Near Technologies

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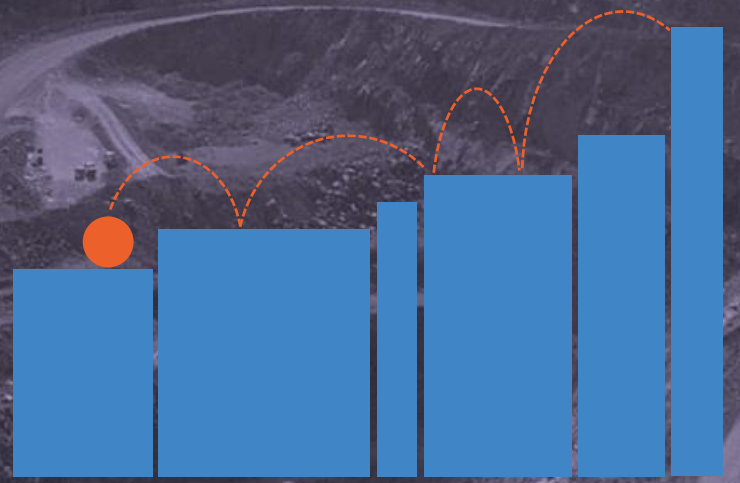
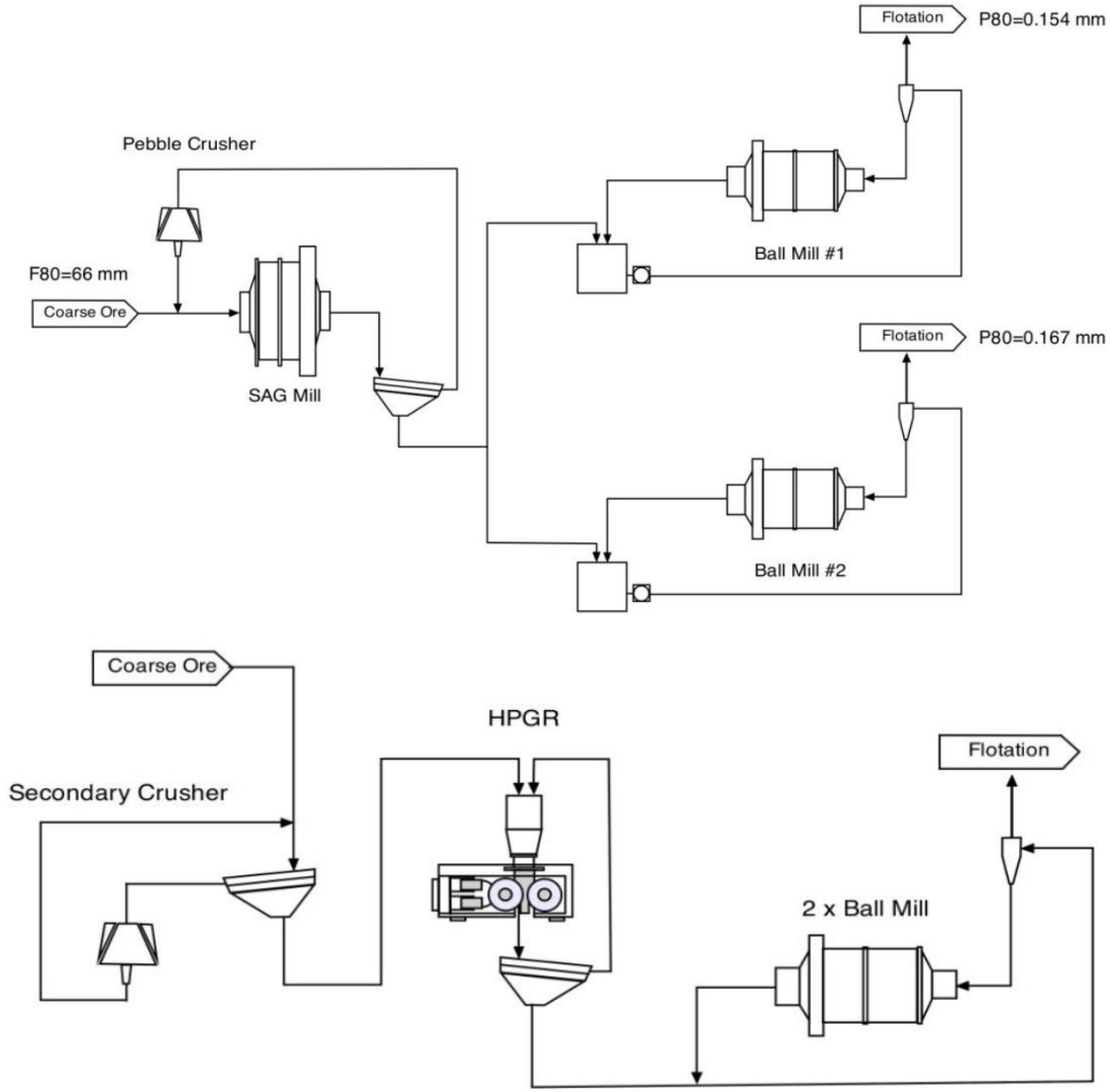
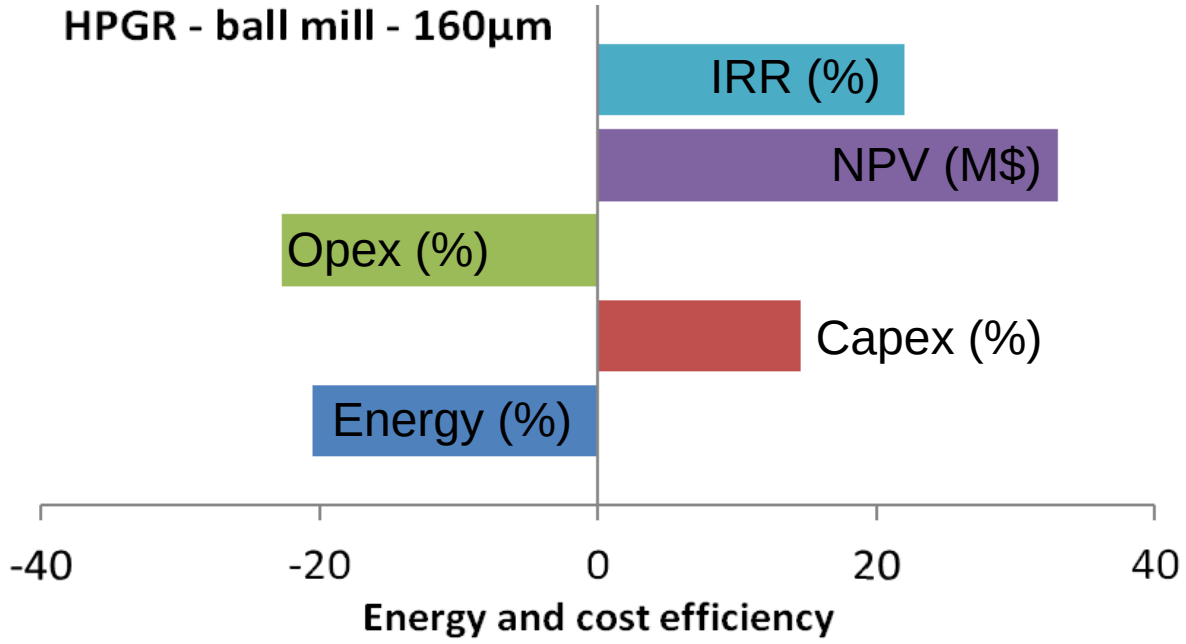


Novel HPGR circuits



(Wang et al., 2013)



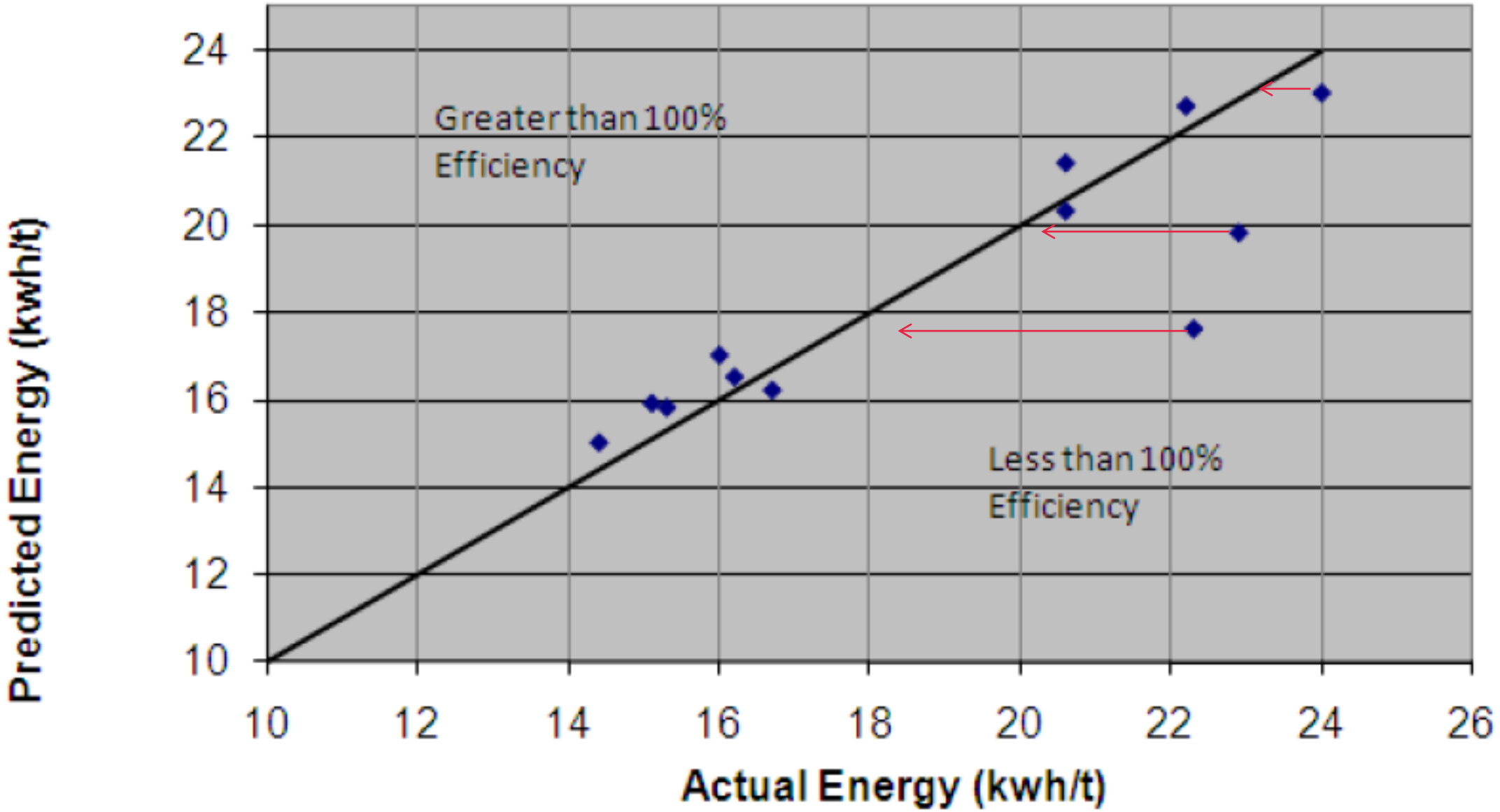
(Ballantyne and Daniel, 2013)

Mine to Mill with validation survey

Unit	Parameter	Baseline Survey	Validation Survey
SAG mill	Throughput (tph)*	307	416
	F80 (mm)	92.6	79.5
	Power (kW)	3735	3456
	Recycle rate (%)	22	23
	% solids	66	68
	Total load (%)	29.1	22.4
	Ball load (%)	11.1	12.9
Pebble crusher	Power (kW)	41	76
	CSS (mm)	24	11
Ball mill	Power (kW)	3538	3660
	Ball load (%)	35	35
	Recirculating load (%)	278	266
Cyclones	Pressure (kPa)	161	193
	Water recovery (%)	55	52
	Feed rate (m^3/h)	1083	1274
	Circuit P80 (μm)	103	141
Total Power (kW)		7314	7192
kWh/t		23.8	17.3

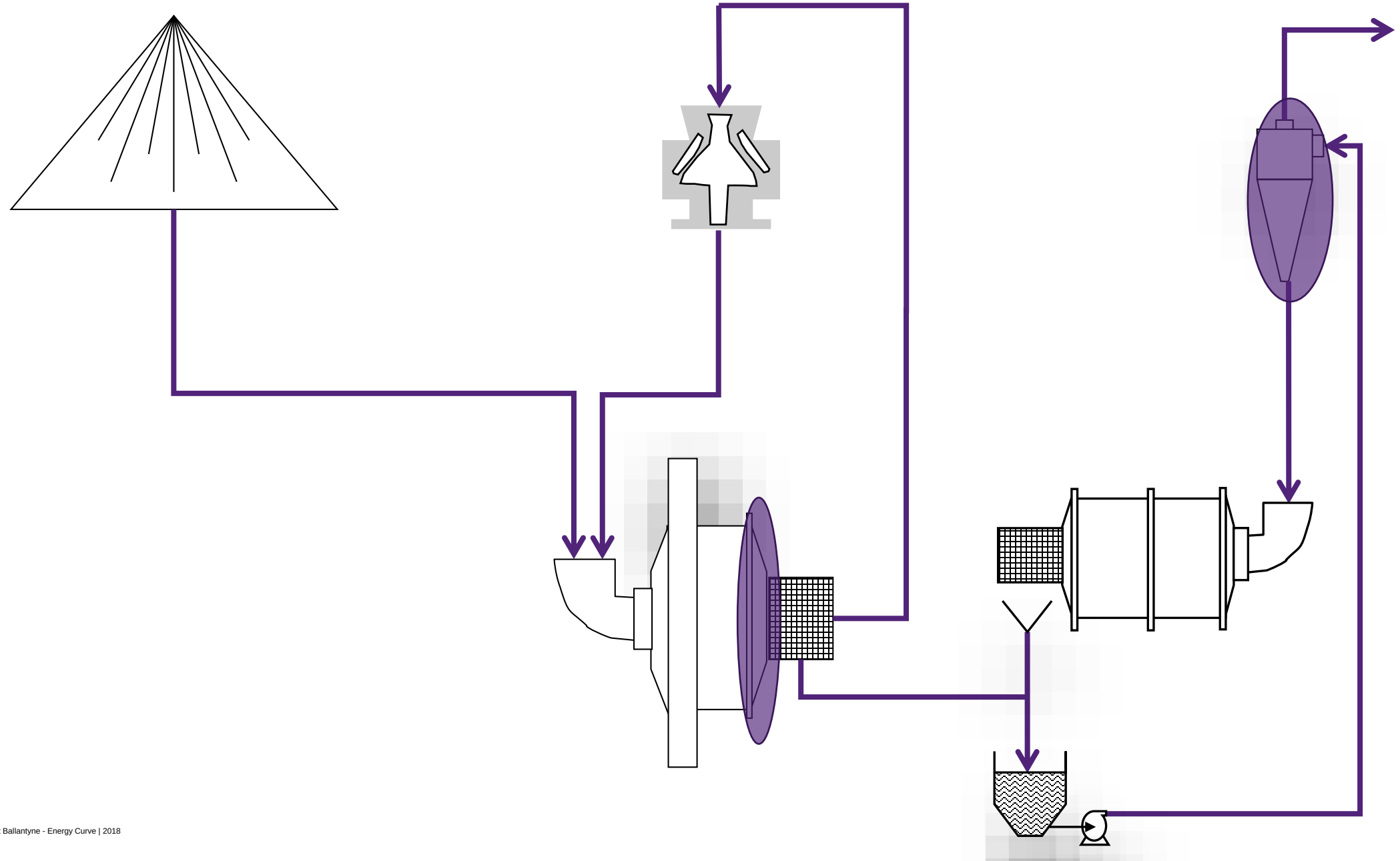
(Kanchibotla, 2015)

Barrick benchmarking and improvement example



(Buckingham et al., 2011)

Cowal Improvements



Which energy curve to use?

How to present?

What other data is required?

How to sell internally?

How to sell externally?

How to implement?

$$Specific\ Energy = \frac{(W_{crush} + W_{HPGR} + W_{SAG} + W_{ball})}{throughput\ (t/h)}$$

$$WI_{operating} = Specific\ Energy / \left(\frac{10}{\sqrt{P_{80}}} - \frac{10}{\sqrt{F_{80}}}\right)$$

$$SSE = \frac{Specific\ Energy}{\%-75\mu m\ generated\ (prod - feed)}$$

$$Cu_{e\ production} = \frac{Au_{\ production}\ x\ Au_{\ price} + Cu_{\ production}\ x\ Cu_{\ price}}{Cu_{\ price}}$$

$$kWh/t_{Cueq} = \frac{(W_{total}) * 365 * 24 * utilisation}{annual\ Cu_{e\ production}}$$