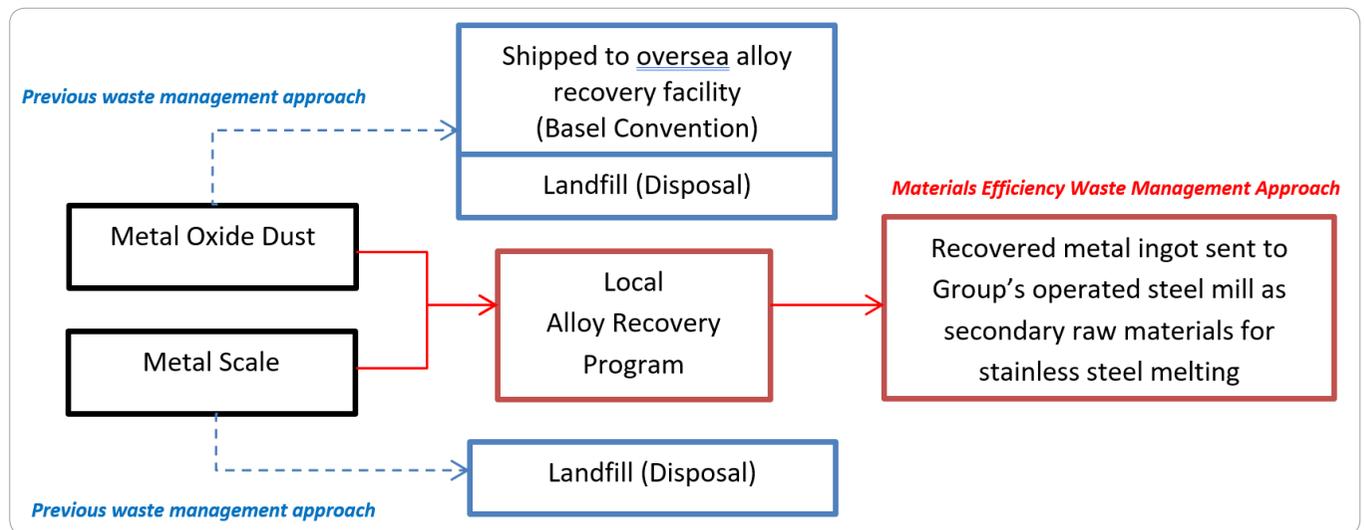
As societies move waste management practices up the hierarchy towards recovery, recycling and re-use, Bahru Stainless has played a role in motivating and assisting local waste facilities to be able to develop a new pathway towards an advanced technology level to achieve the potential metal recovery technology. Eliminating about 3,600 metric tons per annum of landfill not only brings a positive impact environmentally, Bahru Stainless has benefitted from avoiding the expensive landfill treatment fees and saved the precious metal from being treated as waste disposal as happened previously. It is estimated that Bahru will benefit from this initiative with about USD 400,000 savings per annum from metal recovery and landfill treatment avoidance charges.

The recoverable metal is treated as value added metal ingot and supply to the stainless steel process as secondary raw materials. This not only fulfills the commitment to keep Nickel within the stainless steel process life cycle, it also contributes to prevent and reduce excessive metal ore mining by natural resources conservation.

2018	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Alloys (ton)	100	--	87	91	125	--	225	100	125	100	125	100
Ni %	7.39	--	7.22	7.03	6.85	--	7.14	7.79	7.65	7.2	7.5	7.13
Cr %	8.55	--	8.32	8.15	9.31	--	6.97	8.57	9.15	8.71	9.13	8.7

Alloy Recovery Program Performance in 2018

Total 1178 tons of recovered alloy ingot is shipped to the sister company, Columbus Stainless, as the secondary raw materials for the stainless steel melting process. The recovered alloy ingots are in averaging of 7.3% of Nickel and 8.6% of Chromium.



Schematic Flow Chart of the Waste Management towards Materials Efficiency Approach