

MAGNUS ENERGY GROUP LTD.

(Incorporated in Singapore)

(Registration No. 198301375M)

RESPONSE TO SGX-ST'S QUERIES

Capitalised terms used herein shall have the definitions ascribed to them in the Company's announcements dated 22 June 2016 and 7 February 2017, (the "Previous Announcements"), unless otherwise stated or the context otherwise requires.

Introduction

As announced on 22 June 2016, a wholly owned subsidiary of Magnus Energy Group Ltd. (the "**Company**" and together with its subsidiaries, the "**Group**"), MEG Management Sdn Bhd, entered into an engineering, procurement and construction ("**EPC**") contract and an operation and maintenance agreement, ("**O&M Agreement**") with Algae Farm Engineering Sdn Bhd ("**AFE**"), to build and manage a microalgae oil cultivation facility (the "**Plant**") in Selangor, Malaysia (the "**Project**"). The completion timeline for the construction of the site was initially expected to be some time during the fourth quarter of the Group's current financial year ended 30 June 2017, however, due to delay in fund raising, the Project was delayed and our expected completion is estimated to be in the first quarter of financial year ending 30 June 2018. The Group is seeking to raise sufficient and timely funds via the existing Notes Issue program, and is also considering to realise some liquid assets and seek plausible bank loans to complete the construction of the site.

SGX-ST Query 1

What due diligence did the Company do on this microalgae oil cultivation facility before investing?

Company's response**➤ Financial Due Diligence**

The Project budget of US\$12.75 million is expected to be recovered within 4 years. The expected gross profit per MT of production is approximately 70%. The expected net profit per year is approximately US\$3.5 million per year. The agreement with AFE provides the operation and maintenance cost at fixed rates on a per metric ton basis. AFE has demonstrated and presented to Magnus that their cost structure is sustainable and able to contain the aforesaid fixed rates. The cost per ton of production provided by AFE under the operation and maintenance agreement is US\$170 per MT, which is about US\$20 per barrel of crude algae oil ("Crude Oil"). The EBITA projection is approximately 70%. The projected yield of the Crude Oil is in excess of 2,500 MT per hectare per year, as compared to palm oil yield of 6 MT per hectare per year. Based on the huge volume of Crude Oil that the Company is projecting to produce, the Crude Oil shall be ultimately sold to refineries for further processing into products like bio-diesel, jet fuel, marine fuel, etc.

*Profitability and project budget funding of the Project have been duly considered by the Board of Directors, ("**the Board**") and Audit committee, and barring unforeseen circumstances, the directors are satisfied that Magnus shall be able to meet the required funding from the present facilities and working capital that are available to the Group and that the Project shall be expected to yield positive results for the Group.*

➤ Operational Due Diligence

*In 2016, Mr Kim Jae Hoon ("**Mr Kim**"), built his proto-type plant and physically proven the growth of algae in the tanks. The automatic harvesting machine is critical to the success of the project. The size of the cultivation tank is also the result of his research & development ("**R&D**"). The Harvesting Machine Version 2 has the capability to harvest 4 tanks of algae while the Version 3 has the capability to harvest 24 tanks of algae, which is more efficient than the Version 2. Nevertheless, this is a new machine which is proven under technical specifications but have yet to be implemented on site.*

RESPONSE TO SGX-ST'S QUERIES

The aim of the Company is to cultivate microalgae for mass microalgae crude oil production. Mr Kim started his operations in Korea and the reason for Mr Kim to move his operations to Malaysia is mainly due to climate conditions. A near equator location is more suitable for mass cultivation.

➤ **Legal Due Diligence**

The Company has conducted searches on AFE, related companies and the registered patent rights of Mr Kim in Korea.

➤ **Risk Management**

▪ Operational Risk/Aspects

AFE has represented to Magnus that, together with Weschem Technologies Sdn Bhd, ("Weschem"), it has set up a bio-oil processing plant ("Processing Plant") about 2km from the plot of land that we are setting up our cultivation plant. The Processing Plant, as represented by Mr Kim, shall cost about US\$6m. Mr Kim has confirmed to Magnus that AFE shall not proceed to fully acquire this Plant due to cash flow considerations. Nevertheless, this does not affect the processing of the microalgae as this Processing Plant has a processing capability and capacity of 200 MT per day.

By way of an O&M Agreement, AFE is employed as the operations and maintenance contractor. AFE is benefitting from the EPC Contract and O&M Agreement. AFE has a deep vested interest in the cultivation plant that we are building. So long as Magnus' cultivation plant continues to operate, AFE shall continue to be profitable. No fees are payable by Magnus to AFE if there is no successful production.

▪ Risk of Price Fluctuation

The current pricing strategy is to peg our crude microalgae oil at approximately 10% discount to the Palm Oil price. As the world has not been able to produce substantial amount of crude microalgae oil, the above pricing strategy may evolve in accordance to demand in the event that mass production capability is duly proven.

Alternative/Food Based Source	USD / MT @ Feb 2017
Algae Oil	650.00
Rapeseed Oil	917.37
Palm Oil	726.49
Soybean Oil	763.02
Sunflower Oil	980.86

Source: www.indexmundi.com (individually tabulated by Company)

▪ Risk of Production Competition

Magnus has entered into an O&M Agreement with AFE and a License Agreement with Mr Kim for the continued use of the patents. If the O&M Agreement is terminated due to Contractor's default on any material performance under the O&M Agreement and which could not be remediable, AFE shall fully compensate MEG under such conditions, including the Contract Price of US\$12.75 million less Contractor Financing. No financing has been provided by the Contractor as at the date of this announcement.

A team of engineers and production staff shall be duly trained to operate the cultivation site and the cultivation technology to ensure the continuity of the production. Further, we are also in discussion with Mr Kim and AFE to fully acquire AFE and Mr Kim's patents. These shall be duly negotiated on the success of this very cultivation plant. Kindly refer to the section on "Mr Kim's Patents" below.

RESPONSE TO SGX-ST'S QUERIES

Referring to the above table and below section on "Market & Demand", the existing world production of algae oil is inconsequential to meet the future demands, thus diminishing the risk of competition in the next five years.

▪ *Mr Kim's Skills and Knowledge*

Mr Kim has the technical and scientific know-how for the Project. We are reliant on Mr Kim and his knowledge. Please refer to the sections on "Mr Kim's Patents" and his past records below. We are unable to compel Mr Kim to enter into a non-compete agreement with us.

▪ *Risk of Patent Expiry*

The microalgae cultivation technology patent shall last till 2033, 20 years from 2013. This provides a good number of years to stay ahead of the competition from the first successful cultivation plant.

➤ ***Mechanical & Technical Specifications of Cultivation Plant***

Our Project targets to produce 10 kg of crude microalgae oil per tank per day, which targets to produce approximately 5,400 MT (approximately 40,000 barrels) of crude microalgae oil per year from 1,500 tanks. Continuous tests have been carried out since early 2016 and the growth rate has been duly proven, taking into considerations the weather conditions.

The harvesting machines are currently still in Korea awaiting delivery to Malaysia. The Company requires the necessary additional funding before it can have the harvesting machines delivered to Malaysia. The harvesting machine is fully automated, fitted with sensors and control units to perform harvesting of 24 tanks at approximately every one and a half minutes. The current site is able to accommodate a maximum of 2,400 tanks, which we expect the harvesting machine to harvest all of them within three hours each day. Harvesting is expected every day, unless facing adverse weather conditions. The multiple functions of the harvesting machine is critical to the successful management of the cultivation plant. Oil processing tests have also been carried out in laboratory environment and oil yield have been duly proven to be on average 50%.

➤ ***Yields Per Hectare Per Year***

"Riggs Eckelberry, CEO of Origin Oil (OOIL.OB) commented: "Intensive industrial algae production may yield between 50-100,000 gals per hectare per year. These are not validated numbers, but they are more realistic than the numbers stated [by BARD]."

Source: <https://www.greentechmedia.com/articles/read/8571428-gallons-of-algae-oil-per-acre>

100,000 gallons per hectare converts to approximately 400 MT per hectare. Based on Magnus' Project technical projection, we are projecting to produce approximately 5,000 MT of crude microalgae oil in two hectares, thus approximately 2,500 MT per hectare per year. This number outperformed all other projections, thus begging the question on the realistic projection. This doubt has been duly clarified and satisfied by the nursery plant setup by Mr Kim that the microalgae grows on an average of 100% each day in each tank on a sunny day, with the average 50% lipid content, since early 2016. Also refer to above section "Mechanical & Technical Specifications of Cultivation Plant".

RESPONSE TO SGX-ST'S QUERIES

Two sets of data from different sources have been provided as comparison and referencing on the expected yield:

Gallons Of Oil Per Acre Per Year (Conversion into metric ton per hectare by Company)

Type of Crop	Gallons/Acre/Year	MT/Hectare/Year
Corn	18	0.18
Soybeans	48	0.49
Safflower	83	0.84
Sunflower	102	1.03
Rapeseed	127	1.28
Oil Palm	635	6.42
Microalgae	5,000-15,000	50.55-151.65

Source: <http://www.oilgae.com/algae/oil/yield/yield.html>

Litres Of Oil Per Hectare Per Year (Conversion into metric ton per hectare by Company)

Type of Crop	Litres/Hectare/Year	MT/Hectare/Year
Soybeans	450	0.45
Camelina	560	0.56
Sunflower	955	0.96
Jatropha	1,890	1.89
Oil Palm	5,940	5.94
Microalgae	3,800-50,800	3.80-50.8

Source: Task39.org. (2017). IEA Bioenergy Task 39 – Commercializing Liquid Biofuels, Report in 2010.

➤ **Mr Kim's Resume**

Graduated from George Mason University (USA), Chemistry major

2012 – Present Algae Farm Engineering SDN BHD, Malaysia (Founder and C.E.O)

- Set up Algae Lab to test on Tropical climate
- Produce nutrition for Algae
- Marketing on Algae technology

2002 – Present TAC Corp., Korea (Founder and C.E.O)

- Set up Algae pilot commercial plant in Korea & Japan
- Import and trade petroleum products
- Government licensed in importation of petroleum

2007 – 2008 Dream Energy Inc., Korea (Founder and C.E.O)

- Launched first bio-diesel distributor in domestic market
- Created sales from US\$0 to US\$2 million per month
- Constructed oil distribution hub with storage tank and lorries

2002 – 2007 Next Oil Co., Ltd, Korea (Co-founder and C.T.O)

- Constructed 300ton/day bio-diesel production plant
- Managed acquiring government license
- Managed foreign investment and sales

2001 – 2002 Bizel Co., Ltd, Korea (Co-founder and C.T.O)

- Constructed 20ton/day bio-diesel production plant
- Acquired investment from Goldman Sachs

RESPONSE TO SGX-ST'S QUERIES

1991 – 1998 Expert Equipment Corp., USA (Founder and C.E.O)

- Engineering company
- Constructed chemical, bio-diesel plants

➤ **Mr Kim's Patents**

The patents that are key to the Project are;

1. Harvesting Technology
2. Cultivation Tank Technology

The patents are duly registered in Korea and under Mr Kim himself. The same patents have been registered in Malaysia and awaiting approval from the relevant authorities. Magnus has on 22 June 2016 entered into an agreement with Mr Kim for the use of the patents. This is a non-exclusive use.

The demand for the Crude Oil is in the millions of metric tonnes such that Magnus is unable to obtain an exclusive use of his patents at this juncture. Nevertheless, Magnus has in our forward plan to obtain such exclusivity under the scenario that Magnus is able to bring the following to fruition;

- a. Expand the cultivation project to a much larger scale, that is 100,000 tanks to 1 million tanks;
- b. Offer Magnus shares to Mr Kim; and
- c. To invite Mr Kim to be part of Magnus Management Team.

Only under such conditions and circumstances, Magnus may then be able to negotiate with Mr Kim for the exclusive use of his patents and possibility to have the patent fully transferred to Magnus.

Recently, Mr Kim has represented to Magnus that AFE is currently negotiating with a major oil and gas player in Indonesia to start a cultivation plant in Indonesia. The major oil and gas player's aim is to supply sufficient oil to each island so that power generation can be achieved in each island. This would considerably save the major oil and gas player huge amount of logistics costs and provide solutions to the electricity supply in Indonesia. Assuming the said agreement is inked, the first batch of microalgae cultures has to come from Magnus, as AFE does not have sufficient cultures to supply to the major oil and gas player.

This will immediately provide another source of revenue to Magnus, which is sale of microalgae cultures, in addition to crude microalgae oil production.

➤ **Global Competitors in Mass Production**

Generally, companies have failed to produce sufficient crude algae oil and eventually evolved into supplying its algae produce for production of medical, nutraceutical, cosmetics, food, etc.

a) Sapphire Energy, New Mexico

Notably is Sapphire Energy that has its plant in New Mexico where "It's a different day at Sapphire, as the company has recently followed Solazyme (www.solazymeindustrials.com and terravia.com) and others from a focus on algae biofuels to a portfolio approach including algal oils for nutraceutical applications, protein and fuel."

Source: <http://www.biofuelsdigest.com/bdigest/2015/02/11/sapphire-energy-biofuels-digests-2015-5-minute-guide/>

RESPONSE TO SGX-ST'S QUERIES

b) Euglena Co Ltd, Yokohama

Euglena Co Ltd (www.euglena.jp) is a company valued at almost US\$1 billion in the Toyko Stock exchange. "The company is aiming to produce 33,000 gallons of jet fuel a year from Japan's first algae biofuel refinery, partnering with top Japanese airline ANA (ALNPY). "Everyone says it's crazy the first time they hear the idea," said Euglena's founder, Mitsuru Izumo. But "in terms of science and technology ... it's a very simple idea," he added. Euglena, which shares its name with the algae its business relies on, is building a test facility in Yokohama, near one of Tokyo's two main airports. It's expected to pump out five barrels of "green crude" a day after it comes online next year."

Source: <http://money.cnn.com/2017/03/24/technology/japan-algae-euglena/>

c) Global Algae Innovations, Hawaii

Dave Hazlebeck, CEO of Global Algae Innovations, gave Seeker a tour of his algae farm in Kauai, Hawaii, and explained how his company is revolutionizing sustainable energy. "The fuel that we're producing is exactly the same in terms of performance as gasoline or diesel or jet, it's just a lot cleaner. I think the big difference is that [with] all the other biofuels, you're growing it and you're just getting biofuel. In this case, for every gallon of biofuel you get 10 pounds of food with it," Hazlebeck said.

"There's studies that show with algae grown to replace animal feed, you could actually solve global warming to a large extent," Hazlebeck told Seeker.

Source: <https://www.seeker.com/how-algae-could-change-the-fossil-fuel-industry-2022553403.html>

The different cultivation methodologies has its pros and cons which results in the failures to mass produce crude algae oil. We wish to reiterate that none of these have been setup in a near equator location. Climate remains the key deciding factor on the success of every type of crop. https://en.wikipedia.org/wiki/Algae_fuel provides a good summary of the current cultivation methodologies.

➤ **Notable Project by Exxon Mobil since 2009**

"We think our work with algae offers some of the greatest promise for next-generation biofuels, which is why ExxonMobil has committed hundreds of millions of dollars to algae research....."

Source: <https://energyfactor.exxonmobil.com/perspectives/exxonmobils-advanced-biofuels-research/>

"Our advanced biofuels research portfolio includes joint research collaborations focused on algae-based biofuels with Synthetic Genomics, Inc. (SGI), Colorado School of Mines and Michigan State. We are also exploring a variety of biomass conversion processes that could be used with non-food based feedstocks such as whole cellulosic biomass, algae feedstocks and cellulose-derived sugars."

Source: <http://corporate.exxonmobil.com/en/energy/research-and-development/advanced-biofuels/advanced-biofuels-overview>

"ExxonMobil has been partnering with a company called Synthetic Genomics on algae biofuel research since 2009. The first iteration of the co-funding agreement included a commercialization component, but in 2013 the agreement was re-upped to focus on foundational research."

Sources: <https://cleantechnica.com/2017/02/27/exxonmobil-touts-clean-energy-tackle-climate-change-gives-coal-burns-rush/>

"Scientists from Synthetic Genomics, Inc. (SGI) and ExxonMobil have developed a strain of algae able to convert carbon into a record amount of energy-rich fat, which can then be processed into biodiesel."

Source: https://energyfactor.exxonmobil.com/science-technology/fat-fit-algae-biofuel/?utm_source=Newsletter&utm_medium=Email&utm_campaign=Algae_Edition

RESPONSE TO SGX-ST'S QUERIES

Market & Demand

Consumption:

Alternative/Food Base Production

Alternative/Food Based Source	World Production (2016) in MT
Algae Oil	No record
Rapeseed Oil	26.8 million
Palm Oil	64.5 million
Soybean Oil	53.6 million
Sunflower Oil	16.7 million

Source: www.indexmundi.com
(tabulated by Company)

US Navy on Alternative Fuels

- *"Secretary of the Navy Ray Mabus' energy vision came to fruition in September when the EA-18G "Green Growler" completed flight testing of a 100-percent advanced biofuel at Naval Air Station Patuxent River, Maryland. The U.S. Navy is a leader in incorporating alternative fuel into operational supplies, in order to increase mission capability and flexibility."*

Source: http://www.navy.mil/submit/display.asp?story_id=96702

- *Energy is critical to the Department of the Navy's (DoN) ability to provide the global presence necessary to ensure stability, deter potential adversaries, and present options in times of crisis – wherever and whenever they might arise. In 2009, Secretary of the Navy Ray Mabus issued five aggressive goals aimed at transforming the DoN's energy use. [See "Increase Alternative Energy Use DoN-Wide" and "Great Green Fleet"].*

Source: <http://greenfleet.dodlive.mil/energy/#GGF>

Based on the above, it appears that the navy of various countries may be a potential customer of such technology.

Biofuel For Aviation Industry - Jet Fuel

Airlines are rapidly increasing the use of biofuels for their carriers in the recent years. Just this May 2017, Singapore Airlines (SIA) has launched its first flight powered by sustainable biofuels in a joint press release with the Civil Aviation Authority of Singapore (CAAS). In January 2017, Hong Kong's Cathay Pacific announced its plans to switch to biofuels.

- *Jet fuel consumption in 2012 was approximately 5.4 million barrels per day, which is corresponded by almost equal amount of jet fuel production. This translate to approximately 266 million MT of jet fuel consumed in 2012.*

Sources:

<http://www.indexmundi.com/energy/?product=jet-fuel&graph=consumption>

<http://www.indexmundi.com/energy/?product=jet-fuel&graph=production>

- *"Cathay Pacific Airways has pledged an 80 per cent cut in the amount of climate-changing gases some of its longest flights pump into the Earth's atmosphere, by betting big on biofuels."*

Source: <http://www.scmp.com/news/hong-kong/health-environment/article/2066549/hong-kongs-cathay-pacific-seeks-80pc-emissions>

RESPONSE TO SGX-ST'S QUERIES

- “Flag carrier Singapore Airlines (SIA) has launched its first flight powered by sustainable biofuels, the airline said in a joint press release with the Civil Aviation Authority of Singapore (CAAS) on Wednesday (May 3).”

Source: <http://www.channelnewsasia.com/news/singapore/singapore-airlines-launches-biofuel-powered-flights-8813364>

The above consumption of respective fuels are indicative of the volume that we may expect in the ever increasing pattern of consumption. These have not included the issues and demands for heating oil, electricity production, other uses of renewable fuels, legislative measures on the restrictions on fossil fuels, etc.

➤ **Legal Regulations**

Reduction & Restriction on Food Based Biofuel

“The current 2020 framework sets a EU 20% target for energy consumption which relies on legally binding national targets until 2020. National Renewable Energy Action Plans and the biennial monitoring provided for by the Directive 2009/28/EC on the promotion of the use of energy from renewable sources have been effective in promoting transparency for investors and other economic operators and thereby favoured the rapid deployment increase in the share of renewables from 10.4% in 2007 to 17% in 2015.”

“In its Strategy on Low Emission Mobility the Commission indicated that food-based biofuels have a limited role in decarbonising the transport sector due to the concern about their real contribution to the decarbonisation of the transport sector. In the proposal for the ILUC directive, a precautionary approach was proposed and accepted by the co-legislators limiting the contribution of food-based biofuels to no more 7% by 2020. The regulatory uncertainty surrounding the preparation and negotiation of the ILUC Directive discouraged new investments in this sector beyond what was already in place.

A progressive reduction of food based biofuels and their replacement by more advanced biofuels will realise the potential for decarbonising the transport sector.” [Page 17]

Source: https://ec.europa.eu/energy/sites/ener/files/documents/1_en_act_part1_v7_1.pdf

Policies on Renewable Energy in EU and US

“The [Renewable Energy Directive](#) establishes an overall policy for the production and promotion of energy from renewable sources in the EU. It requires the EU to fulfil at least 20% of its total energy needs with renewables by 2020 – to be achieved through the attainment of individual national targets. All EU countries must also ensure that at least 10% of their transport fuels come from renewable sources by 2020.”

Source: <https://ec.europa.eu/energy/en/topics/renewable-energy/renewable-energy-directive>

“The European Advanced Biofuels Flightpath aims:

- to get sustainably produced biofuels to the market faster, through the construction of advanced biofuels production plants in Europe. The first set of plants are planned to be operational by 2015 or 2016, with the second set operational by 2020;
- to get the aviation industry to use 2 million tonnes of biofuels by 2020”

Source: <https://ec.europa.eu/energy/en/topics/biofuels/biofuels-aviation>

Note the enormously contrasting figures of 2 million MT as compared to the aspiration of Euglena of 33,000 gallons (approximately 100 MT) as stated above. With the reduction of food-based biofuels, an immediate void can be created.

RESPONSE TO SGX-ST'S QUERIES

"The Energy Policy Act (EPA) addresses energy production in the United States, including: (1) energy efficiency; (2) renewable energy; (3) oil and gas; (4) coal; (5) Tribal energy; (6) nuclear matters and security; (7) vehicles and motor fuels, including ethanol; (8) hydrogen; (9) electricity; (10) energy tax incentives; (11) hydropower and geothermal energy; and (12) climate change technology. For example, the Act provides loan guarantees for entities that develop or use innovative technologies that avoid the by-production of greenhouse gases. Another provision of the Act increases the amount of biofuel that must be mixed with gasoline sold in the United States."

Source: <https://www.epa.gov/laws-regulations/summary-energy-policy-act>

Other due diligence, amongst a long list of reading materials and news, of which the few notable ones are as per below:

- a. *Renewable Diesel from Algal Lipids: An Integrated Baseline for Cost, Emissions, and Resource Potential from a Harmonized Model*, Coordinating Authors: Ryan Davis,³ Daniel Fishman,² Edward D. Frank,¹ Mark S. Wigmosta⁴, Contributing Authors: Andy Aden,³ Andre M. Coleman,⁴ Philip T. Pienkos,³ Richard J. Skaggs,⁴ Erik R. Venteris,⁴ Michael Q. Wang¹
- b. *Oils from micro-algae: achievements and prospects* by Colin Ratledge, University of Hull, UK
- c. *Current Status and Potential for Algal Biofuels Production*, A REPORT TO IEA BIOENERGY TASK 39, AUTHORS: Al Darzins (NREL), Philip Pienkos (NREL), Les Edye (BioIndustry Partners)
- d. *Australian Report*, concise report
- e. *European Commission Directives on future mandatory demand of renewable oil*
- f. Others such as website search, <http://www.smh.com.au/technology/sci-tech/hope-for-algaepowered-future-20130801-2r37m.html>

SGX-ST Query 2

Who introduced this deal to the Company?

Company's response

In 2015, Magnus attempted to trade crude palm oil fruits in Indonesia, by way of filling the gap of logistical arrangements between the mills and small producers of the palm oil fruit in Central Java. In the process of due diligence and meetings with several parties, Magnus was introduced to, amongst many potential business parties, Weschem, in Malaysia. Weschem is a manufacturer and exporter of eco-friendly industrial chemicals using renewable and sustainable raw materials, such as palm oil products. A business opportunity arose when Weschem introduced Magnus to finance and trade a batch of crude palm oil with AFE to deliver crude palm oil to a Korean renewable power source producer.

At the same time, Magnus was presented with the opportunity of investing in the microalgae cultivation plant in early 2015. Magnus has rejected the proposal as the project feasibility has not been proven in Malaysia.

In early 2016, AFE completed its nursery plant and has successfully proven the growth of the microalgae in Weschem's compound in Selangor, Malaysia, given the current conditions and climate. Magnus had revisited Weschem and studied the cultivation process and physically sighted the cultivation process and demonstration of the use of the Crude Oil functioning in a diesel generator.

Between the first encounter and June 2016, due diligence had been carried out to study the pros and cons of microalgae and the possible enormous demand in the foreseeable future.

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RESPONSE TO SGX-ST'S QUERIES

If Magnus can be successful in its endeavour in the microalgae cultivation, this could potentially turn Magnus into a highly profitable company. Risk and rewards have been duly considered, thus the ultimate decision to invest a relatively substantial sum into this new energy business.

SGX-ST Query 3

Are there any successful track record of Mr Kim and his technology? If so, please provide information.

Company's response

Over the past 15 years and counting, Mr Kim has been studying the behavioural aspects of, amongst others, the strain of microalgae, which shall be cultivated in this Project.

For the successful cultivation and harvesting, studies have been made in the following:

- *Climate and weather conditions*
- *Growth rates, habits and conditions*
- *Lipid content control*
- *Nutrient applications and control*
- *Harvesting methodology*
- *Suitable location and site*
- *On site logistical methodology*
- *Crude Oil extraction process and methodology*

Research and development plants have been setup in Korea under TAC Corp, Korea:

- *Yang Ju, northern part of Seoul, 100 tanks, growing at minus 20 degrees Celsius*
- *Bo Eun, southern Korea, 50 tanks, above zero degrees Celsius*

Subsequently, a Japanese Investor has invested in a 2,000 tanks cultivation plant, that uses the harvesting machine, for harvesting of algae oil for nutraceutical products;

- a) *TAC Corp, Japan, Kumagaya, 50 tanks, manual harvesting*
- b) *TAC Corp, Japan, Nagoya, 2,000 tanks, Harvesting Machine Version 2 (harvesting 4 tanks at one time)*

Mr Kim is currently the consultant of Algae Science Japan (www.algae-science.jp), which is the spin-off of TAC Corp Japan, which owns half of the 2,000 tanks as stated above. Algae Science is an R&D company for algae biofuel, planning for launching plant for algae biofuel, produce, sourcing and selling for products related to plant for algae biofuel, produce and selling for algae biofuel and consulting for integrated rural development, social development and environmental development.

SGX-ST Query 4

Is TAC Japan and/or Algae Science already mass producing algae biofuel for sale now? What are their respective profits / loss recorded for the last 3 years?

Company's response

No, both companies are not into mass production. We do not have access to their financial statements, however, we believe that they are profitable since they are still operating. Nevertheless, Algae Science is engaged in an entirely different scope of operations, thus not a suitable benchmark for comparison. Both Algae Science and TAC Corp Japan are not into mass Crude Oil production and both are not operating in a near equator climate. Magnus is targeting to mass produce the Crude Oil while the Japanese companies are very much into nutraceutical products, R&D and consultancy.

RESPONSE TO SGX-ST'S QUERIES

SGX-ST Query 5

We note from Magnus' announcement of 22 June 2016 that the cultivation patent was filed on 22 Sept 2014 in Malaysia with the Intellectual Property Corporation of Malaysia under number PI 2014002704 and is currently awaiting the grant of the patent.

- (a) Without this patent, what would be the impact to the microalgae oil cultivation business? Please set out in details.
- (b) We further note this same patent PI 2014002704 was also featured in the announcement by another listed company listed on the Singapore Exchange Securities Trading Limited (the "SGX-ST"). Can 2 parties share the use of 1 patent?

Company's response

The patent registered is for the tank and harvesting machine. There is very little concern whether this shall be eventually approved as this pertains mainly to hardware designs. Without the confidential know-how on the cultivation methodology, copycats will not be able to successfully use the same hardware. The grant for use of Mr Kim's patent is entirely up to him, and at this juncture, is without restrictions. The Company does not have a lock in agreement with Mr Kim that states any restrictions nor prohibitions.

SGX-ST Query 6

Can you confirm that the outstanding patent application with the Intellectual Property Corporation ("IPC") of Malaysia has no (direct / indirect) impact on Magnus' microalgae cultivation operations i.e. Magnus' microalgae cultivation operations can proceed to use the machines without the grant of the patent? By doing so, is there any legal implications?

Company's response

Yes, we confirm that the outstanding patent application with the Intellectual Property Corporation of Malaysia has no impact on Magnus' microalgae cultivation operations and there will be no legal implication.

SGX-ST Query 7

Can you confirm that the patent can be used by other companies and Magnus concurrently?

Company's response

We confirm that the patent can be used by Magnus. Kindly note that the use of the same patent by other companies can be duly granted by Mr Kim as we do not have an exclusive agreement with Mr Kim.

SGX-ST Query 8

In the Company's announcement of 22 June 2016 [page 8, para 8(c)], it was stated that "The Cultivation Patent, as stated in item 2(a) above, that has been granted shall be valid till about year 2033." Does it mean granted by Mr. Kim? Is this independent of the outstanding patent application with the Intellectual Property Corporation of Malaysia?

Company's response

Yes, it is granted by Mr Kim to Magnus for the use of patent. The patent has been approved and registered in Korea and Mr Kim sought to have the same patent to be registered in Malaysia thus the pending application. The use of patent is independent of the outstanding patent application with the IPC of Malaysia.

RESPONSE TO SGX-ST'S QUERIES

SGX-ST Query 9

We also noted that Mr Kim is also working with other companies listed on the SGX-ST on microalgae oil cultivation and those other companies did not made significant progress since it was first announced by them in September 2015. Looking at the development of their projects, how did the Board of Magnus satisfy itself that participating in this project is in the best interest of the Company and shareholders?

Company's response

We have encountered other listed companies listed on the SGX-ST that have attempted to collaborate with the business and initiatives of Mr Kim, and have proven to fail or did not take off at all. Our discussion with Mr Kim has concluded that project funding was the main cause of failures in those other companies. For example, for one company, the shortfall of funding for the project resulted in a build-up of a power plant that was of less capacity than targeted, causing cost overruns resulting in the existing project status. For another company, the project funding was not to AFE but to another party that Mr Kim agreed to work with. Mr Kim had also provided a letter of termination of his collaborations with the said party. The project did not take off. The Company wishes to note that we have not made any contact with any representatives of those other listed companies to verify the above representations by Mr Kim.

The Board has reviewed, inter alia, the financial position of the Group which is the financial ability to see through the project till completion, the financial due diligence on the expected profitability of the project, the information derived from the operational due diligence on the expected operational efficiency of the project and the scalability of the project for future growth of the Group, and is satisfied that participating in this project is in the best interest of the Company and shareholders.

SGX-ST Query 10

Have the Board of Magnus taken into account the outcomes of the other SGX-ST listed companies who had ventured into this business opportunity? Why is the Board confident that their venture would not turn out to be like the other SGX-ST listed companies?

Company's response

Yes. The Company is dealing directly with Mr Kim himself. The Company is confident that we will be able to raise sufficient funds in due course to complete the project. Kindly also refer to the pictures of the development of the Company's Project set out under Query 13 below.

SGX-ST Query 11

Microalgae oil cultivation is an investment that requires high upfront investment costs. How does Magnus intend to obtain its funding?

Company's response

The Company is able to finance the project through internal funds and from existing Notes Issue program.

SGX-ST Query 12

What is the current project budget of the microalgae investment? Based on the capacity of plant built using the current project budget, how long does it take for Magnus to breakeven?

Company's response

The current budget is US\$12.75m. Based on the capex and expected capacity, the Company expects to break even in four years.

RESPONSE TO SGX-ST'S QUERIES

SGX-ST Query 13

Given the present technology, would this be a commercially viable source of renewable energy?

Company's response

Yes, algae oil is a renewable oil, subject to the ability of companies to produce the said oil in huge volume and low cost. Our design and technology shall enable us to produce the said oil at low cost.

The Company looks forward to its completion of the construction of the site in Malaysia as proof of the Company's ability to mass produce the said oil.

Kindly refer to some photographs of the Plant in Malaysia:



Soil tests



Running tracks



Cultivation tanks



CO₂ pipes

RESPONSE TO SGX-ST'S QUERIES



Samples derived at the Plant

Current Progress and Immediate Plans of the Project

The progress of the civil works has been met with delays mainly due to rainy weather and funding issues. In April 2017, funds have been paid to AFE to carry out the completion of the civil works and the site is currently 90% completed.

Specifically, the 500 cultivation tanks are currently on the cultivation site. Site offices have also been setup. Utilities supplies are in the connection process.

Administratively, applications have been made to the Malaysian Investment Development Authority ("MIDA") for the partial tax exemptions status. We have had a meeting with the MIDA delegation, who were visited Singapore in conjunction with the Malaysian Trade Minister visit to Singapore on 24 May 2017. We are very encouraged with the level of support that MIDA is providing to our existing plant and future expansion plans.

Magnus is also in the process of application for the International Sustainability & Carbon Certification ("ISCC") (www.iscc-system.org), which is critical before the European countries can provide any offtake agreements to us.

Partial payments have been made for the delivery of the harvesting machine which is expected to arrive on site in Malaysia sometime late July 2017 or beginning of August 2017 due to difficulties in scheduling of shipment for such irregular bulky items. Installation of the harvesting machinery requires approximately 20 days from arrival.

Thus said, the anticipated production stage for 500 tanks of the Project is expected sometime towards the end of August 2017. The remaining 1,000 tanks, as stipulated in this Project, shall be delivered in the first quarter of financial year ending 30 June 2018. If funding is raised in a timely manner, additional 900 tanks shall be ordered to make up a total of 2,400 tanks. Hence, the additional listing of the shares under convertible notes is critical for the Company for sufficient funding to be raised in a timely manner.

➤ **Biofuel Refinery in Germany**

A company in Germany has conducted tests on our samples and are satisfied to provide an offtake agreement subject to Magnus obtaining the ISCC. Upon the completion of the ISCC certification, we would proceed to discuss the details of the offtake agreement with them. This organisation has a gross turnover of Euro 91 billion in 2016, it sources, finances, trades, stores, blends and distributes crude oil and refined petroleum products. They focus on fuel oil, diesel, heating oil, jet fuel, kerosene, gasoline, natural gas, biofuel, vegetable oils, and coal. They market their products worldwide.

RESPONSE TO SGX-ST'S QUERIES

➤ **EU Grant Application**

The Company has delivered 5 litres of sample to a company in Europe. The company in Europe is a highly accredited science laboratory and has as a mission the generation of knowledge of high technological value to give support to the industries in the life sciences field. The sample was sent for testing and preparation, amongst others, for the application of EU Grant. The initial tests, targeted to derive the European standard biodiesel, yielded good results on a Nissan Qashqai diesel engine and we are following closely with the progress.

➤ **Refinery in Portugal**

Upon the completion and positive results on the above tests, a refinery company in Portugal will be keen to negotiate for an offtake agreement with Magnus. The refinery company has activities that span from exploration and production of oil and natural gas to refining and marketing oil products, natural gas marketing and sales and power generation. The said company has an approximate market capitalisation of Euro 12 billion.

➤ **Refinery in United Kingdom**

Another privately owned refinery that has the capability of 145 million litres per year, is willing to provide an offtake agreement for our crude algae oil subject to their test on our sample. We have not sent our sample to them as of now. We wish to conclude our ISCC certification and offtake agreement with the German company first.

Immediate Plan & Future Expansion

The existing cash flow of Magnus Group has met approximately 62% (approximately US\$8.0 million) of the Project budget. Balance of approximately US\$4.8 million shall be paid from the funds to be raised from the Notes Issue Program and/or internally sourced funds. On the back of a successful cultivation plant, certain banks have expressed their willingness to provide debt funding which Magnus will actively pursue for rapid expansion. Hence, the additional listing of the shares under convertible notes is critical for the Company to proceed with the fabrication processes and for delivery of the remaining harvesting machines.

On the condition that the Project is deemed successful, Magnus intends to immediately expand our cultivation plant from its initial projected capacity of 1,500 tanks to 2,400 tanks. This shall increase annual production from approximately 5,400 MT to 8,700 MT, which will increase the expected gross profits from US\$3.5 million to approximately in excess of US\$5 million. Currently, there are 500 cultivation tanks that are on the cultivation site.

Discussions have been carried out with the abovementioned refineries which intends to provide an offtake of at least 20,000 MT per annum each. This can only be satisfied by expanding our existing cultivation plant by six times or to 14,400 tanks. The expected profits from this offtake would be in excess of US\$20 million. The existing cultivation site has unoccupied adjacent land, which Magnus is planning to contact the respective landlords for leasing, for future needs. MIDA has also expressed their willingness to help us source viable land for our projects.

As noted under the Market & Demand/US Navy on Alternative Fuel section, the Chairman of a company in Spain has immediate plans to contact the US Navy in the Philippines to build a microalgae plant to satisfy their need for alternative fuel.

MAGNUS ENERGY GROUP LTD.

(Incorporated in Singapore)

(Registration No. 198301375M)

RESPONSE TO SGX-ST'S QUERIES

Our future growth plans include acquisition of a reputable science laboratory, for vertical/downstream integration and expanding to related fields such as acquisition of refineries.

Pursuant to the abovementioned, the completion of the Notes Issue Program and the additional listing of the shares under convertible notes are critical to the Project and expansion funding. Nevertheless, Magnus shall also explore debt funding from banks.

The Company will keep shareholders updated of any material updates and developments of the Project via announcements on the SGXNET.

BY ORDER OF THE BOARD

Magnus Energy Group Ltd.

Luke Ho Khee Yong
Chief Executive Officer
17 July 2017

About Magnus Energy Group Ltd. (www.magnusenergy.com.sg)

Listed since 04 August 1999

Incorporated in 1983, SGX Catalist Board-listed Magnus Energy Group Ltd. ("**Magnus**") is an investment holding company with a diversified portfolio comprising oil, coal and gas assets, oil and gas equipment distribution, renewable energy and natural resources trading, property and infrastructure development, and industrial waste water treatment.

Magnus aims to maximise shareholder value through strategic investments in profitable projects and acquisitions globally with the goal of broadening the Group's earnings base and shareholder value.

*This announcement has been prepared by the Company and its contents have been reviewed by the Company's sponsor, Stamford Corporate Services Pte. Ltd. (the "**Sponsor**"), for compliance with the relevant rules of the Singapore Exchange Securities Trading Limited (the "**SGX-ST**"). The Sponsor has not independently verified the contents of this announcement.*

The announcement has not been examined or approved by the SGX-ST and the SGX-ST assumes no responsibility for the contents of this announcement including the correctness of any of the statements or opinions made or reports contained in this announcement.

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