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# PROJECT MONTHLY UPDATE

## LMG'S DEMONSTRATION PLANT

### 8<sup>th</sup> September 2023

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#### Highlights:

- \* The Demonstration Plant continues to progress with no health, safety, or environmental incidents to date.
- \* Project activities remain on budget and all equipment packages fully awarded, with a total of \$17.5M committed to over 35 suppliers around the world. With all equipment delivered before 30<sup>th</sup> June, tested and dry commissioned.
- \* To date some \$30M has been spent on the demonstration plant.
- \* Construction strategy updated to self-perform. Electrical and instrumentation labour hire contract awarded to a local contractor. Structural, mechanical, and piping expected to be awarded in September.
- \* The demonstration plant is expected to reach construction completion by the end of the 4<sup>th</sup> Quarter of 2023 and first magnesium production by March 2024.

#### 1. Stage 1 Demonstration Plant Progress Update

##### Engineering

The engineering and design phase is rapidly approaching completion, with efforts directed towards supporting the construction team, remaining suppliers during fabrication activities and closeout of equipment vendor documentation. The engineering team will demobilise by the end of September with only supporting works from the EPCM's contractors head office. The preparation of handover and commissioning documentation from the EPCM contractor has commenced.

Process engineering is closing out the piping & instrumentation diagrams for design and the process control philosophy is completed. Mechanical engineering is finalising the remaining suppliers during vendor engineering with documentation reviews, final fabrication of individual equipment parts, and close-out. Civil and Structural engineering is now largely focused on miscellaneous pedestals and supporting the site construction team with any technical queries. Electrical and Instrumentation engineering is supporting vendors and miscellaneous non-process infrastructure (NPI) such as the control room.

Even though the engineering team is beginning to demobilise, the remainder of the team are focused on delivering the project on budget and continuing to identify cost reduction opportunities during construction and commissioning.

##### Procurement

Whilst major procurement packages are completed and delivered to site, procurement is focused on the purchase of miscellaneous items such as Spargers, Seal pots, Powerpacks and supporting plant operations.



**Figure:** 30km of Power and Instrumentation Cable



**Figure:** Agitators (left) and Secondary Cementitious Material Screw Conveyor (right)

## Construction

### **Construction Strategy**

The project has been facing unprecedented cost pressures leading into the construction phase. Whilst global inflationary pressures have eased, it has only been a marginal decrease from 8.7% to 7%<sup>1</sup>, construction costs have risen by up to 30%. This uncharted territory has made it challenging for the project to remain on budget and required the project team to continually optimise the project strategy to rein in cost increases. Additionally, Yallourn Power Station is undergoing a maintenance shutdown on two of its units which is impacting labour availability in the Latrobe Valley. This event coupled with the drain of local labour to Melbourne for constructing the State's infrastructure program have also restricted resources and added pressure on labour rates.

LMG were only recently advised by two of its suppliers of their skilled labour shortages. One supplier had been relying upon 4 skilled migrant workers to complete the refractory work in the furnaces. Their temporary visas were not awarded by the Federal Government, and this had a knock-on effect on the timing to complete this work. LMG was able to discuss this situation with Federal Agencies and get at least two of the visas issued and was able pull back time in the schedule.

The original construction strategy of fixed price Structural, Mechanical, Piping, Electrical and Instrumentation (SMPEI) packages has been replaced by a self-perform labour hire strategy. This will have the benefit of removing construction contractor overhead costs and profit margins, reducing construction costs. This will require additional resources from the EPCM contractors' construction team to lead the works but overall will result in construction cost savings and help reduce upward pressure on the project cost. The labour hire solutions identified have split the construction works into two main areas, Structural, Mechanical and Piping (SMP) and Electrical & Instrumentation (E&I).

The work to develop an alternative construction strategy and find labour solutions has not surprisingly taken time and impacted the schedule. The project team has elected to focus on reducing costs at the expense of the overall program and the impact of this is further explained below. This strategy was critical to ensure the project continued to meet its budget.

### **Civil**

The main civil and concrete works are ending, with the following areas completed since the last update:

- MCC's
- SCM Silo & Dust Collector
- Magnesite Silo Mixing and Holding Tanks
- Reverse Osmosis (RO) Plant
- Scrubber
- Quicklime Iso Tankers

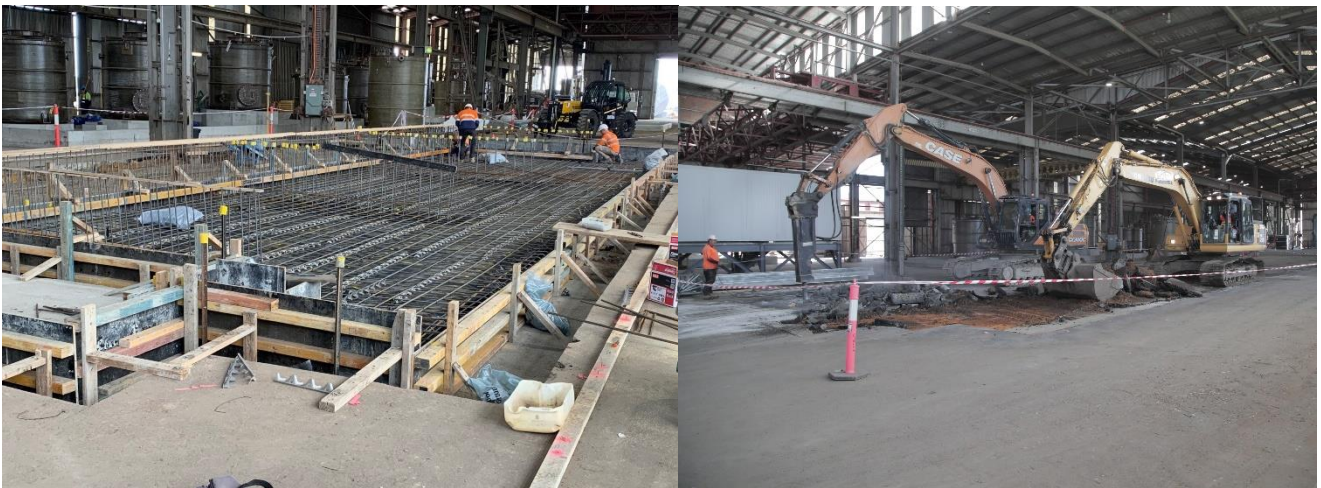
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<sup>1</sup> *International Monetary Fund, 2023*



*Figure: SCM Silo (left) and Magnesite Silo Mixing Tank (right)*

The remaining large scale civil works, only include the filtration area which has commenced with rebar and formwork complete ready for concrete pouring. Remaining work involves small miscellaneous concrete foundations and pedestals.



*Figure: Filtration Area Formwork (left) and Filtration Area Excavation (right)*

### **Structural, Mechanical and Piping**

The tender process for SMP labour hire is at an advanced stage. The project expects to award the SMP labour hire contractor within the next week.



*Figure: Erection of Pipe Rack and Supports*

### **Electrical & Instrumentation**

The EI labour hire contract has been awarded to a local contractor O&M Pty Ltd. Founded in 2013, O&M are an experienced electrical and instrumentation contractor in the Latrobe Valley and the project team is pleased to find an opportunity to bring O&M's personnel on site and benefit from their extensive experience.

The first major electrical works will be the installation of the MCC's in the switch rooms, followed by the main cable pulls from the main switchboard to the area switch rooms. This is the backbone of the electrical power network on site.



**Figure:** Installation of MCC into Switch rooms

The process for upgrading the main switchboard has commenced with a site meeting held between the EPCM contractor, LMG and AusNet personnel to determine the process for isolating power to the industrial estate to allow power to be removed from the high voltage transformer. This is to allow the low voltage side to be disconnected and the new switchboard installed. It is expected this process will take place over the next couple of months. A temporary generator will be brought to site to provide power for construction during the works, which is expected to take two weeks.

### **Spray Roaster**

Stable Engineering, who are fabricating the Spray Roaster vessel, the Oxide bin and the retort/condenser assemblies have experienced labour challenges due to competing works e.g., Yallourn shutdown. The project team has instigated an overtime program to recover the schedule progress on the Spray Roaster and are now confident the Spray Roaster vessel will be reassembled into one piece and lifted into position ready to commence refractory installation in October. The remainder of the Spray Roaster area equipment has already been tested to Stage 2 (see commissioning further below) and the vessel itself was already dry assembled in the vendors shop in Vietnam. It was disassembled for transport and is being reassembled at Stable Engineering before being installed into the structural steelwork as one item to reduce field construction labour. As such the Spray Roaster has already passed Stage 2 commissioning.



**Figure:** Workshop Fabrication of Spray Roaster Reactor Shell

## Schedule

The project schedule has undergone an extensive review over the last few weeks to identify the impact of the change in construction strategy. Additionally with the change to self-perform construction, the EPCM contractor has had to develop a detailed Level 5 schedule to be able to manage the works, when typically, this work would have undertaken by the construction contractors. Some 2,000 activities were added to the schedule, necessitating time to complete.

The construction completion date is now the end of December 2023 with Stage 3 commissioning targeted to commence in January 2024. First Magnesium is targeted for March 2024.

Any further changes to this timetable will be included in future monthly updates.

## Commissioning

LMG has a five-stage commissioning process that commences upon Mechanical Completion of a system and sub system. The stages in the commissioning process and the typical activities undertaken are:

1. **Pre-Commissioning** – Low Voltage cable testing, megger test motors, point to point checks, pressure tests etc.
2. **Dry-Commissioning** – energisation of equipment, motor direction testing, functional testing of equipment starts etc.
3. **Wet-Commissioning** – water runs, loop testing, run tests of dry equipment, reagent loading, spares in place etc.
4. **Ore-Commissioning** – introduce ash, equipment integrity checks, interlock and loop confirmation, continuous running of the plant etc.
5. **Ramp Up** – production ramp up

Systems and sub systems are sections of the physical scope that are broken down into blocks to allow the commissioning team to commence commissioning even whilst construction is still occurring in other sections. This allows for a faster startup and the operations team to start to gain familiarity with plant systems prior to Stage 4 when they take control.

Despite SMP construction ramping up, the construction and commissioning team proceeded with equipment installation for all equipment delivered prior to the 30th of June to ensure that the equipment achieved Stage 2 Dry-Commissioning.

The commissioning team will continue to advance the equipment commissioning through the stages as well as commence the commissioning for piping, cabling etc. as construction completes each subsystem.

## 2. Operations

The project operational readiness plan is being developed but early operational works have commenced with recruitment of local personnel in administrative and finance functions.

Reagents are now progressively being ordered in readiness to support initial commissioning requirements. An order for magnesite has been placed with Australian supplier Causmag, while an initial order for 40 tonnes of ferrosilicon has been committed with OM Materials in Sarawak, Malaysia. Our supplier of LPG to the plant has also been contracted, and they are currently working diligently on the installation of the related storage infrastructure at site.

Further to the above, LMG has now down-selected preferred supplies for both Industrial Gases and Industrial Acids. Contracts with these vendors are presently under final negotiation and will be announced in due course.



Product sales opportunities are also being pursued vigorously. Product trials have been conducted, or are planned to be conducted, for all the by-product materials produced by the demonstration plant. Negotiations on these by-products are currently commercial-in-confidence, but further details will be announced as is appropriate.

### **3. Summary**

LMG will release monthly updates so that all stakeholders can follow the construction and commissioning journey of LMG's demonstration plant as it reaches completion and enters its production phase.

Whilst the development plant has taken longer than initially expected, the management team have been able to negotiate a difficult time in Australia's construction history and maintain the project budget while delivering the project only some 6 months late.

Should you have any queries in relation to this announcement please do not hesitate to contact the CEO on his mobile 0421 234 688.



**David Paterson**  
Chief Executive Officer

8 September 2023

## About Latrobe Magnesium

Latrobe Magnesium is developing a magnesium production plant in Victoria's Latrobe Valley using its world first patented extraction process. LMG intends to extract and sell magnesium metal and cementitious material from industrial fly ash, which is currently a waste resource from Yallourn brown coal power generation.

LMG has completed a feasibility study validating its combined hydrometallurgical / thermal reduction process that extracts the metal. Early construction has commenced on its Stage 1, initial 1,000 tonne per annum magnesium plant with commissioning targeted to commence end of Q3 2023.

A commercial plant will then be developed, with a capacity of +10,000 tonne per annum magnesium, shortly thereafter. Further plant capacity expansion will be determined once Geotech works have been completed on the existing Yallourn landfill due for completion by the end of 2023. The plant will be in the heart of Victoria's coal power generation precinct, providing immediate access to feedstock, infrastructure, and labour.

LMG plans to sell the refined magnesium under long-term contracts to USA and Japanese customers. Currently, Australia imports 100% of the 8,000 tonnes annually consumed.

Magnesium has the best strength-to-weight ratio of all common structural metals and is increasingly used in the manufacture of car parts, laptop computers, mobile phones, and power tools.

The LMG project is at the forefront of environmental benefit – by recycling power plant waste, avoiding landfill and is a low CO<sub>2</sub> emitter. LMG adopts the principles of an industrial ecology system.