

Gulf Manganese Corporation GMC

ADDING VALUE FOR STEEL RAW MATERIALS

Capital Structure

ASX Code: GMC	
Shares	2653 m.
Perf rts	181 m.
Listed Ops	1636 m. @ 0.5c 4/19
Options	148 @ 3.4 cts
Con Notes	1 For \$1m
Price	1.2 cts
Market Cap	\$ 43.3 m.
Net cash (est)	\$ 5.1 m.

Source: Strachan Corporate

Valuation Metric

Valuation	A\$m.	\$/shr
KSH	\$ 245	0.054
Option cash	\$ 9.7	0.002
Ore sales	\$ 2.0	0.000
Corporate	-\$ 12	-0.003
TOTAL	\$ 245	0.054

Source: Strachan Corporate

Board

Craig Munro	Chairman
Hamish Bohannan	Managing Director
Andrew Wilson	Non-Exec Director

Opinion

Gulf is now on the home-strait, heading towards production of premium quality ferromanganese alloy, which is a vital component of the global steel industry.

The company is well equipped to meet logistical challenges surrounding the construction at a smelter hub, access to sufficient quantities of ore, training of plant operators and access to ongoing funding.

Strachan Corporate calculates that the prize for success is large at over \$240 million, which compares favourably with the company's current market capitalisation of \$43 million.

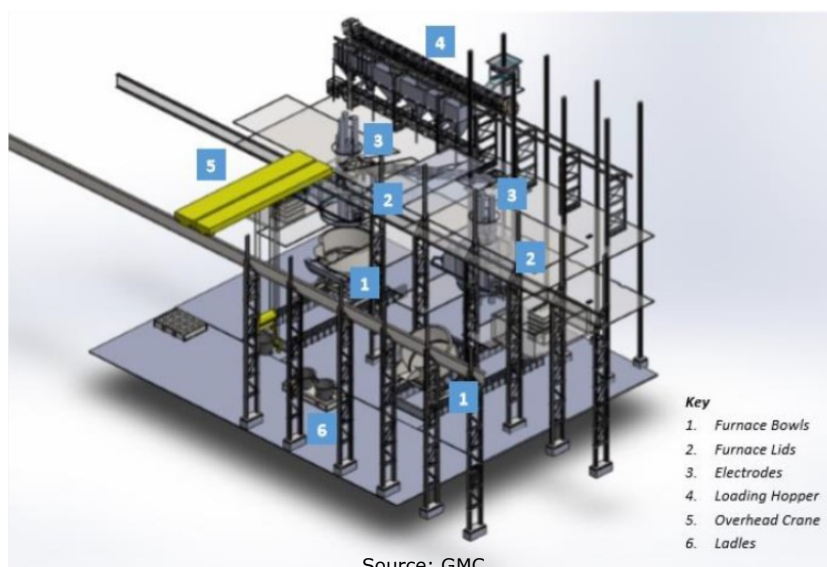
Peter Strachan



Investment Drivers

- ◆ **HIGH GRADE MANGANESE ORE → PREMIUM QUALITY FeMn ALLOY PRODUCT:** Gulf Manganese will source high-grade manganese ore from West Timor that is currently stranded. An ore feed analysis of 47-56% Mn will produce premium quality, low to medium carbon FeMn alloy grading ~82% Mn that attracts a premium price from steel mills.
- ◆ **SCALABLE, LOW CAPEX & OPEX:** Gulf will commence smelter operation using two reconditioned furnaces during Q4 '18. It has negotiated dedicated power supply at very low cost from an adjacent 150 MW coal fired power generation complex. The project has access to sufficient power and raw materials to support at least eight smelter units, lifting ultimate target FeMn alloy production from 31 Kt pa to 154 Kt pa.
- ◆ **STRATEGIC SUPPORT FOR DOWNSTREAM PROCESSING:** The Government of Indonesia's (GoI) total restriction on export of unprocessed mineral ores provides Gulf with a strategic advantage. Gulf can source competitively priced manganese ore that is otherwise stranded, for conversion to FeMn alloy to supply steel producers globally. The company has identified at least 19 idled mines in West Timor from which it can access high quality manganese raw material. Manganese ore is also found in Timor Leste as well as neighbouring islands where mines have sat idle since the GoI's 2012 ruling came into effect in January 2014.
- ◆ **STRONG LOCAL PARTNER:** PT Jayatama Tekno Sejahtera has earned a 25.1% stake in GMC's Kupang smelter project by providing a \$15 million finance package. PT Group holds investments in technology, hospitality, real estate and agriculture industries in Asia and Australia.
- ◆ **POTENTIAL FOR SHORT TERM CASH FLOW FROM ORE SALES:** In recognition of its status as an emerging downstream ore processor and to assist in establishing a strong ore supply pipeline, Gulf is working towards gaining approval from the GoI to market Mn ore ahead of commissioning its smelter.

Initial smelter skeleton



Source: GMC

Background

Building an initial 31Kt pa FeMn smelter plant in Kupang, West Timor

Gulf is constructing a ferromanganese smelter plant in West Timor, Indonesia to produce and sell premium quality, low carbon ferromanganese alloy grading 82% Mn to global steel producers.

Expansion plans depend on steel market, cash flow and ore supply

The company's Kupang Smelting Hub (KSH) facility is on track to commence smelting operations with two initial furnaces by the end of CY 2018. Gulf plans to expand production capacity from an initial 31,000 tpa from two furnaces to 153,000 tpa over five years from a total of eight smelter units. Expansion is planned to occur as the ferromanganese market allows and will depend on support from operating cash flow along with establishing adequate supply of at least 320,000 tonnes per annum of manganese ore from the region to the hub.

Development and Funding

Low CAPEX smelter development

Gulf has been able to put a ferromanganese project together at very low capital cost. Two electric arc furnaces have been purchased and reconditioned for approximately US\$4 million and are currently in transit to site. Foundation work is complete, enabling the processing plant to be assembled during H2 '18 with furnaces set to be relined and ready for use in the December quarter.

Close to port & power

Land has been leased, all civil engineering works are complete and construction is underway on a 35 acre site located 4.5 kilometres from the Port of Kupang in West Timor. Power supply of an initial 20 MVA has been contracted for a very reasonable cost of about 9 cents per kWh from an adjacent 150 MW power generation complex. An initial 2 smelting unit operation at the KSH will require 14 MVA of power supply. Power for construction is already connected on site and power for the processing plant is being established for plant commissioning, expected in Q4 '18.

Mn ore & consumables, contracted

Structural steel has been fabricated in Indonesia and is currently being delivered and fitted onto foundations that were completed by the end of May '18.

Manganese oxide ore plus reagents required, such as ferrosilicon and burnt lime have been contracted for supply to the plant while port capacity at Kupang has been allocated and set aside, designated for use by the Kupang smelter operation for import of reagents and export of final product.

Local partner earns 25.1% of project via funding

Gulf has already attracted an excellent Indonesian partner in the form of private company PT Jayatama Tekno Sejahtera ("JTS Group"), which has earned a 25.1% interest in the project. As an industrial company, Gulf Manganese is under no obligation to reduce foreign ownership. It may remain as a 74.9% partner in PT Gulf and retain 100% in any other industrial ventures it may expand into. The JTS Group is a hands-on investor with interests in technology, hospitality, real estate and agriculture industries. This partner provides a solid foothold from which further local equity might be added if required.

The JTS Group has now invested \$8 million in the project, which should be sufficient to fund plant construction and installation of an initial two furnaces that are currently on the water and due onsite by July '18.

A loan of \$7 million is available from the JTS Group to be drawn down to fund costs associated with initial commissioning of the project.

Gulf has also established a back-up Controlled Placement Agreement (CPA) with Acuity Capital that provides it with access to up to \$5 million of standby equity capital for a 2 year period. This type of funding is often seen by the market as delivering a cloud of uncertainty over the share register, but it can also provide useful access to equity at short notice. Once the CPA has expired, investors will have clearer visibility on potential value per share from the KSH project.

The company has options on issue that are in-the-money or close to the money that could contribute ~\$8 million of new equity in April '19 and \$1.5 million in September 2021.

Skills base established

Key staff, including a Chief Operating Officer with pyrometallurgical experience, a logistics coordinator, as well as mining and electrical engineers and construction management, has been employed and all are on site. Skilled operating personnel from South Africa have been contracted to assist with commissioning and training once the plant is ready to operate and key local staff are being identified in West Timor and throughout Indonesia

Kupang Smelter Hub 74.9% owned via 100% owned PT Gulf

Gulf Manganese (GMC) has a 74.9% interest in the Kupang Smelter Hub Project (KSH), through its 100% held subsidiary PT Gulf Mangan Group (PT Gulf).

Civil works at the smelter site are now largely complete and steel fabricated for the structure is set to be delivered to site during July, followed by the two refurbished smelters in July that are already in transit. In the meantime, process power along with electrical switch gear is being established to power up the plant during Q4 '18.

MANGANESE ORE SUPPLY

Gulf has identified ~150 mining permits and 77 mines in West Timor that previously produced manganese ore prior to the imposition of export restrictions in 2014. The company has so far entered into Memorandums of Understanding with 13 mines to supply manganese ore to exceed its initial requirements for 5,500 tonnes of ore per month and it is in ongoing negotiations with a further five mines. A survey of ore supply opportunities in Indonesia recognised potential extractable Mn ore supplies of 29 mt from production projects with further potential for over 80 mt of Mn ore from exploration permits.

Nearby mines plan to transport ore to site in 10 or 20 tonne trucks via the island's central road network. Mines in the northeast of West Timor plan to stockpile ore at the nearby port of Wini and bring manganese oxide ore to the KSH in 10-20,000 tonne barge loads.

The Government of Indonesia recognises that operations at mothballed mines need to be restarted ahead of planned smelter commissioning. Miners will need to re-establish their personnel, mining equipment and washing plant to meet demand from the KSH. To facilitate mine supply ramp-up, Gulf expects to be granted concessions to export direct shipping Mn ore ahead of the commencement of smelter operations. The company estimates that this activity could generate significant early cash flow during the December quarter of 2018.

While the KSH is under construction, as many as four mines could either be bought or joint ventured by Gulf to enable it to establish cash flow and ensure early ore supply. Mines visited in Timor have substantial tailings and waste stockpiles. Historic hand sorting or poorly operated mechanical concentration of ore has left a rich source of manganese ore fines from which high quality fine manganese material will easily be produced with modern metallurgical concentrating facilities.

SMELTING PROCESS

Care will be taken when commissioning the furnaces. The chemical reduction reaction between manganese oxide (MnO_2) and ferrosilicon FeSi_{75} is exothermic. Initially Mn ore (MnO_2) and burnt lime (CaO) will be melted in the arc furnace in the correct stoichiometric proportions to produce a MnO rich slag. The MnO in slag is then able to be reduced using ferrosilicon (FeSi_{75}) as the reductant. This will be achieved by initially placing ferrosilicon in the ladle and pouring the molten Mn mixture into the ladle.

No stirring should be required as mixing to achieve satisfactory and rapid contact between the slag and FeSi_{75} is expected to be achieved by cocktailing. In addition, there is provision in the design of the batch feeding system to add FeSi_{75} during the furnace tapping operation. Care needs to be taken not to overheat the furnace, which could lead to refractory damage that would eventually require the furnace to come off-line for re-bricking.

Silicothermic reduction is exothermic and occurs as:



Liquid slag and newly formed heavy alloy will separate in the ladle. Slag remaining after the reduction is lighter than the Mn alloy and floats on top of the melt. The slag is thus decanted from the alloy into one of the ladles leaving the Mn metal alloy remaining for casting, cooling and crushing for transport and sale.

Gulf has modelled the metallurgical smelting process chemistry, chemical reaction and equilibrium using software along with an extensive thermo-chemical database.

The model is based on input parameters:

- ◆ Manganese ore from West Timor with analysis 54.3% Mn
- ◆ Typical analysis for burnt lime and FeSi_{75}

Ore supplies contracted & supplies identified

Transport logistics being managed

Mine recommissioning being promoted via DSO opportunities prior to KSH commissioning

Process is well documented

- ◆ Set-point for slag basicity and CaO:SiO₂ ratio to promote manganese recovery as well as to reduce the slag liquidus temperature
- ◆ Process temperatures based on liquids temperatures of metal and slag as predicted in phase diagrams
- ◆ Empirical recoveries of elements from literature and reference operational data
- ◆ Operational data of previous smelter operations, provided by South African based Transalloys.

Typically, each tonne of product FeMn alloy will require 2.4 tonnes of Mn ore, 0.713 tonnes of burnt lime and 0.43 tonnes of ferrosilicon plus 1.87 kWh of power. Mn alloy is expected to grade over 82% Mn and up to 86.7% Mn with about 11% Fe, 1.9% Si, 0.3% C and 0.2% P.

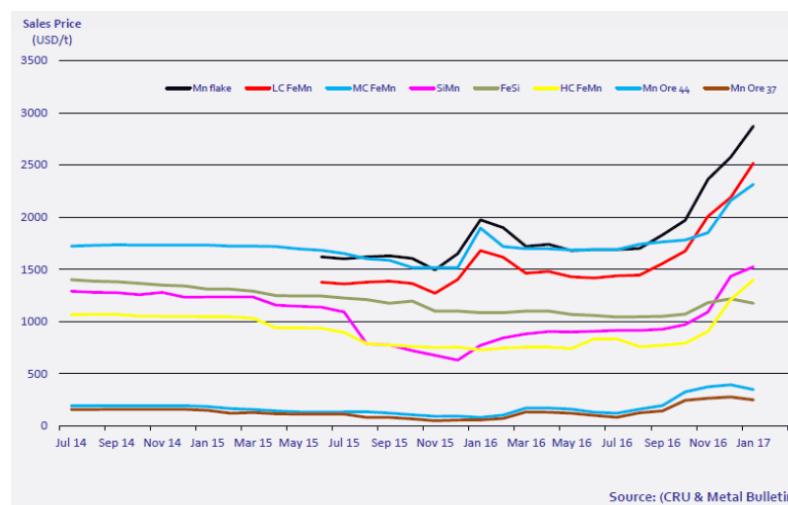
Marketing

Vital steel making raw material

Global production of ferromanganese runs at about 7 million tonnes per annum and is predominantly (90%) used in the production of steel. Typically, steel used in transport equipment and construction materials contains concentrations of 1-1.5% Mn with special steels demanding higher levels. Manganese is also used in dioxide form in dry cell batteries and increasingly in Li-ion batteries for mobile equipment, electric vehicles and grid power storage.

Increasing use in Li-ion batteries

Small amounts of manganese improve the workability of steel at high temperatures by forming a high-melting sulphide and preventing the formation of a liquid-iron sulphide at the grain boundaries. If the manganese content reaches 4%, the embrittlement of the steel becomes a dominant feature but decreases at higher manganese concentrations and reaches an acceptable level at 8%. Steel containing 8 to 15% of manganese has a high tensile strength. Steel with 12% manganese was used for British military steel helmets. Steel makers demand manganese alloy with low carbon and low phosphorus content to produce high quality steel.



Prices for low carbon (LC FeMn) and medium carbon (MC FeMn) ferro-manganese rose into 2017 and have recently retraced some of that gain.

Chinese steel production continues at record rates of around 2.1 mt per day, which is more than half of global steel production at ~4 mt per day.

Gulf employs a specialist marketing consultant and has product off-take agreements with Swiss marketing group Renova's trading subsidiary Afro Minerals Trading AG for the sale of manganese alloy and concentrate. The agreement envisages sale of up to 30,000 tpa of manganese concentrate and up to 60% of manganese alloy production over the operation's initial three years of operation.

Timor

Stable, predominantly Christian east end of Indonesian archipelago

West Timor is a fertile island at the east of the Indonesian island archipelago. The predominantly Christian Indonesian province is bordered to the east by Timor Leste. The province's capital Kupang has a population of approximately 600,000 people and is serviced by a modern Port, an international airport and a university from which suitably qualified graduates can be drawn and trained for employment at Gulf's KSH.

Valuation

Estimated NPV of +\$240 million

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Although the company sees capacity to expand to an 8 furnace operation, Strachan Corporate models a project that expands from an initial 2 units to house 6 furnace units.

Ore supply is estimated to be available at 60% of the current global market price, but better terms may be available, given Gulf's strong bargaining position.

Though alloy prices rose beyond US\$2,000 per tonne in late 2017, sales from KSH are estimated at US\$1,850 per tonne, less a 5.5% selling fee.

Capital is assumed to be offset against operating cash flow for taxation purposes with tax totalling 35% of operating cash flow. Allowing for gradual capital spending, achieving a total of 6 furnace units, Gulf's interest in the project is estimated to be worth A\$245 million. Option cash adds \$9.7 million and DSO sales are seen to have a nominal but strategically important value of \$2 million to the company.

SWOT Analysis

Strengths

SMALL & NIMBLE: Gulf has put together a small but talented team that is flexible enough to operate in the Indonesian business environment.

LOW COST PROJECT: Gulf has accessed low cost smelting equipment that it was able to refurbish and relocate. The company operates in a low labour cost environment with low cost power supply. Manganese raw material supply has no other outlet to market, improving the project's buying power to ensure strong and consistent margins through any commodity price cycle.

STRONG LOCAL PARTNER: Local contacts and partners are essential to ensure successful operation in Indonesia. Gulf has already established a 25.1% partner and is thus well placed to meet divestment obligations between years 6 and 10 of operation.

SUPPLY CONTRACTS FOR HIGH GRADE ORE: Multiple sources of Mn ore in West Timor.

Opportunities

DSO SALES: Because Gulf must stimulate manganese concentrate production from many mothballed mines, it is working to gain approval to commence direct shipping ore (DSO) sales ahead of commissioning its smelting hub.

EXPANSION: Gulf plans to quadruple its initial alloy output by adding additional processing units.

TECHNOLOGY: Gulf has an opportunity to modify its process by using low cost aluminium waste as a reductant to replace silicon.

JETTY AND POWER: At added scale, Gulf could lower costs by establishing a dedicated wharf and power plant.

Weaknesses

UNDERFUNDED: Gulf is building this project in a very economical way. Any unforeseen exogenous event could put pressure on the company's finances.

LACK OF JORC RESOURCES: West Timor has 184 mine sites but local conditions do not support a JORC classification for ore supply.

OVERCOMING PREVIOUS PERFORMANCE: West Timor has seen a procession of failed entrepreneurs whose reputation has dampened enthusiasm for Australian based projects.

LOGISTICS: The project has low cost power and access to nearby port facilities but West Timor is not well endowed with road transport infrastructure. Transporting Mn ore to the plant will take a lot of care to ensure good relations with residents along the way.

Threats

POLITICAL & REGULATORY: Indonesian regulation and laws are well cast and extremely favourable towards Gulf's business plan but may sometimes seem difficult to follow. The company must meet performance milestones to retain good standing.

COMMODITY PRICING: The price of mineral raw materials and FeMn product is largely out of the company's control, though its operating margin should be more stable.

CPA UNCERTAINTY: A controlled placement agreement entered into by the company to provide standby funding increases uncertainty surrounding the company's share register.

Board & Management

Craig Munro Chairman

Craig has an accounting, financial and corporate background. He has held senior management, executive and non-executive director positions in a number of mining companies and has over 40 years of industry experience.

Hamish Bohannan Managing Director

Hamish is a Mining Engineer and holds an MBA from Deakin University. He was previously Managing Director of Bathurst Resources.

Andrew Wilson Non Executive Director

Andrew has a B Com and a Masters of Law. He has over 30 years of experience, including 16 years with BHP and as a Director of companies with operations in Indonesia and speaks fluent Bahasa Indonesian.

Disclaimer

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