Next Gen Oil

Powered by Algae

COMPANY & BUSINESS PROFILE

'LONG TERM & STABLE SUPPLY OF LOW COST ALGAE CRUDE- BIODIESEL OIL FOR POWER GENERATION & JET FUEL, NOW A REALITY '

Profile write up on Next Generation Oil Sdn Bhd ("NGOSB")

NGOSB is a game changing engineering company which has successfully developed a patented commercially & economically viable system using Algae Modular Automated Plantations ("A-MAP") engineering & processing improvements, to cultivate & produce algae biomass in large quantities on daily basis. The algae biomass produced under A-MAP has a large algae crude oil content extraction rate of more than 50% derived from the algae biomass produce. NGOSB, which owns the patents to A-MAP is incorporated in Singapore (wholly owned by Peter Kim Jae Hoon) and is a holding company with the main purpose of operating as the worldwide patent holder and owner as well as to licence out its 'one of a kind' A-MAP intellectual patent technology (IP) on this advanced algae farm engineering cultivation. *Full details on A-MAP engineering & processing systems is explained under* ***the Appendice****.*

NGOSB works with each of the related/unrelated operator companies that it contracts with from any country (with tropical sub-climate location for the algae farm), whereby, NGOSB would then license out it's A-MAP IP for building, engineering and operating the algae cultivation farms that is able to produce high yielding algae biomass, with the algae by-product producing approximately 50% renewable algae oil and 50% algae cake. NGOSB collects from each of the operator companies that it contracts in each/any country yearly royalty fees for the operating companies' usage of the IP and know-how of algae farm and cultivation engineering.

IP Licencing Fee Income

NGOSB generates revenue and income on royalty fees for other operating companies usage of its IP based on fixed price for our modular system of algae industrial farm and cultivation engineering, whereby, each module pays to NGOSB USD 900,000 per year on annual royalty fees.

Operating Income from New Joint Venture(s) in Renewable Algae Fueled Power Generation Plants

NGOSB shall also receive revenues and operating income from being the holding company owner for all regional/worldwide projects and joint venture(s) with any other 3rd parties and investors involving renewable energy power generation plants fueled by algae oil produced daily from our planned algae farm engineering cultivation facilities. The revenues will be generated from power purchase agreements awarded to the joint venture(s).

ALGAE BIOMASS SUMMIT 2019
ORLANDO · FLORIDA · SEPT 16-19

ABOUT | MEMBERSHIP | EVENTS | POLICY CENTER | RES

ALGAE BIOMASS ORGANIZATION
ABO

ALGAE BIOFUEL CAN CUT CO2 EMISSIONS BY UP TO 68 PERCENT COMPARED TO PETROLEUM FUELS FINDS NEW PEER REVIEWED STUDY

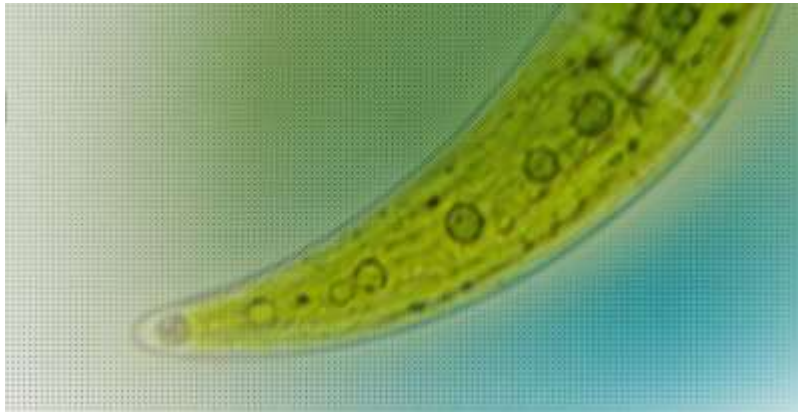
Algae fuel will have a significant energy return on investment, consume waste CO_2 and can be grown in saltwater on marginal lands

MINNEAPOLIS (September 19, 2013) –Algae-derived biofuel can reduce life cycle CO_2 emissions by 50 to 70 percent compared to petroleum fuels, and is approaching a similar Energy Return on Investment (EROI) as conventional petroleum according to a new peer-reviewed paper published in ***Bioresource Technology***. The study, which is the first to analyze real-world data from an existing algae-to-energy demonstration scale farm, shows that the environmental and energy benefits of algae biofuel are at least on par, and likely better, than first generation biofuels.

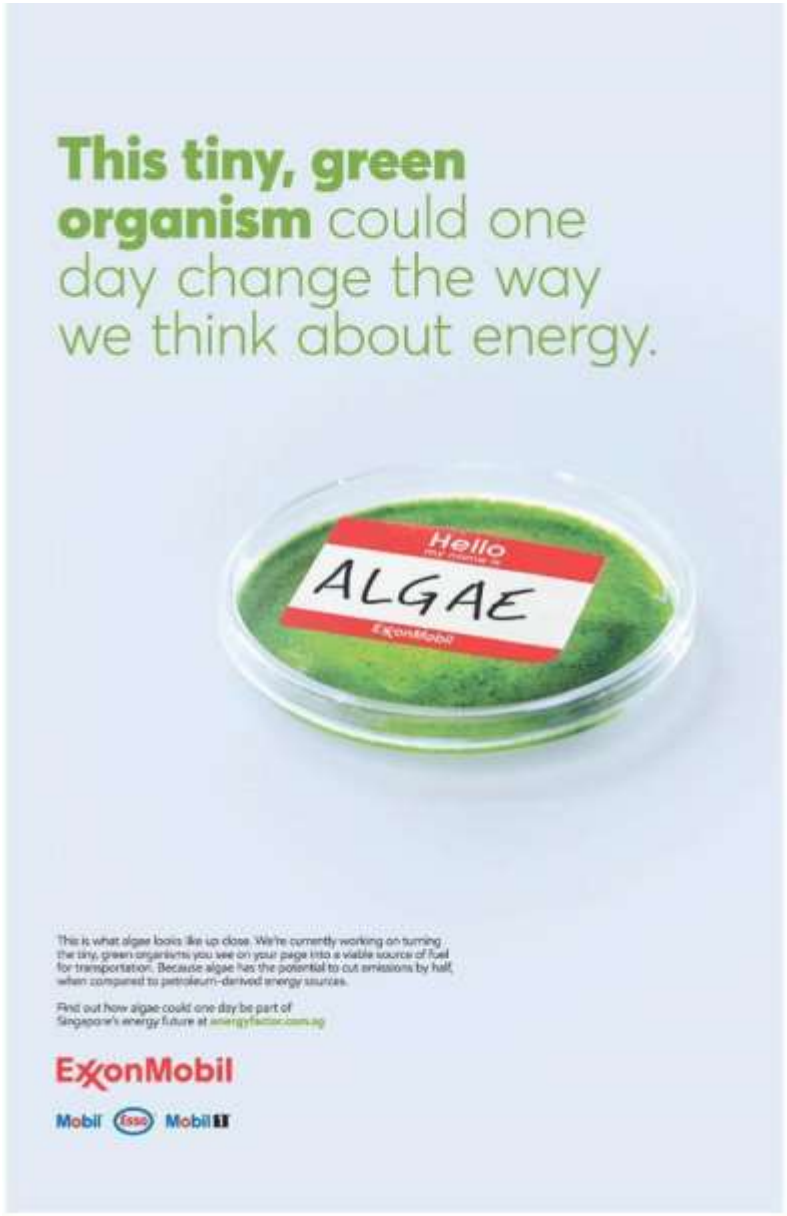
The study, "Pilot-scale data provide enhanced estimates of the life cycle energy and emissions profile of algae biofuels produced via hydrothermal liquefaction (HTL)," is a life cycle analysis of an algae cultivation and fuel production process currently employed at pre-commercial scales. The authors examined field data from two facilities operated by Sapphire Energy in Las Cruces and Columbus, New Mexico that grow and process algae into Green Crude oil. Sapphire Energy's Green Crude can be refined into drop-in fuels such as gasoline, diesel and jet fuel.

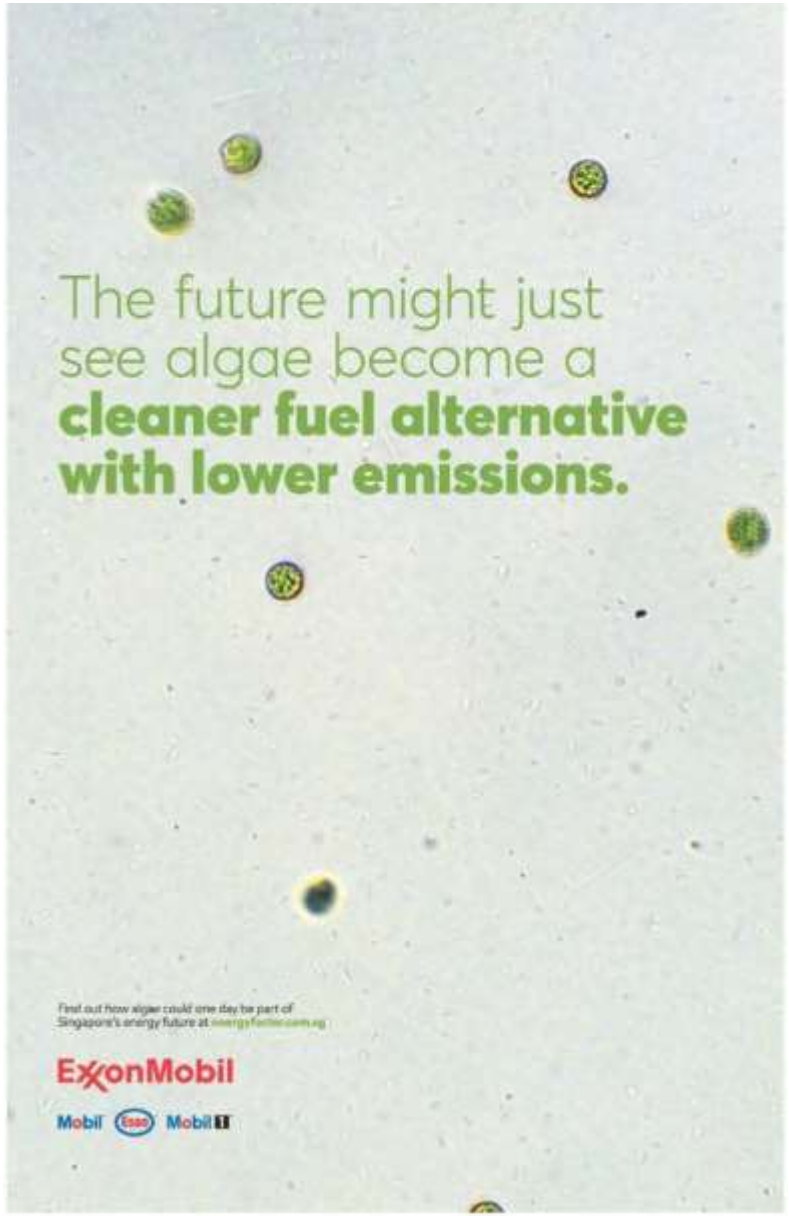
The study concluded that algae technologies at commercial scale are projected to produce biofuels with lower greenhouse gas emissions and EROI values that are comparable to first generation biofuels. Additionally, algae based biofuels produced through this pathway at commercial scale will have a significant energy return on investment (EROI), close to petroleum and three times higher than cellulosic ethanol. The system that was evaluated recycles nutrients, can accept an algae feed that is up to 90 percent water in the processing phase, and the final product can be blended with refinery intermediates for refining into finished gasoline or diesel product, resulting in significant energy savings throughout

The authors also write that expected improvements in the industry mean that algae-based biofuels are set to surpass advanced biofuels such as cellulosic ethanol in terms of both energy returns and greenhouse gas emissions.



2 Full Large Page Advertisements by ExxonMobil in Singapore's major Daily, The New Straits Times in August 2019, shows that NGOSBEnergy is on the Right Track





EXXONMobil has already spent more than US600 mil on their algae production over the past 7 to 8 years and needing to spend another few billion more or so just to achieve **production of 10,000 metric tonne of algae crude oil per day** by 2025…..**NGOSB can achieve production of 10,000 metric of algae oil by next year in 2020 at small fraction of the cost... By 2025 NGOSB is looking at achieving over million tonne of algae oil production per day and even more at fraction of the cost.. We have only spent below USD10 million in last 3 years to get where we are today…..**Our cost is way far below than ExxonMobil or any other algae oil/biofuel/fossil fuel producer in the world and we can achieve mass scale size at a small fraction of oil & gas or palm oil biofuel budgets.. **Think of the 1st Iron Man movie.. when Tony Stark built an Invincible super magic Iron man suit using iron scraps... that's what and where NGOSB is today…..**

https://corporate.exxonmobil.com/research-and-innovation/advanced-biofuels/advanced-biofuels-and-algae-research

Directors

PETER KIM

Chairman & CEO / Founder

BSC in Chemistry and holder of 4 patents in the renewable energy sector. Experience includes engineering and constructing of chemical plants, storage and distribution facilities Pioneer of biofuels and renewable energy in South Korea

ALMI RIZAL

COO / Head, Corporate Finance & Sales

A highly skilled product development specialists with over 15 years in the corporate and investment banking experience, particularly pioneering in Islamic finance and capital markets. He also headed a major leading regional oil & gas integrated services listed company for 6 years

Senior Management

The management team brings extensive experience from the Energy Sector, Renewables, Oil & Gas, Finance and Aquaculture.

Peter Kim , CEO & Founder of A-MAP Technology

- Responsible for leading the team and setting the overall strategy of the business.
- Over 30 years of international business experience, mainly in USA and South Korea, conducting and overseeing R&D programs in the renewable energy sector, with a focus on biofuels.
- Experience includes the engineering and construction of chemical plants, storage and distribution facilities, microalgae cultivation plants and biofuel power plant.
- Built Korea's largest biodiesel refinery with investments from Goldman Sachs in 2000.
- Pioneer in biofuels and renewable energy in South Korea.
- 4 patents to his name in the renewables sector.
- BSc in Chemistry from the George Mason University, Virginia, USA.

Ralph Krattli, Head of Engineering

- 28 Years experience in Power Generation, working part time as a Student with BBC (later called ABB) in Zurich Switzerland, Steam & Gas Turbines and large ship-diesel engines. He is working in Malaysia since 1996.
- Particular expertise is in green technologies, energy conservation and in sustainable, renewable Power Generation. To date has been involved in the Malaysia Solar PV development right from the beginning in 2005 with has built various prestigious and innovative Solar Solutions.
- Founder and Director of Able Energy Sdn. Bhd. since 2001, to develop small Hydro Power Plants and Off Grid Solar Power Solutions. He was a member of the Sirim working committee.
- A swiss national and a graduate of the prestigious Engineering Institute ETH in Zurich.

Mark Sheridan, Head of Finance

- 22 years experience in Finance including Executive Director at UBS, Vice President at Santander and Managing Director at Amur Capital.
- Broad Industry and Country exposure with recent focus on Malaysia. Previously focused on US and Europe.
- Responsible for analysis and presentation of Borrowers, development of Lending facilities and new business development.
- Major Focus on working with first time, non traditional or distressed Borrowers.
- To date has been involved in raising over 30bn USD of funding.
- Irish national who has worked in Ireland, London, New York and Kuala Lumpur.
- University of Limerick, Ireland Graduate in Business and Economics with minor in Financial Services.

Melvin Rohan, Head of CAO

- 21 years experience in oil and gas industry with ExxonMobil, Executive Director for KLSE listed subsidiary company in Malaysia for oil and gas market and Senior Vice President at Amur SME Sdn. Bhd.; a wholly owned subsidiary for New York based investment Amur Finance Company.
- Broad Industry and Country exposure with focus on Malaysia, Indonesia, Thailand, Philippines, Cambodia and Brunei.
- Responsible for business development and incubation programs for start-up and mid tier companies.
- Particular expertise on pairing "disrupting" technologies with cost improvement programs to generate a sustainable recurring income stream.
- University of Deakin, Melbourne Graduate in Commerce with double major in Economic and Marketing.

Sharizal Shaarani, Head of DAC

- 21 years experience in IT and Telecommunications, Sustainable Agriculture and Fintech.
- Particular understanding and expertise in stakeholder management with Government of Malaysia and its agencies.
- Strong entrepreneurial, start-ups and business structuring experience.
- Experience include positions with Khazanah Nasional Berhad and Fortune 500 Company.

REGAIA ENERGY

OTHER TEAM MEMBERS

- Norman Dutton – Business Development Director
- Rizal Adam Hon – Business Development (Europe, USA & China)
- Denny Octave Lefebvre – Branding & Marketing (Global)
- Amin Abedy Nia – Global Sustainable & Growth Advisor

Highlights on Current Large IP Licencing Contracts Todate - *Petronas Contract

NGOSB have been working closely with Petronas for the last several months and we have recently in mid-October 2019 been awarded a new long term algae crude oil supply contract from Petronas for which usage of NGOSB's IP in Malaysia shall serve this Petronas contract for the production and supply of up to 36,000 metric tonnes of algae crude oil per annum to Petronas at fixed price for a fixed contract period of 5 + 2 years. This Petronas contract alone will add 5 modules that translates to total royalty fee revenue of USD 4,500,000 per annum (or total confirmed revenue of USD31,500,000) for the next 7 years for Regaia.

Highlights on IP Licensing Contracts In the Pipeline - 10x times Expansion on the Petronas Contract on 2nd year running of Contract Operations

Right after 1st year of our algae supply production under the Petronas contract, Petronas has in principal already agreed to automatically and immediately accelerate capacity expansion on the algae oil supply contract, i.e. enlarged extension of the existing Petronas contract to 10x times the current contract supply volume on 2nd year operation of the contract, for NGOSB to supply and produce algae crude oil of 360,000 metric tonnes per annum. This will increase the current contract from 5 modules per annum to an enlarged 55 modules annually that shall translate to eventual total royalty fee revenue increasing from USD4,500,000 per annum to USD45,000,000 annually (or total increased revenue to USD315,000,000 for the further next 7 years thereafter) for Regaia.

NEXT GENERATION OIL has recently signed an MOU with HANHWA CORPORATION (South Korea's Top 8 Biggest Construction Group & a Global Fortune 500 listed company) to undertake all EPCC works on our Algae Projects

M. O. U

(Memorandum Of Understanding)

This Memorandum of Understanding (hereinafter referred to as "MOU") is made and entered into by and between the **NEXT GENERATION OIL SDN BHD** (hereinafter referred to as **"NGOSB"**), whose address is E-130A-05, Plaza Mont Kiara No.2, Jalan Kiara 50480 Kuala Lumpur, Malaysia and **HANWHA CORP., Ltd./MACHINERY DIVISION** (hereinafter referred to as **"HANWHA"**), whose address is 86, Cheonggyecheon-ro, Jung-gu, Seoul, Republic of Korea.

Article 1 (Purpose)

The purpose of this MOU is to combine the know-how and infrastructure of both parties, "NGOSB" and "HANWHA," in a mutually effective manner and to establish cooperation between the parties in order to successfully perform the "Project" specified in Article 2 of this MOU, and to ensure mutual benefits by faithfully observing them.

제 1 조 (목적)

이 합의서의 목적은 "NGOSB"와 "HANWHA" 양 당사자의 노하우와 인프라를 상호 효과적으로 결합하며, 본 합의서 제 2조에 명시된 "프로젝트"를 성공적으로 수행하기 위하여 양 당사자의 협력사항을 정하고 상호 협조와 신뢰로써 이를 성실히 준수하여 상호간의 이익을 도모하는 데 있다.

Article 2 (Project)

"NGOSB" and "HANWHA" will cooperate under this MOU to support the following micro algae oil based renewable power plant projects

- Micro algae bio-oil renewable power plants (New or Retro-Fit power plant projects).
- Micro algae bio-oil cultivation and production facilities for Micro algae bio-oil power plant

제 2 조 (프로젝트)

"NGOSB"와 "HANWHA"는 다음의 미세조류 바이오오일 기반 신재생 발전 프로젝트를 지원하기 위해 이 합의서에 따라 협력하기로 한다.

- 미세조류 바이오 오일 신재생 발전소 (신규 또는 Retro-Fit)
- 위 미세조류 바이오 오일 신재생 발전소를 위한 미세조류 바이오 오일의 재배 및 생산 시설

Article 3 Responsibilities of NGOSB

- Provide and share methods and Know-how of cultivation & production facilities of micro algae
- Develop micro algae bio oil renewable power plant project

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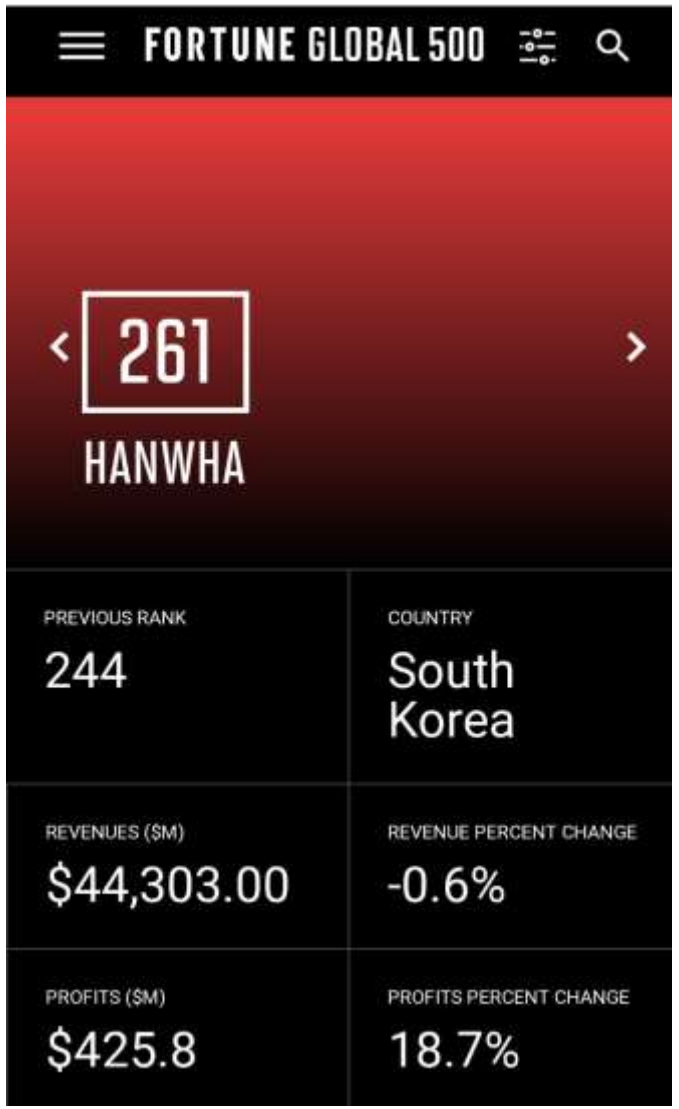

Article 11 (Notification Obligations)

Each party shall notify in writing of any proceedings, changes, occurrences, bids or business announcements relating to the "project", or any other reason necessary to notify the other party during the execution of this MOU.

제 11조 (통지의무)

각 당사자는 이 합의서를 이행하는 동안 본 프로젝트와 관련하여 주요입무, 제안 진행사항, 변동사항 등에 대해 상대방의 인지가 필요하다고 판단되는 모든 내용에 대해 즉시 사유를 명시하여 서면으로 통지해야 한다.

Article 12. Applicable Law

The construction, interpretation and enforcement of this MOU shall be governed by the laws of the Republic of Korea. The courts of the Korea shall have jurisdiction over any action arising out of this MOU and over the parties.

제12조(준거법)

이 합의서의 구성, 해석 및 집행은 대한민국 법에 의해 규정된다. 대한민국 법원은 본 합의서 및 당사자에 대하여 발생하는 모든 소송에 대하여 관할권을 가진다.

"NGOSB" and "HANWHA" agree to perform all of the provisions set forth in this MOU. Two copies of this MOU shall be completed, signed, or affixed to each other in writing.

"NGOSB"와"HANWHA"는 이 합의서에 규정된 모든 조항을 이행할 것을 합의하고 이 합의서 2부를 작성하여 서명, 또는 기명 날인한 후 각 1부씩 소지하여 보관한다.

September 18, 2019

2019년 9월 18일

NEXT GENERATION OIL SDN BHD

Name : **Jae Hoon, Kim**

Job Title : **Chairman**

HANWHA CORP., Ltd. /MACHINERY DIVISION

Name : **Youn Chul, Kim**

Job Title : **President**

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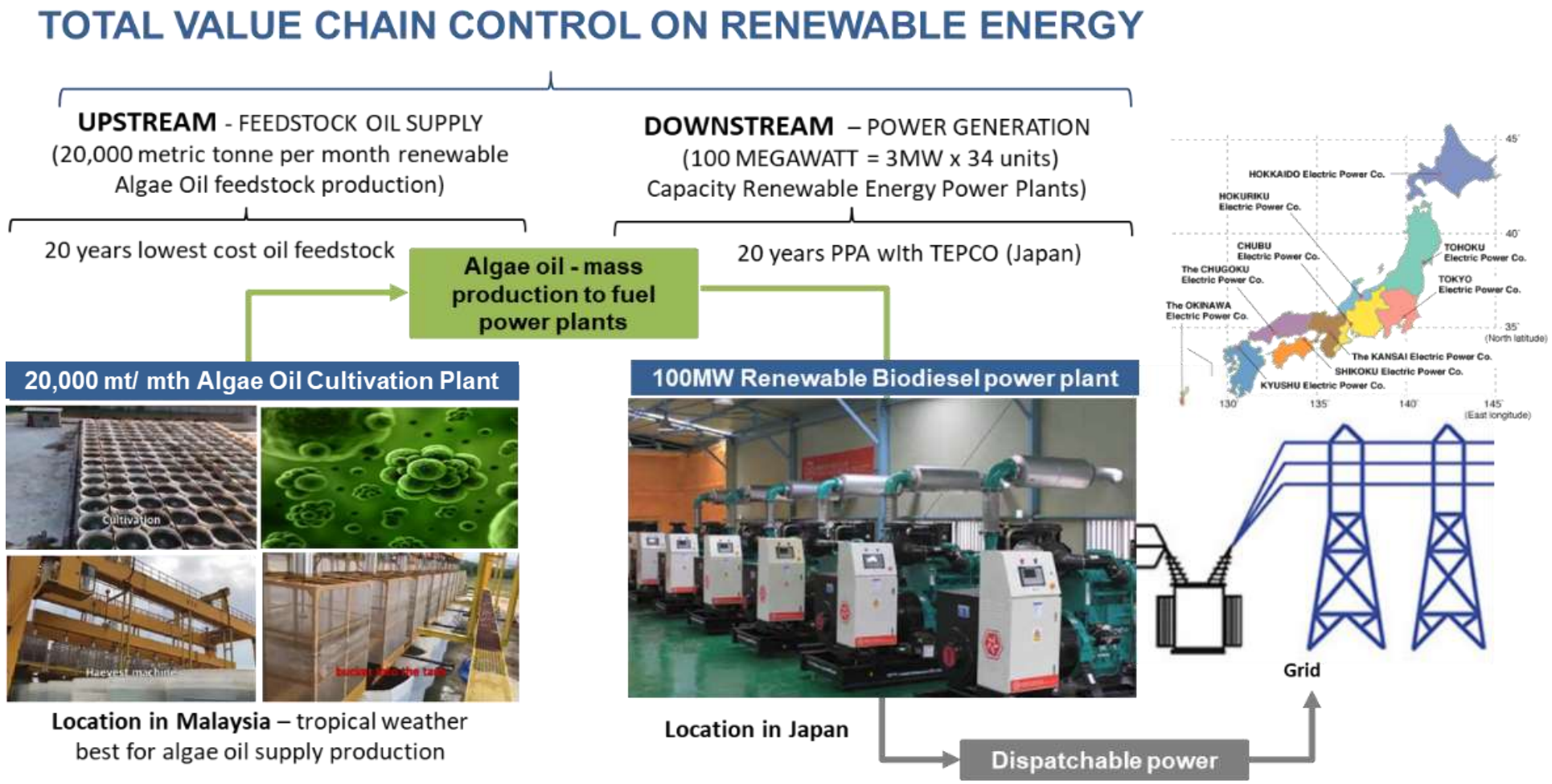
<u>Other Highlights on IP Licensing Contracts</u> <u>In the Pipeline- Large IP Licencing Contract for 100MW Japan Renewable IPP project</u>

NGOSB is also in the midst of having in our pipe line by end of 2019-early 2020, 33 modules for the proposed large scale new 100MW Japan IPP power generation project that will be backed by a 20 year PPA from TEPCO (Tokyo Electric Power Company) associate, details are as per the diagram below:-

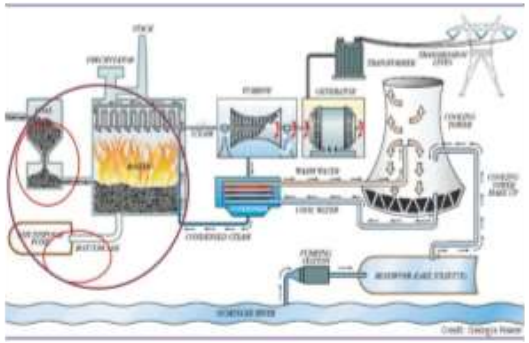


In terms of contract usage of the IP, the algae oil cultivation for this IPP project would generate royalty fee revenue of USD29,700,000 per annum for NGOSB. The revenue generation from this IPP project can also go on for many years to come, whereby, at the minimum would generate royalty fees of USD594,000,000 for NGOSB based on the 20 year tenure of the PPA.

Our Services includes

- Long term, stable and consistent supply of Crude Algae Oil, Algae Biodiesel fuel and Dry Algae Cake at low fixed prices

- Build and operate 100MW – 1000MW renewable energy power generation plants fuelled by our Crude Algae Biofuel



- Conversion of coal fired power plants into renewable energy power generation plants using Crude Algae Biofuel

We can enter into Long Term Crude Algae Oil/Algae Biodiesel/Dry Algae Cake Supply Contracts with Large Major Corporations/Oil & Gas Companies Anywhere in the World

Fixed Price for Algae Biodiesel	:	Below USD500 per kilo litre (kl)
Fixed Price for Crude Algae Oil	:	Below USD450 per kl
Fixed Price for Dry Algae Cake (to replace pulp)	:	Below USD650 per metric tonne
Minimum Fixed Tenure of Supply Contract	:	10 Years
Minimum Supply Volume Per Annum	:	120,000 kl to 1,000,000 kl per annum

- Note:- Contract awarder bears no risks on the long term supply contract as Next Gen Oil requires to spend and fund its own costs for all expenses on capital expenditure to construct, build and operate its own extensive algae oil/dry algae cake harvesting & processing facilities in order to cater for the long term supply contract.

1 kilo litre = 6.29 barrels

*"Current Market price of fossil diesel fuel is approximately USD600 per kilo litre whilst our **algae biodiesel** oil selling price is USD450 per kilo litre & shall be at this constant fixed stable price level throughout whole duration of the long term supply contract"*

*"Current Market price of pulp material which produces paper ranges from approximately USD850 per metric tonne & upwards, whilst our **dry algae cake** selling price is USD600 per metric tonne to substitute pulp & shall be at this fixed stable price level throughout whole duration of the long term supply contract"*

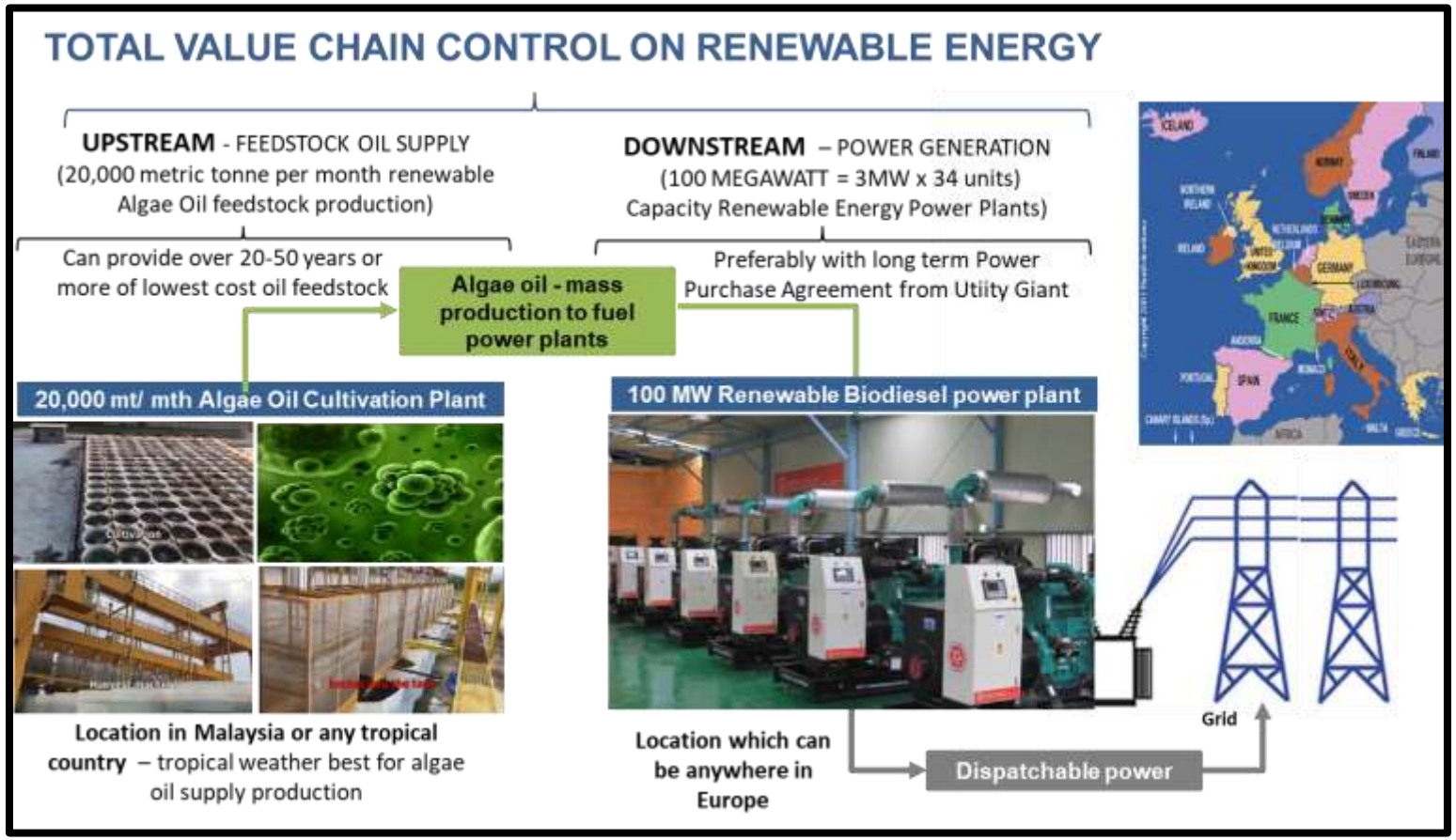
Production of Crude Algae Oil & Dry Algae Cake from NGOSB's Algae Biomass produce from our patented A-MAP Tanks

Algae Biomass harvested daily from NGOSB A-MAP tank facilities (Approximately 15 to 18 kilograms of Algae biomass is produced per tank/ day)

A-MAP's algae biomass has 50% oil extraction rate which is turned into Crude Algae Oil (CAO)

Remaining 50% of A–MAP's Algae biomass Is turned into Dry Algae Cake (DAC)

We Can Build & Operate 100MW to 1GW Renewable Energy Power Generation Plants Each to be located Anywhere in the World Fuelled by our Long Term Algae Crude Oil Produce



Terms of Any Power Purchase Agreement (PPA) with any large bankable Power Utility Company Anywhere in the World

Required Minimum Tenure of PPA	:	**a) 20 to 25 Years (NGOSB & Existing Coal Plant Owner as the Co-Owners operates)** **b) 25 years above (Built Transfer & Operate) with either a local company of that locality /region or any Govt.**
Fixed Selling Price in PPA	:	**To be equivalent to same rate as other biomass/diesel oil**
Locations	:	**Anywhere in the World**
EPC Contractor	:	**Either Hanwha Construction & Engineering (South Korea's Top 8 biggest construction company) or Samsung Construction & Engineering**
Funding Source	:	**NGOSB shall provide its own funding for this power generation & coal fire power plant conversion project on the basis any large bankable power utility company awarding the long term PPA**

TIMELINE FOR CONSTRUCTION OF MODULAR 100MW RENEWABLE ENERGY POWER PLANT TO BE POWERED BY NGOSB'S ALGAE CRUDE OIL IN JAPAN / ANYWHERE IN THE WORLD

Modular biodiesel power plants have quick time to market

- Project completion within 12 - 18 months from initiation.
- Only requires only 3,000 square feet per MW (size of 2 flats), compared to 200,000 square feet per MW for wind or solar projects.
- Modular size allows for quick regulatory approvals.

Project management timeline of micro biodiesel power plant assets

- Regulatory framework
- Technical studies
- Financial studies

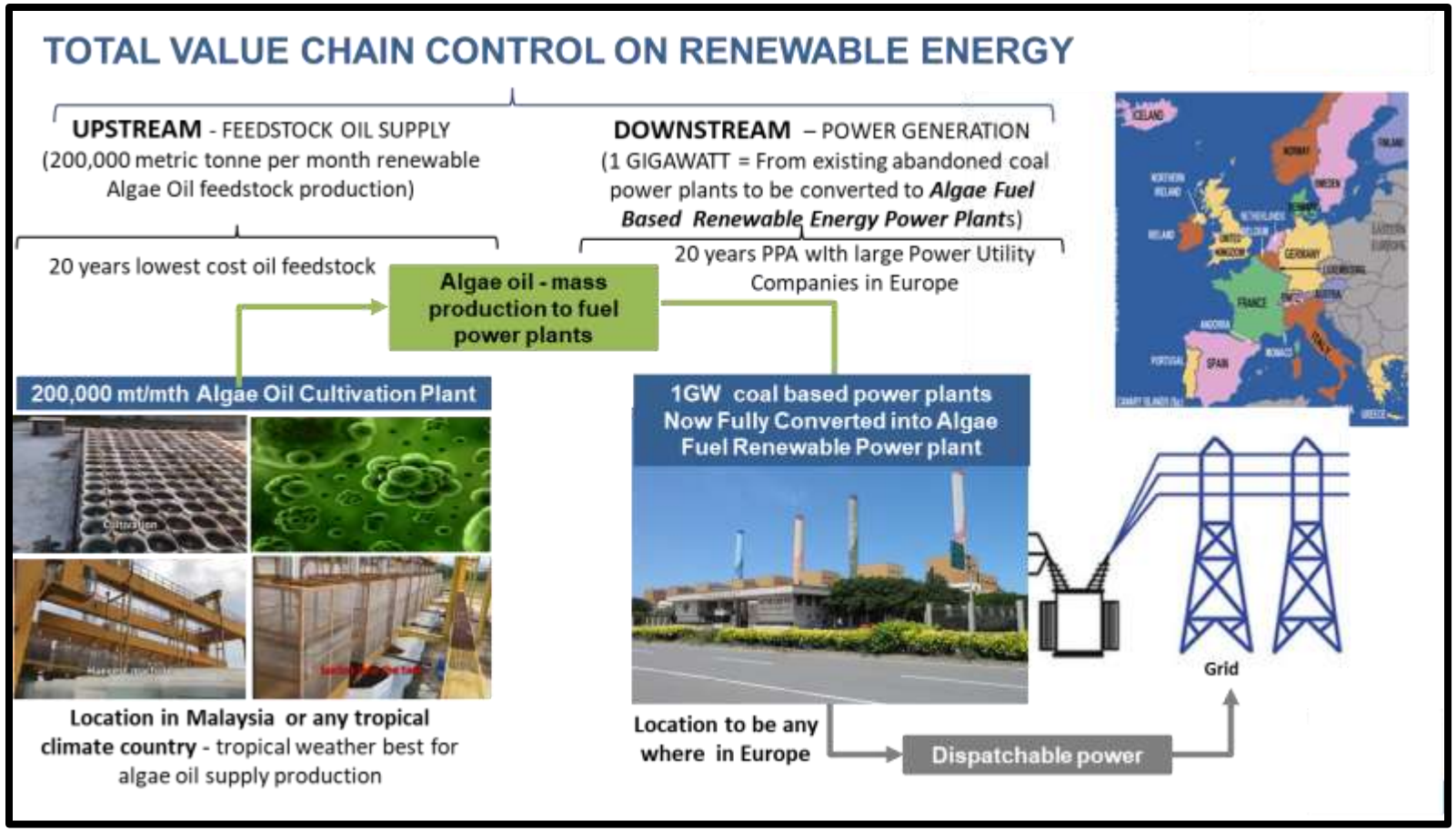
- Project design
- Site selection
- Community engagement
- Landowner agreement
- Generation license app.
- Grid connection app.

- Feedstock contracts
- EPC contracts
- O&M contracts
- Revenue contracts
- Insurance contracts

- Final Investment Decision
- Shareholder agreements
- Loan agreements

Potentially Huge Future Business Growth for NGOSB in the Area for Conversion of Abandoned Coal Fire Power Plants Worldwide into Fully Algae Fuel Based Green Renewable Energy Generation Plants

NGOSB Can Do Conversion of Already Closed Down/Abandoned or Newly Planned Coal Fire 100MW to 1GW Power Plants to be Fully Converted & Operate into Algae Oil Fuel Based Renewable Energy Power Plants



Terms of Any Power Purchase Agreement (PPA) with any large bankable Power Utility Company Anywhere in the World

Required Minimum Tenure of PPA	:	**a) 20 to 25 Years (NGOSB & Existing Coal Plant Owner as the Co-Owners operates)** **b) 25 years above (Built Transfer & Operate) with either a local company of that locality /region or any Govt. Fixed Selling**
Price in PPA	:	**To be equivalent to same rate as other biomass/diesel oil**
Locations	:	**Anywhere in the World**
EPC Contractor	:	**Either Hanwha Construction & Engineering (South Korea's Top 8 biggest construction company) or Samsung Construction & Engineering**
Funding Source	:	**NGOSB shall provide its own funding for this power generation & coal fire power plant conversion project on the basis any large bankable power utility company awarding the long term PPA**

Sales Process of retrofit-conversion of old Coal Power Plant

Contact current owner of abandoned coal power plant

↓

Offer equity to owner of old coal power plant with condition like under new deal, the owner is responsible to renew the license and PPA also do O&M in future.

↓

Both agree on equity and detail of business and receive the license & PPA go for project funding.

↗

Project funding will be easier due to equity participation of existing owner of old coal power plant, our reputable EPCC and algae oil fuel supplier (NGOSB)

↓

New power plant which will run on algae fuel shall issue Oil purchase contract for 20-30yrs with fixed price, this will make it easier for funding on Algae plantation

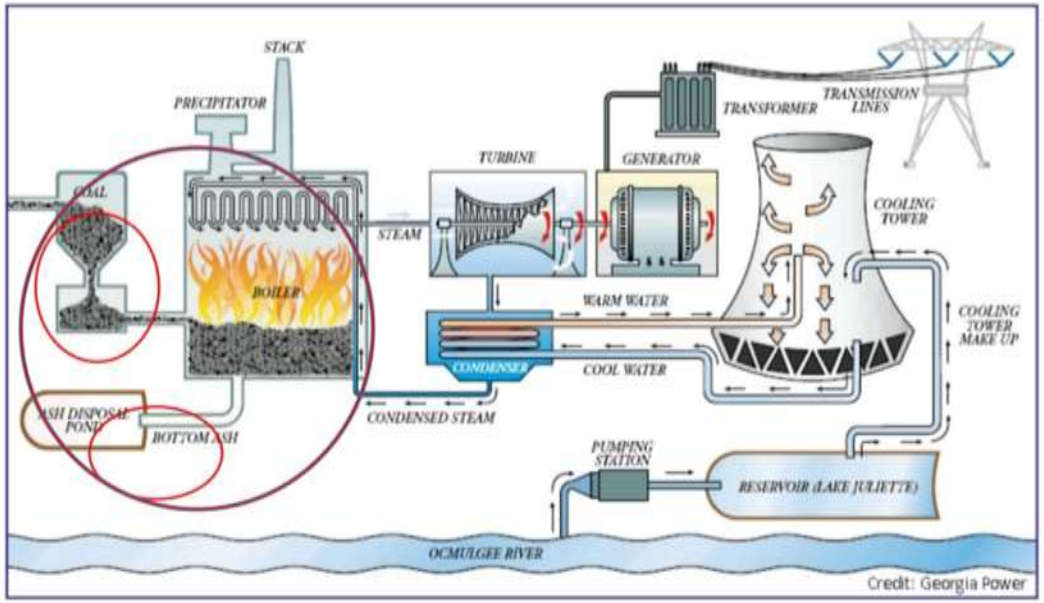
↓

Algae plantation will be built same time as power plant finishes retrofit.

Note:- *Kindly go into this website*

https://www.carbonbrief.org/mapped-worlds-coal-power-plants *to be able to find owners of any coal fire power plants located anywhere in Europe or global region in the global map location and click onto the white circle to find details and status of any abandoned or newly planned coal fired power plants at that location.*

Diagram of Technical Changes to be made on Already Abandoned coal fired power plant to be Converted into Fully Algae Oil Fuel Based Renewable Energy Power Plant




Los Angeles Times

Germany to close all 84 of its coal-fired power plants, will rely primarily on renewable energy

In this Jan.6, 2019, file photo water vapor rises from the cooling towers of the Joenschwalde lignite-fired power plant of Lausitz Energie Bergbau AG in Brandenburg, Germany. (Patrick Pleul / AP)

By ERIK KIRSCHBAUM

JAN. 26, 2019
12:33 PM

Reporting from Berlin — Germany, one

End Result of Conversion

From coal fired power plant which previously polluted toxic emissions into the atmosphere

Full Conversion into Green Renewable Energy Plant

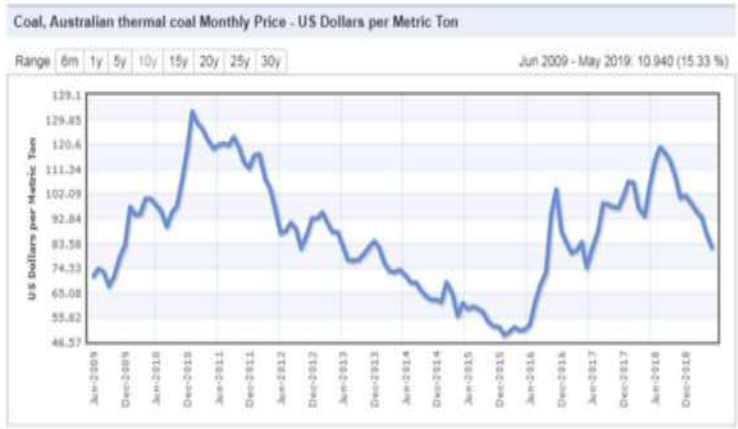
Fully Converted Algae Oil Fuel Based Green Renewable Energy Power Plant without Polluting Carbon Emission

Note: only the portions under the red circle representing ***one tenth portion or less of the existing facility equipment shall be changed/converted*** from the coal fired power plant into fully algae fuel based total renewable energy power plant. Rest of the plant remains the same.

*Under NGOSB's proposed extensive algae oil cultivation and processing farm, this enables reliable and proven large daily production of algae oil fuel feedstock for these new renewable energy power generation plants, ***the price of the algae oil fuel shall remain constant & low cost throughout whole tenure of any PPA with European Power Utility Giant, thereby, avoiding any high operating costs currently facing coal fire plant operators***.

**** Algae Biofuel Oil cost is also far less than diesel fuel cost.***

Volatile Coal Prices over the Years leading to High Operating Costs have contributed to shut down of Coal Fired Power Plants



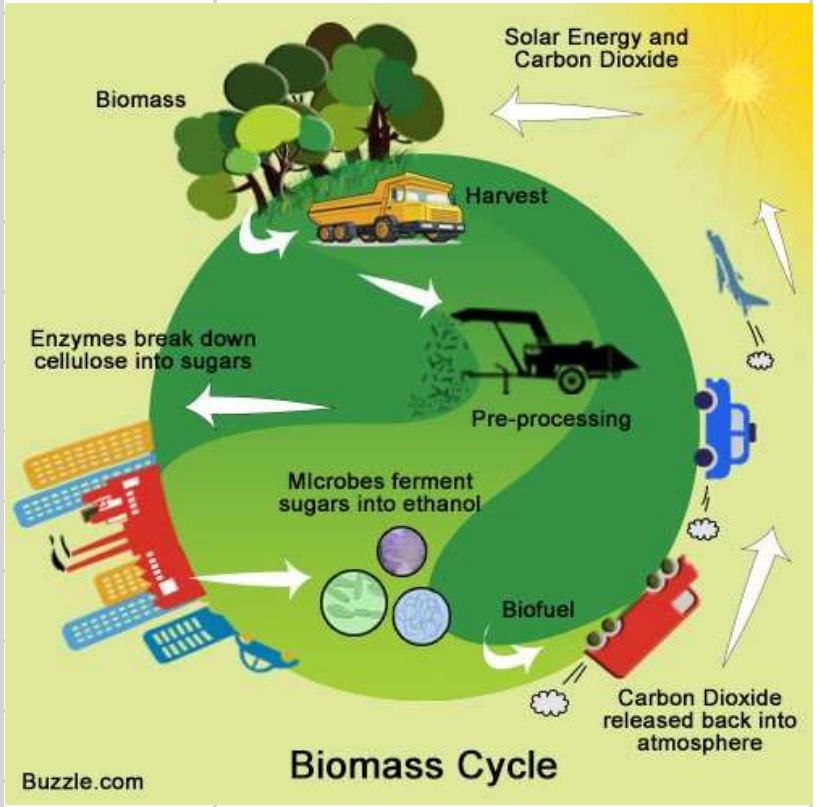

BusinessLine
2019 | Published on May 10, 2019

In total, 289 plants have been closed since 2010 comprising 40 per cent of the US's coal power capacity

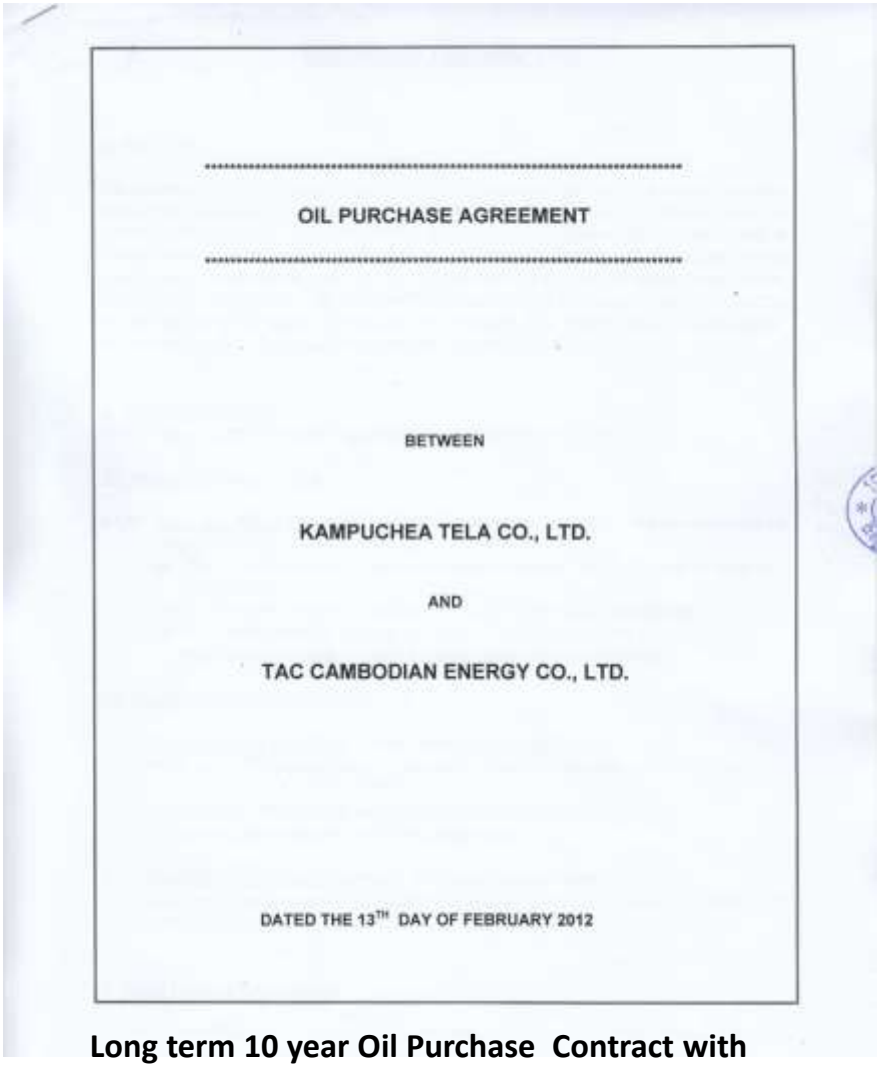
Fifty coal-fired power plants have shut in the United States since President Donald Trump came to office two years ago.

Immense Size of Retrofitting & Reviving Closed Coal Power Plants into Algae Fuel Power Plants in Europe Alone

Closed Coal Power Plants in European Union	(Size in MW)
iceland	1,481
england	11,869
sweden	252
finland	1,526
russia	7,405
ukraine	18,700
poland	8,325
austria	283
germany	49,281
netherlands	4,837
denmark	2,805
france	2,515
spain	2,152
portugal	1,978
italy	9,099
TOTAL	122,508



Existing Trackrecord of Long Term Supply Contracts already signed by NGOSB& related companies with Recognised Major Corporations for Supply of Crude Algae Oil, Algae Biodiesel & Algae Cake



OIL PURCHASE AGREEMENT

BETWEEN

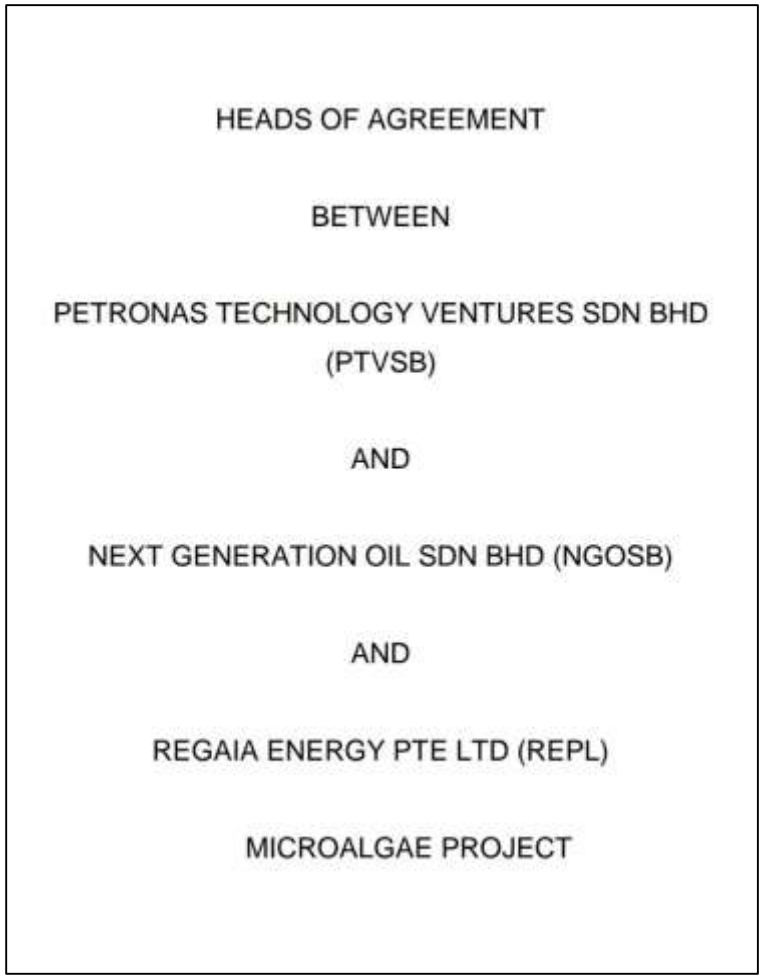
KAMPUCHEA TELA CO., LTD.

AND

TAC CAMBODIAN ENERGY CO., LTD.

DATED THE 13TH DAY OF FEBRUARY 2012

Long term 10 year Oil Purchase Contract with Kampuchea Tela Co. Ltd, Cambodia's national oil & gas company, to supply 100,000 MT per annum of Algae Biodiesel Oil



HEADS OF AGREEMENT

BETWEEN

PETRONAS TECHNOLOGY VENTURES SDN BHD (PTVSB)

AND

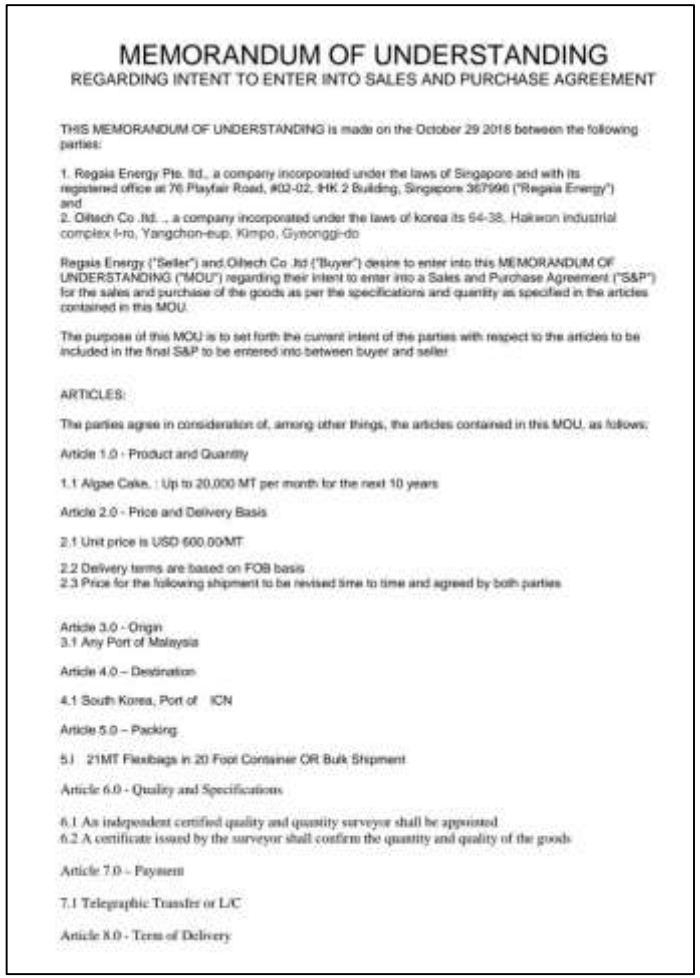
NEXT GENERATION OIL SDN BHD (NGOSB)

AND

REGAIA ENERGY PTE LTD (REPL)

MICROALGAE PROJECT

Heads of Agreement 5 + 2 years long term Contract recently signed with a large Fortune 500 company, Petronas, oil & gas major to supply 36,000 MT per annum of Crude Algae Oil



MEMORANDUM OF UNDERSTANDING

REGARDING INTENT TO ENTER INTO SALES AND PURCHASE AGREEMENT

THIS MEMORANDUM OF UNDERSTANDING is made on the October 29 2018 between the following parties:

1. Regaia Energy Pte. ltd., a company incorporated under the laws of Singapore and with its registered office at 76 Playfair Road, #02-02, IHK 2 Building, Singapore 367998 ("Regaia Energy") and
2. Oiltech Co .ltd. ., a company incorporated under the laws of korea its 64-38, Hakwon industrial complex I-ro, Yangchon-eup, Kimpo, Gyeonggi-do

Regaia Energy ("Seller") and Oiltech Co .ltd ("Buyer") desire to enter into this MEMORANDUM OF UNDERSTANDING ("MOU") regarding their intent to enter into a Sales and Purchase Agreement ("S&P") for the sales and purchase of the goods as per the specifications and quantity as specified in the articles contained in this MOU.

The purpose of this MOU is to set forth the current intent of the parties with respect to the articles to be included in the final S&P to be entered into between buyer and seller.

ARTICLES:

The parties agree in consideration of, among other things, the articles contained in this MOU, as follows:

Article 1.0 - Product and Quantity

1.1 Algae Cake, : Up to 20,000 MT per month for the next 10 years

Article 2.0 - Price and Delivery Basis

2.1 Unit price is USD 600.00/MT

2.2 Delivery terms are based on FOB basis
2.3 Price for the following shipment to be revised time to time and agreed by both parties

Article 3.0 - Origin
3.1 Any Port of Malaysia

Article 4.0 – Destination

4.1 South Korea, Port of ICN

Article 5.0 – Packing

5.1 21MT Flexibags in 20 Foot Container OR Bulk Shipment

Article 6.0 - Quality and Specifications

6.1 An independent certified quality and quantity surveyor shall be appointed
6.2 A certificate issued by the surveyor shall confirm the quantity and quality of the goods

Article 7.0 – Payment

7.1 Telegraphic Transfer or L/C

Article 8.0 - Term of Delivery

MOU signed with Oiltech Co. Ltd, South Korea's largest oil trading company for 10 year long term contract to supply 140,000 MT per annum Algae cake

Latest MOU for 1,000,0000 MT per month recently signed with subsidiary company of People Republic of China Govt.'s Fortune 500 GLC in Jan 2020 - Supply of Crude Algae Oil & Dry Algae Cake

THIS MEMORANDUM OF UNDERSTANDING ("MOU") is made on the January 3rd DAY OF (MONTH) 2020
本谅解备忘录(下称"谅解备忘录")于 2020 年 1 月 3 日签订。
Between 在期间

NEXT GENERATION OIL SDN BHD. (Company Registration No: 1192999-T) (hereafter referred to as **"the Producer/Seller")** having its registered office at E-13A05, PLAZA MONT KIARA, NO.2, JALAN KIARA, KUALA LUMPUR, MALAYSIA.
下一代石油 SDN BHD。(公司注册号: 1192999-T)(以下简称"生产商/销售商"),注册地址为马来西亚吉隆坡吉隆基亚拉广场 2 号 E-13A-05。
AND 和

AERONAUTICS AND SPACE (PEKING)TECHNOLOGY GROUP CO., LTD (unified social credict code 91110108MA01AH8T73) (hereinafter referred to as **"the Buyer")** having address at Block 6B-1038,28 Information Road, Haidian District, Beijing,China.
航源同创(北京)科技有限公司(统一社会信用代码 91110108MA01AH8T73),注册地址为北京市海淀区信息路 28 号 6 层 B 座-1038 号

ON BASIS AND UNDERSTANDING WHEREBY BOTH THE PRODUCER/SELLER AND THE BUYER INTEND TO ENTER INTO A CRUDE ALGAE OIL ("CAO") AND DRY ALGAE CAKE ("DAC") LONG TERM SUPPLY CONTRACT AGREEMENT WITH EACH OTHER.
在此基础上,生产商/卖方和买方均有意与对方签订粗藻油("CAO")和干藻饼("DAC")长期供应合同协议。

WHEREAS 鉴于

A. The Producer/Seller is a company involved in cultivation, harvesting and processing of microalgae into Crude Algae Oil ("CAO") and Dry Algae Cake ("DAC"). The Producer/Seller has the right of licencing to utilise the intellectual properties for the production technology know-how for the production of CAO and DAC.
生产商/销售商是一家从事种植、收获微藻并将其加工成粗藻油("CAO")和干藻蛋糕("DAC")的公司。生产者/销售者有权将生产技术诀窍的知识产权用于 CAO 和 DAC 的生产。

B. The Buyer is a company involved in techonoloy development, technology transfer etc. that is substantially owned by China Merchants Group ("CMG"), a large state owned corporation, which is in turned owned by the People's Republic of China. CMG is headquartered in China Merchants Tower, Shun Tak Centre, Hong Kong.
B. 买方是中國招商局下的子公司經營範圍有技術開發、技術轉讓等。中国招商局是一家大型国有公司,由中华人民共和国拥有。招商局总部设于香港信德中心招商局大厦。

张竟东

1

1.0 PURPOSE 目的

The purpose of this MOU is for the parties intent to enter into a CAO and DAC Long Term Supply Contract Agreement for which in the event the Contract Agreement is executed between the Producer/Seller and the Buyer, the Producer/Seller is to provide continuous uninterrupted stable supply of CAO and DAC to the Buyer based on the following Principal Terms and Conditions:-
本谅解备忘录的目的是供双方意向签订 CAO 和 DAC 长期供应合同协议,在生产商/销售商和买方签署合同协议的情况下,生产商/销售商将根据以下主要条款和条件向买方提供连续不间断的 CAO 和 DAC 的稳定供应:-

2.0 Tenure of Supply Contract : 10 Years and can be automatically renewed on basis and subject to execution of the Long Term Supply Contract Agreement.
供应合同期限 : 10 年,并可根据长期供应合同协议的执行情况自动续签。

4.0 Supply Volume Per Month : Subject to execution of the Long Term Supply Contract Agreement, Minimum Order Quantity (MOQ) of 200,000 Metric Tonnes (MT) per month and Minimum Order Quantity (MAOQ) of up to 1,000,000 MT per month for each CAO and DAC.
每月供给量 : 根据长期供应合同协议的执行情况,每个 CAO 和 DAC 每月的最低订货量(MOQ)为每月 1,000,000 公吨以上。

5.0 For Delivery by Sea : CIF Port of China or Hong Kong

张竟东

2

MOU signed with subsidiary company of People Republic of China Government's Fortune 500 GLC, China Merchant Group for 10 year long term contract to supply 1,000,000 MT per month each of Crude Algae Oil & Dry Algae Cake

海运 : 中国或香港到岸价

6.0 CIF Charges by the Seller :Subject to execution of the Long Term Supply Contract Agreement, USD20 per MT shall be charged by the Seller/Producer over and above the Selling Prices of CAO and DAC and sold and delivered to the Buyer. 根据长期供应合同协议的执行,卖方/生产商应在 CAO 和 DAC 销售价格的基础上收取每公吨 20 美元的费用,并将其出售和交付给买方。
(CIF 价格为供应价格外加每吨 20 美元的海运费)

7.0 Corporate Guarantee of CMG : Subsequent to this MOU, in the event the Long Term Supply Contract Agreement for the CAO and DAC is executed between the Producer/ Seller and the Buyer, a mandatory condition under the Contract Agreement shall include the requirement of a full Corporate Guarantee from CMG on behalf of the Buyer with regards to guarantee of any payment to the Producer/Seller for the successful supply and delivery for each of the CAO and DAC to the Buyer.
CMG 的企业担保. : 在本谅解备忘录之后,如果生产商/卖方和买方签署了 CAO 和 DAC 的长期供应合同协议,合同协议下的一个强制性条件应包括 CMG 代表买方提供全额公司担保,以保证向生产商/卖方支付任何款项,以成功向买方供应和交付 CAO 和 DAC 中的每一个交易。

8.0 Prices of the CAO and DAC CAO 和 DAC 的价格

Price for Crude Algae Oil (CAO) : Subject to execution of the Long Term Supply Contract Agreement, the Producer/Seller's CAO shall be sold to the Buyer at Floating Selling Price during whole duration of this supply contract, which shall be based on 10% discounted price of Crude Palm Oil international market price
藻类原油价格(CAO). : 根据长期供应合同协议的执行,生产者/销售商的 CAO 在本供应合同的整个有效期内以浮动销售价格出售给买方,该价格应以国际原油棕榈油市场价格的 10%折扣价为基础

AND 並且

3

张竟东

USD200 BIL VALUE OF SIGNED CONTRACTS & PROJECTS IN PIPELINE TO BE AWARDED BY 1ST / 2ND QUARTER 2020

Type & Description of Contract / Project	Client & Country	Tenure of Contract/PPA	Size/Order Quantity (yearly)	Yearly Revenue (USD)	Total Project Value (USD)
Crude Algae Oil/Algae Biodiesel Contracts					
1. Crude Algae Oil & Dry Algae Cake Supply Contract with Malaysia's National Oil & Gas company signed in Oct 2019	**Petronas** - Malaysia	5 years	36,000 mt	15,840,000	79,200,000
2. Algae Biodiesel Supply Contract with a large China conglomerate group	**Kanger Shenzen** - China	10 years	12,000,000 mt	5,400,000,000	54,000,000,000
3. MOU for Crude Algae Oil & Dry Algae Cake Supply with Govt. of China major GLC conglomerate subsidiary signed Jan 2020	**China Merchant Group** – China	10 years	24,000,000 mt	12,000,000,000	120,000,000,000
4. Crude Algae Oil & Algae Biodiesel Supply Contract with one of largest Malaysian GLC conglomerates	**Sime Darby** - Malaysia	10 years	180,000 mt	72,000,000	720,000,000
5. Crude Algae Oil & Algae Biodiesel Supply Contract with one of largest Malaysian Public listed conglomerates	**Hap Seng** - Malaysia	10 years	360,000 mt	140,000,000	1,400,000,000
6. 2,400 algae tanks x 5 modules = 10,000 algae tanks purchase and operated by Regaia with 15% ROI per annum for client	**UMW** - Malaysia	20 to 30 years	N/A	-	20,000,000
Dry Algae Pulp Contracts					
7. Dry Algae Pulp Supply Contract with one of largest Malaysian pulp & paper producing conglomerates	**GS Paperboard & Packaging** - Malaysia	10 years	1,260,000 mt	756,000,000	7,560,000,000
Crude Algae Fuel Renewable Power Generation Projects with PPAs					
8. Power Agreement with Indonesia's National Electricity Company to build, own and operate in various phases, with total of 150MW capacity Algae Oil Renewable Power Plants	**PLN** - Indonesia	35 years	USD0.11/ kw @ 1 GW	144,540,000	5,058,900,000
9. PPA with Myanmar's National Electricity Company - Build, own and operate 70 MW Algae Oil Renewable Power Plants	**MOEE** - Myanmar	20 years	USD0.12 /kw @ 70 MW	73,584,000	1,471,680,000
10. PPA with Bangladesh 's National Electricity Company - Build, own and operate 250MW Algae Oil Renewable Power Plant	**Power Grid Bangladesh**	20 years	USD0.13/ kw @ 200 MW	284,700,000	5,694,000,000
12. Build, own and operate 60 MW Algae Oil Renewable Power Plant in South Korea based on floating market power tariff	**KEPCO** -South Korea	20 years	USD0.12 /kw @ 20 MW	63,072,000	1,261,440,000
13. PPA with Somalia's National Electricity Company - Build, own and operate 50MW Algae Oil Renewable Power Plant	**Somali Energy Co.**	20 years	USD0.13/ kw @ 50 MW	56,940,000	1,138,800,000
TOTAL CONTRACTS- PROJECTS PIPELINE VALUE				**19,006,676,000**	**198,404,020,000**

Newly formed US subsidiary of NGOSB for NASDAQ listing

Next Generation Oil

A-MAP IP Holder

Algae Crude & Dry Algae Cake Supply Co

.Power Generation Biz

Shareholder:

Peter Kim

80%

Our USA team establishing markets in Americas

San Diego

Two highly experienced & skilled ex-**Tesla Energy USA heads of divisions Senior Project Dev. Managers,** wide networks in USA renewable energy business markets

New York

20%

Incorporating USA company, Deep Green Bio LLC

DEEP GREEN BIO LLC in USA

Shareholders:

Next Generation Oil - 80%

Our USA team members- 20%

Division for ***USA Algae Crude Power Generation Biz***

Division for ***USA Long Term Contracts for Supply of Algae Crude Oil, Algae Green Diesel & Dry Algae Cake***

IPO IN THE USA BY 2ND HALF OF 2020

Via the NASDAQ IPO, listing a portion of shareholding stake in NGOSB's USA subsidiary, based on pipeline secured contracts, provides faster and earlier monetisation for returns back to the investors and shareholders

USD200 BIL VALUE OF SIGNED CONTRACTS & PROJECTS IN PIPELINE TO BE AWARDED BY 1ST / 2ND QUARTER 2020

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12. Build, own and operate 60 MW Algae Oil Renewable Power Plant in South Korea based on floating market power tariff	KEPCO -South Korea	20 years	USD0.12 /kw @ 20 MW	63,072,000	1,261,440,000
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TOTAL CONTRACTS- PROJECTS PIPELINE VALUE				19,006,676,000	198,404,020,000

Injection of portion in USD200 Bil worth of contracts secured by NGOSB into our USA subsidiary

DEEP GREEN BIO LLC in USA

Shareholders:

Next Generation Oil - 80%

Our USA team members - 20%

Meeting minimum capitalisation requirements under SEC listing regulations

Listing on NASDAQ of 10% to 20% shareholding stake in our USA based Deep Green Bio LLC by mid-end 2020

Nasdaq

Through US listing and other fundraising in USA, Deep Green Bio LLC can finance its own algae cultivation & production plantations as illustrated in diagram below, to cater for algae oil supply required for both power plant generation business & long term crude algae oil as feedstock for green diesel , jet fuel & dry algae cake supply contracts with its USA customers

(Algae plantation must be located in tropical country/ equatorial belt region)

Deep Green Bio LLC

Deep Green Bio LLC finance & own its own algae plantation

Division for *USA Algae Crude Power Generation Biz*

Division for *USA Long Term Contracts for Supply of Algae Crude & Bio Diesel*

Deep Green Bio LLC itself can cater for its own algae oil production & supply by raising its own financing

On supply algae oil for duration of PPA for New JV Co.

Awards back to back LT algae supply contract against PPA

New JV COMPANY with Power Plants Owners
80% - Deep Green Bio LLC
20% - Current Plant Owners

Bankable USA State Power Utiity Giant (Off-take)

Off-take awards minimum 20 to 30 year PPA to New JV Co.

Signs LT Algae Crude & Bio Diesel Oil Supply Contracts

Signs contract with

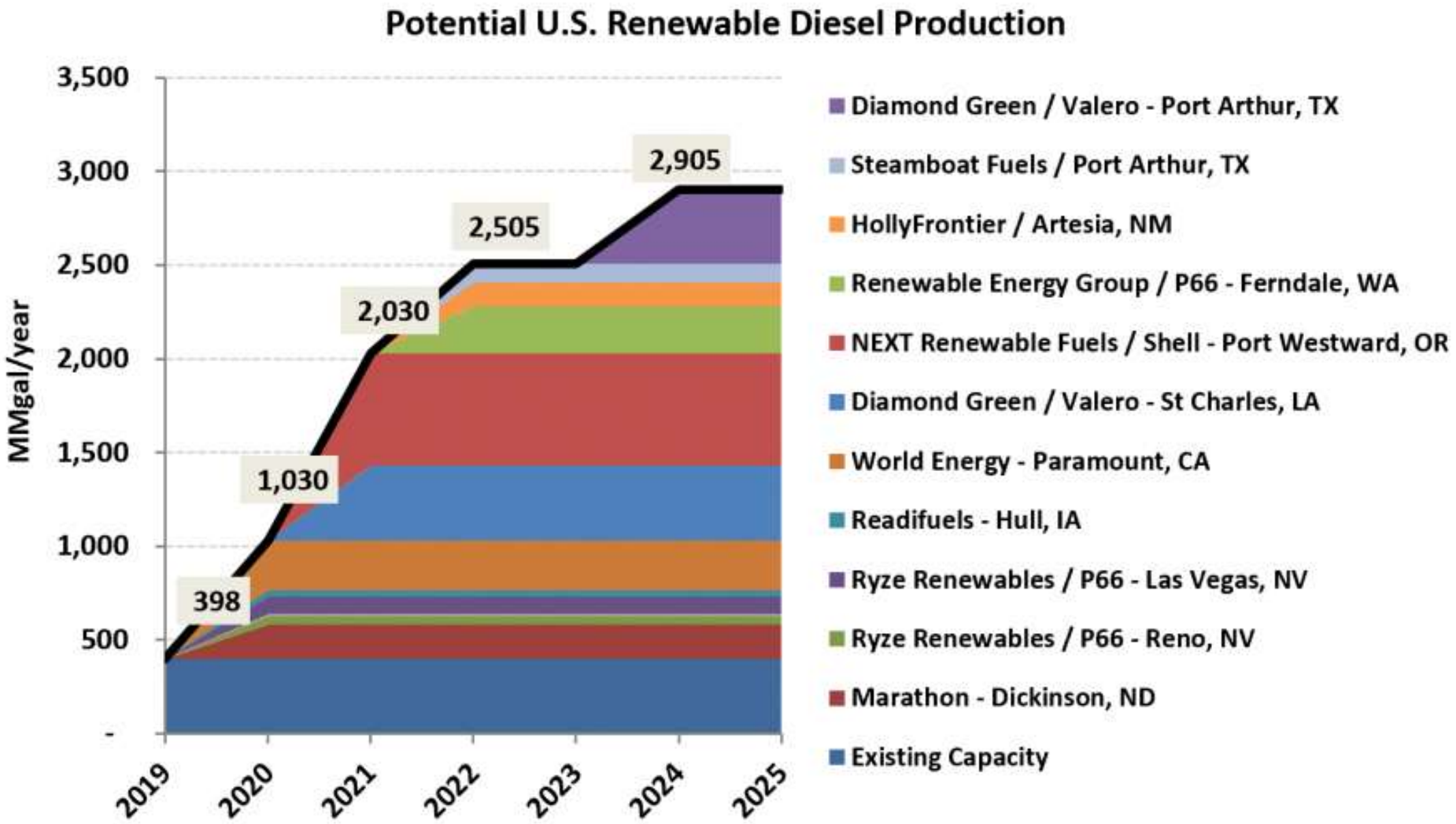
Bankable Strong Major Corporations / Oil & Gas cos. in USA

Plant boiler conversion

100mw to 1GW or more Abandoned /Closed Down Coal Fred Power Generation Plants

Fully Converted into Algae Fuel Renewable Power Generation Plant

Huge US Market Potential for Crude Algae Oil Supply Contracts as long term feedstock for Renewable Diesel Production



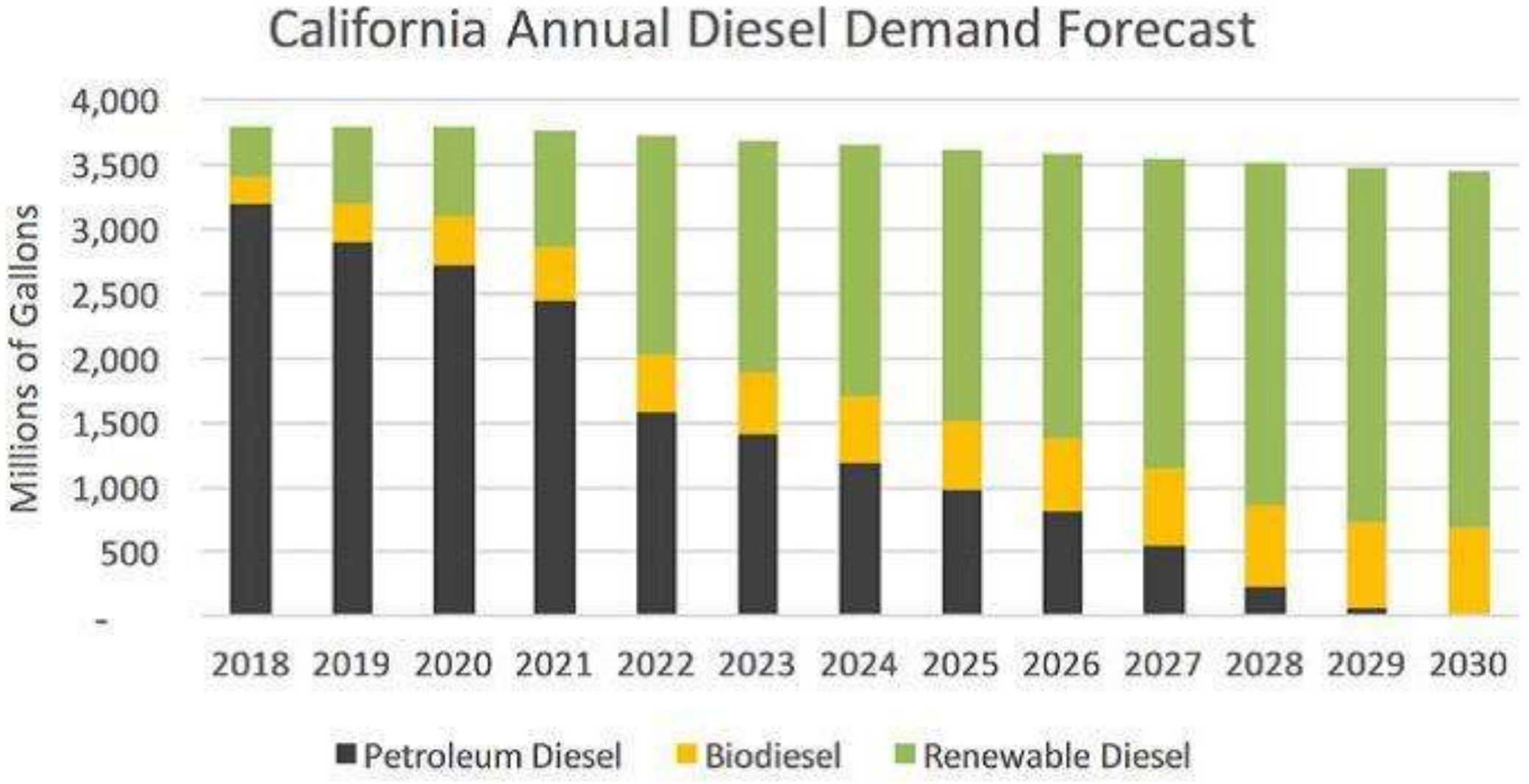
Huge US Market Potential for Crude Algae Oil Supply Contracts as long term feedstock for Renewable Diesel Production (cont'd)

- Feedstock shortage - Limited supply of waste oils - Pricing increases expected, the only feedstock sources currently available in the US are soybean oil & used cooking oil for which market prices hover over USD800 to USD850 per MT

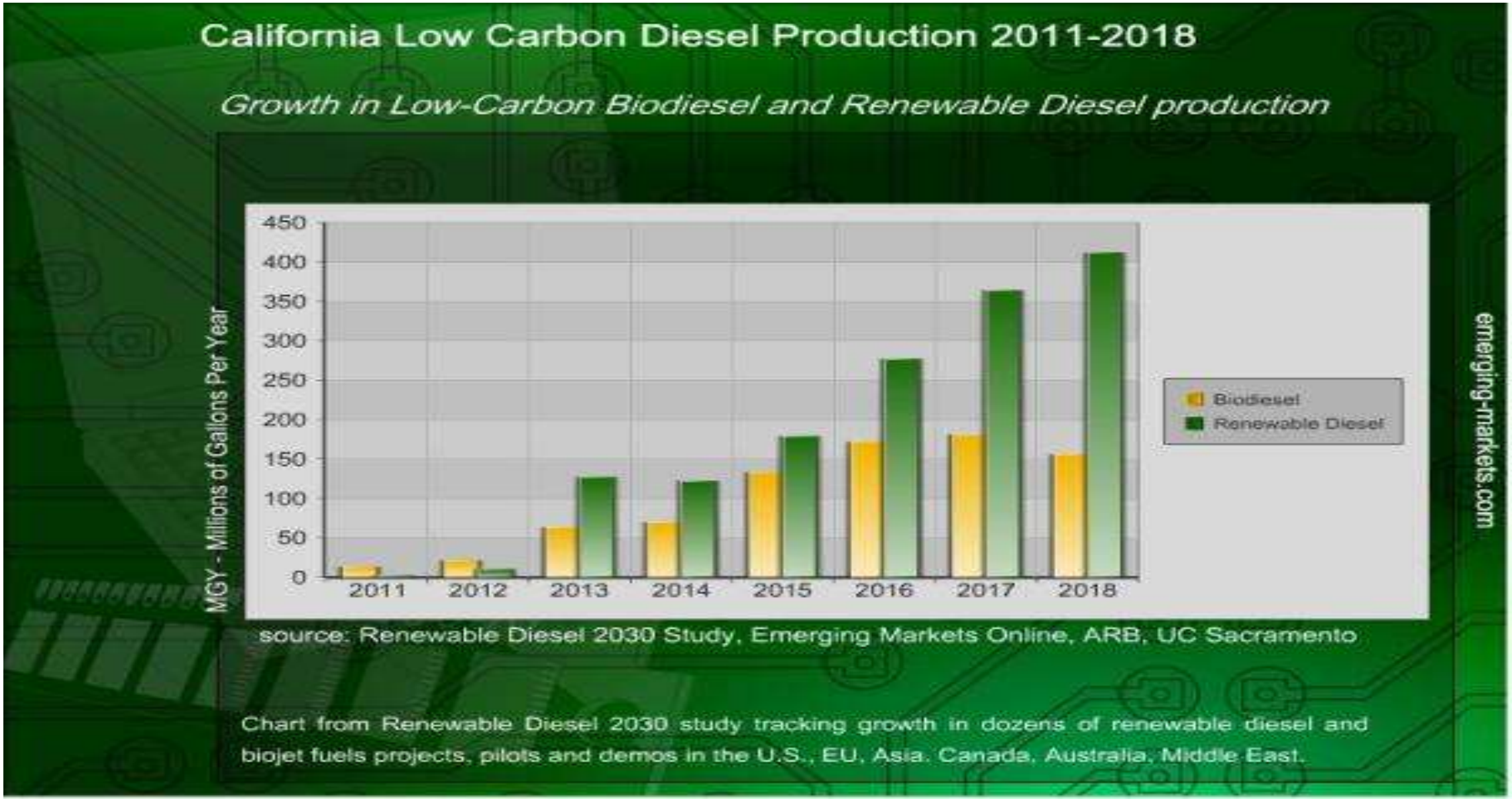
- Very favorable regulatory environment - CA. leading and spreading LCFS markets
  - LCFS credit for RND = $200/mt + RIN/RFS = $120/mt = **$310/mt**

- **US Biojet Fuel Market** - 1 BGY now → 4 BGY in 2025
  - World Oil/Paramount, Neste, BP, Fulcrum, SkyNRG, etc.
  - KLM agrees to buy 75K mt/yr for 10years from SkyNRG
    - ➢ Announced "Partnership" to jointly produce BJF

Huge US Market Potential for Crude Algae Oil Supply Contracts as long term feedstock for Renewable Diesel Production (cont'd)



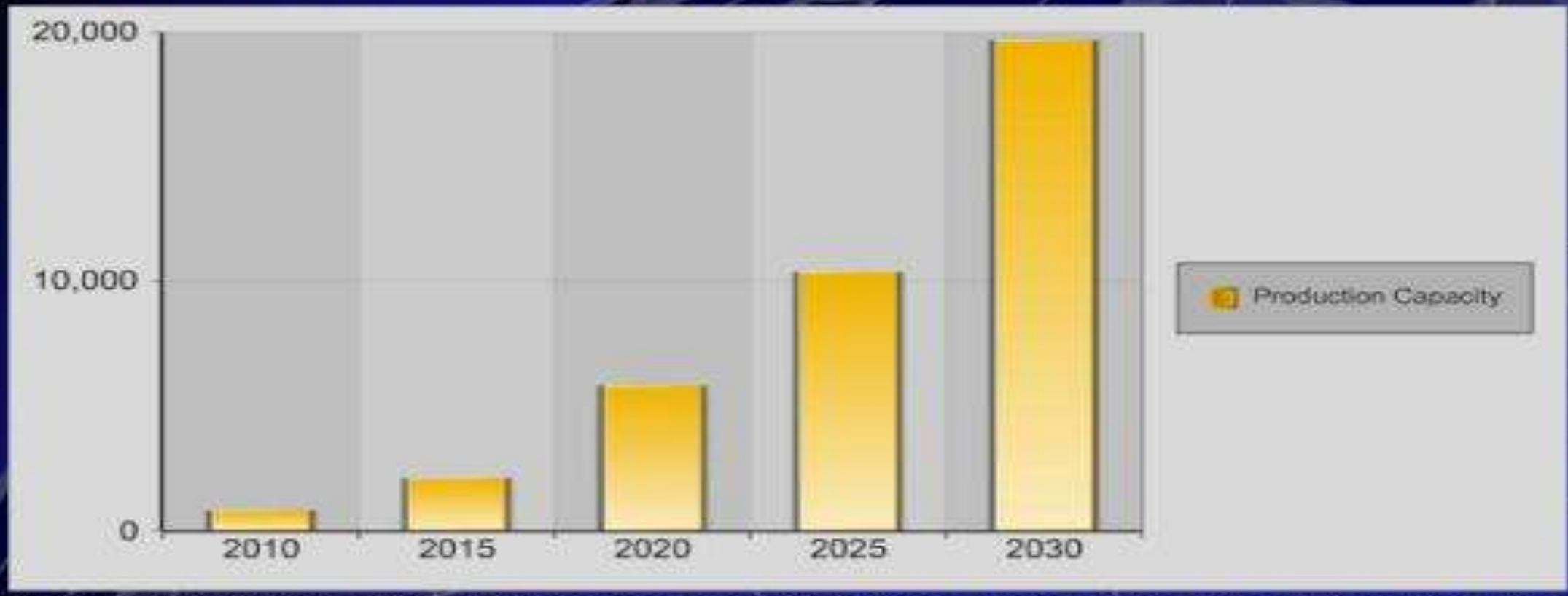
Huge US Market Potential for Crude Algae Oil Supply Contracts as long term feedstock for Renewable Diesel Production (cont'd)



Global Renewable Diesel & Jet Production 2015 to 2030

Growth in renewable diesel and biojet production facilities 2015-2030

Chart from Renewable Diesel 2030 study tracking growth in dozens of renewable diesel and biojet fuels projects, pilots and demos in the U.S., EU, Asia, Canada, Australia, Africa, Middle East.



source: Emerging Markets Online, Renewable Diesel 2030 study, Neste, DGD, REG, UOP, HaldorT, Axens

Huge US market potential for Dry Algae Cake : North America market overview

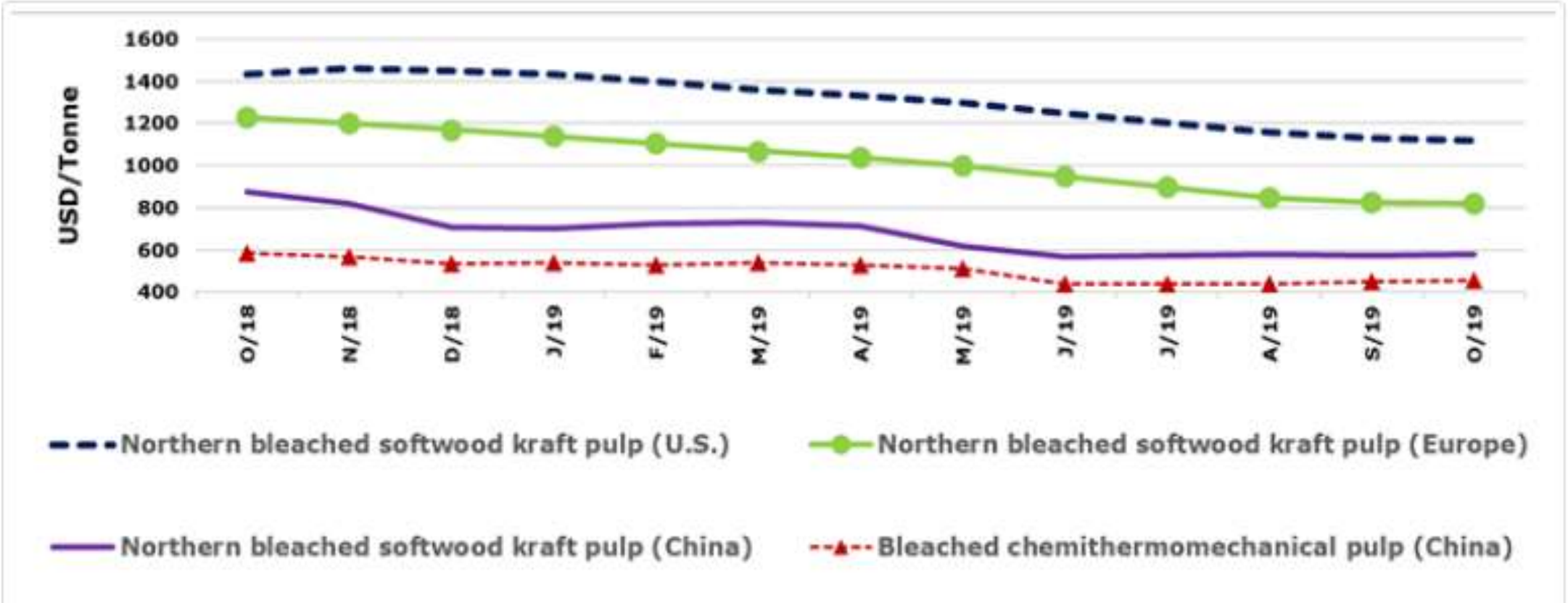
- 350 paper pulp, and packaging plants in USA,
- $186b industry
- North America consumes $20% of world-wide paper product consumption
- NA produces 38% of pulp, almost exclusively from wood/timber
- Demand is flat-to-down, imports are rising
- Industry has consolidated over the past decade
- Largest NA Paper products companies include :
    - International Paper
    - Georgia Pacific
    - WestRock
    - Domtar
    - Graphic Packaging International
    - Verso
    - Sappi
    - Proctor Gamble
    - Pratt Industries

Global Wood Pulp Prices, December 2019

Pulp prices

Figure 3: Monthly pulp prices

U.S. dollars per metric ton



WHY NGOSB FOR GLOBAL EXPANSION OF POWER GENERATION & ALGAE BIOFUEL BUSINESSES?

a) Having a large long term commercial supply contract with Petronas for the supply of algae crude oil (the 1st of its kind for an oil & gas major). As fully verified and confirmed by Petronas as well in their due diligence exercise on our algae cultivation and production methods under A-MAP which is wholly owned by NGOSB:-

- the overall **cost of production of our algae crude oil that we produce is the lowest in the world** even lower as compared to cost production of Saudi crude oil of between USD20 to USD25 per barrel and far lower as compared to any other vegetable oil or even palm oil production per barrel; and

- NGOSB is able to derive a consistent **highest algae crude oil extraction rate of close to 50% or more from our algae biomass cultivation farm**, higher than any other vegetable oil extraction rate and much higher than any other algae oil extraction rate from other algae oil producers in the world.

b) **Commercially viable to do large mass scale algae crude oil production** to cater as **cheapest and most cost effective fuel feedstock required for large mass scale renewable energy power generation businesses anywhere in the world especially in meeting power generation needs of retrofitted and converted abandoned coal power plants into far more cost efficient algae fuel based ones.** Under NGOSB's IP, each algae cultivation tank that operates are able to produce algae consistently non-stop on daily basis throughout the year in tropical climate.

c) We are **on course to be the next game changer as a key source of global energy fuel producer to cater for large scale global and regional industrial and power generation businesses** due to **our commercial capabilities & better cost advantages in being able to do mass production of algae crude oil/algae biodiesel at the lowest possible cost**, being far lower as compared to any oil/diesel producers globally whether it be for fossil fuel oil or vegetable oil.

d) NGOSB already have **existing track record of operating our own renewable energy power plant in South Korea** which is hooked to the national grid and being **fuelled by crude algae oil**.

e) NGOSB engages Hanhwa and/or Samsung E&C being the **most reliable, top internationally recognized and best performance global EPC contractors** to undertake construction of NGOSB's new contract orders for proposed plants & algae cultivation production facilities anywhere in the world.

f) We shall have **minimum 25 year warranty and performance guarantee on the power plant generation sets** from a Fortune 500 company which manufactures the top quality power generation sets for the proposed power plants

Appendice

Full details & benefits of NGOSB's gamechanging A-MAP engineering & processing systems + difference comparison to other existing biofuel producers

EXECUTIVE SUMMARY

NGOSB can produce BioOil in industrial volumes at commercial prices.

NGOSB's Algae-Modular Automated Plantations ("A-MAP"), has economically viable 3rd Generation Biomass and is delighted to present you with this proposal that can produce Efficient, Carbon Neutral and Renewable Energy.

Regaia

We have developed a commercially viable system to produce Algae Biomass ("ABM"). The system has been in development for 20 years under the leadership of Peter Kim and own a variety of patents related to the cultivation and harvesting of ABM.

Biomass is currently a small part of the solution to the World's energy requirements.

- Fossil Fuels continue to be the major source of energy in the world producing 82% of primary energy. Currently renewables provide a very low input and suffer from various drawbacks including variable/uncertain generation ability, specific location requirements and generally higher costs.
- Biomass is a traditional and widely used energy source but has little penetration into electricity or transport markets. Existing Biomass has low yields per hectare, requires long time to market and competes with food crops. Microalgae can be cultivated on non-arable land, at higher yields per hectare, quicker time to market, and lower operating costs.

A-MAP Advantage

- A-MAP uses Engineering and Process Improvements rather than Technological solutions to the previous problems associated with cultivating and harvesting Algae. Algae refining is a mature industry and Regaia follows Industry best practice.
- Malaysia is poised to take advantage of its ideal climate and become a world leader in this green agricultural innovation after past success with the rubber and palm industries.
- As of the end of September Regaia has harvested 2,410 Tons of ABM in 2018 from a small scale facility in Malaysia. This equates to 18.5 kilos of ABM per Tank per Day.

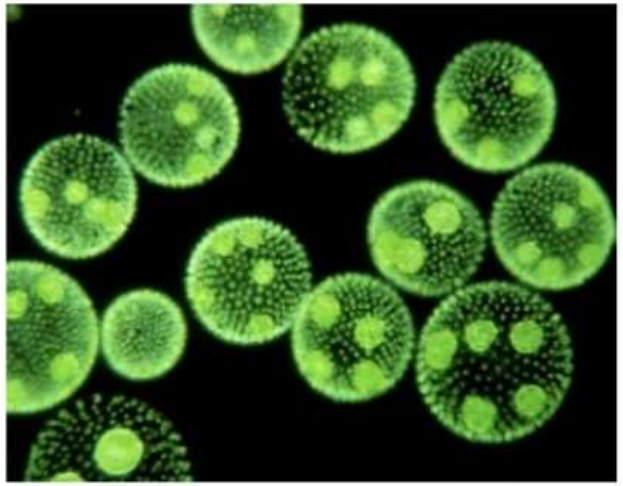
Algae

Algae is a term for a set of organisms which are amongst the oldest forms of life on Earth. Algae may be Single-celled or Multi-celled. Algae have a cell wall and normally reproduce by cell division with energy provided by Sunlight, CO^2 and micro doses of nutrients.

What exactly is Algae?

- Micro Algae is small microscopic aquatic photosynthetic plants that require the aid of a microscope to be seen whilst Macro Algae does not. However when these single-celled microscopic algae organisms join or chain themselves together in large enough numbers, they then become visible to the unaided human eye. This is typical seen in aquariums for example.
- Macro Algae on the other hand come in many colours including green, red, brown and blue, as well as in a variety of forms - some growing tall, with others growing as mats.
- The estimates of the number of living algae varying from 30,000 to over 1 million species, and one seminar presentation that suggested that there may even be as many as 350 million algae, or about 20 times the number of all organisms on Earth.
- Regaia uses a saltwater dwelling Algae in our process which has excellent lipid content.
- Algae are more efficient at producing oil than other crops because they grow faster, have high Oil% of mass and in a given volume have a larger section of the plant mass that produces oil.

Micro Algae



Macro Algae

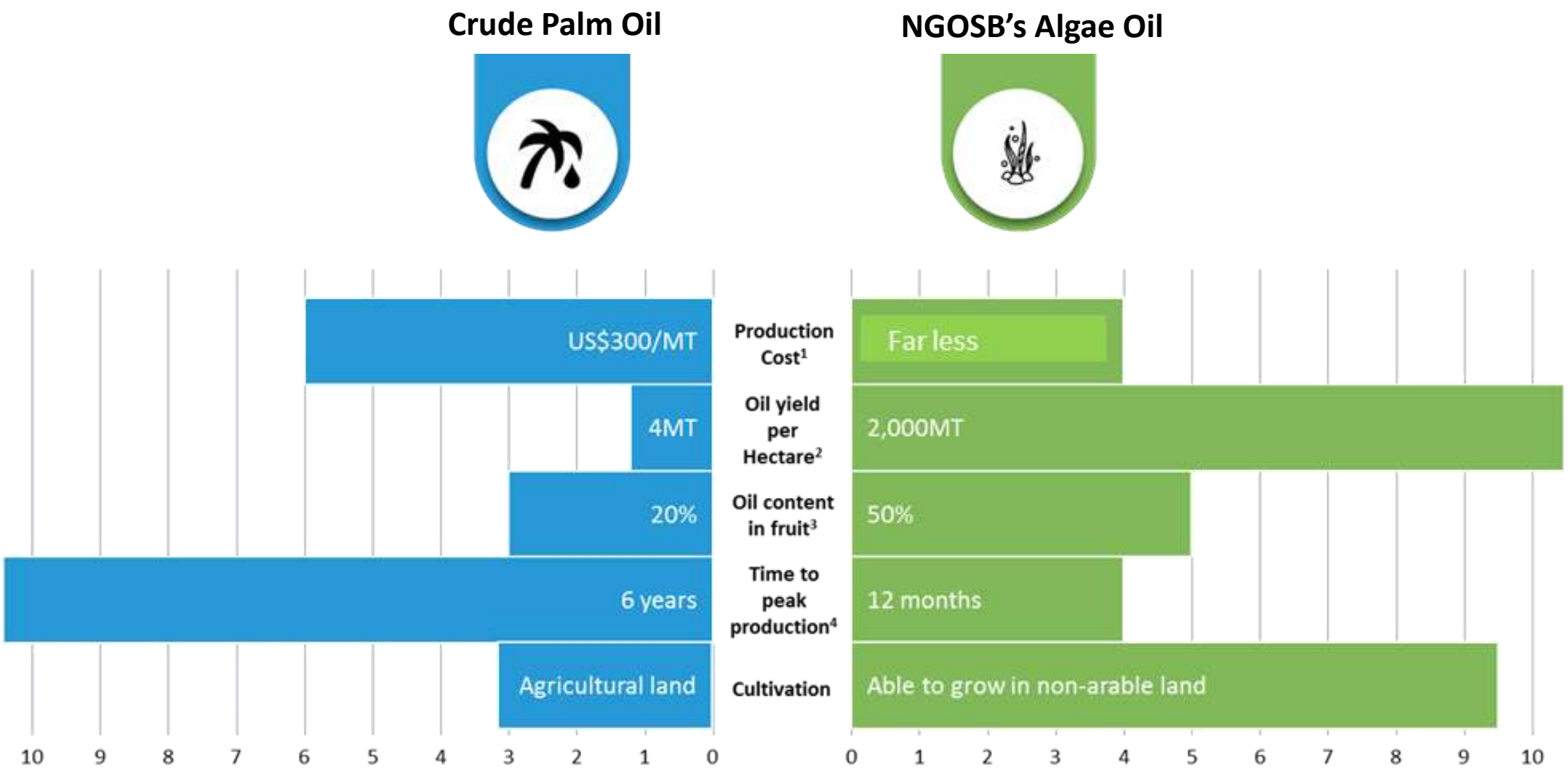
Algae Bloom

Yield Comparisons (Gallons of Oil per Acre/year)

Crop	
Corn	180
Soybeans	480
Sunflower	1,020
Rapeseed/Canola	1,270
Oil Palm	6,350
Micro Algae	50,000-150,000

US Energy Agency Report (1997)

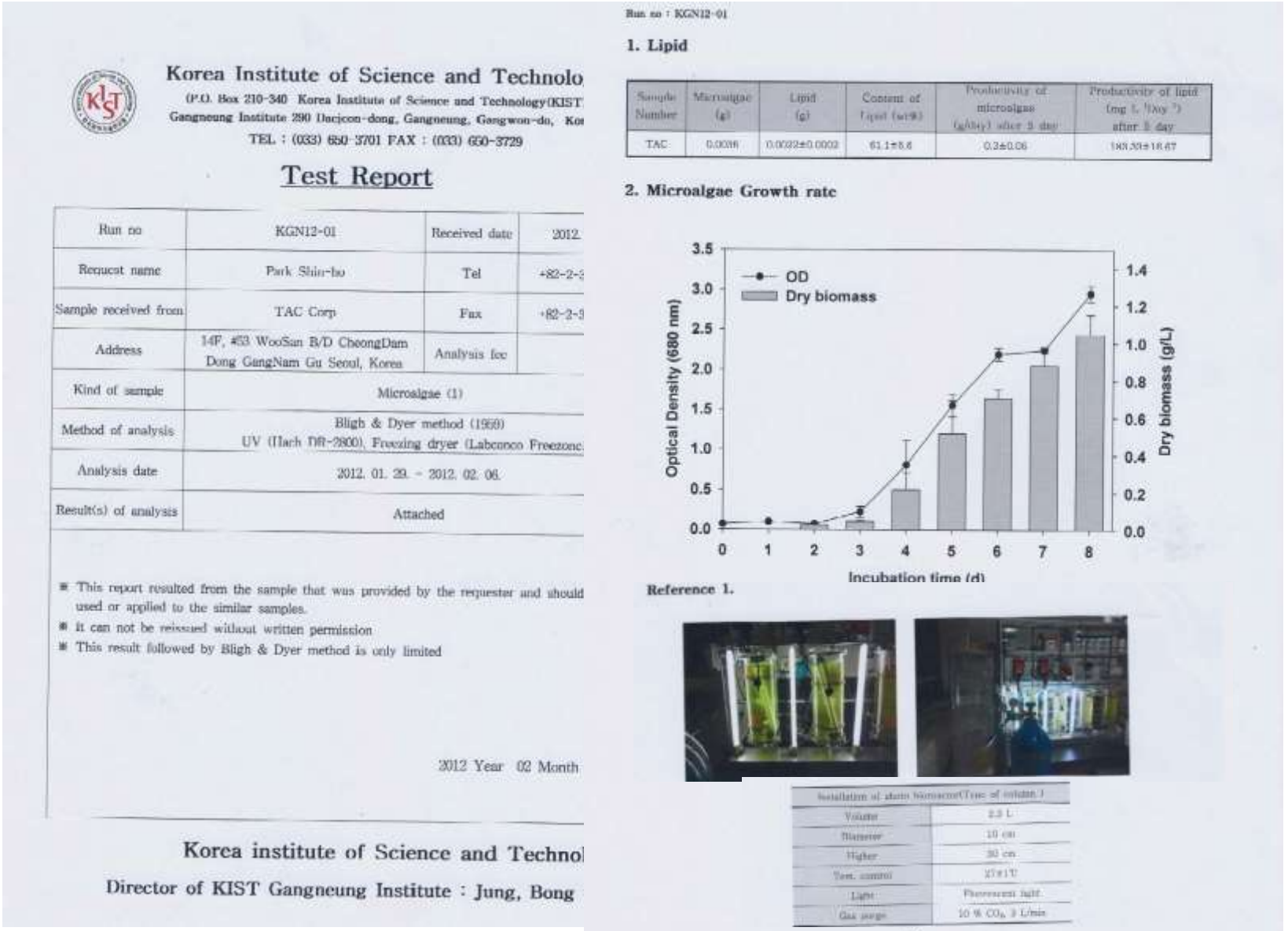
Why NGOSB's Algae Oil to fuel Renewable Energy Power Plant?



NGOSB'S ALGAE OIL PRODUCTION – RENEWABLE FUEL, CHEAPER TOO

We cultivate microalgae to produce renewable oils at a faster time to market and lower operating cost. We produce renewable oils at lower costs and greater quantity per hectare of land in the vegetable oils industry.

Endorsement from internationally accredited recognised institution, verifying & endorsing NGOSB's oil extraction from our A-MAP's algae biomass produce can go well above a high 60% crude algae oil extraction rate content & that our algae biodiesel is of the highest European EU quality specifications



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Gangneung Institute 290 Daejeon-dong, Gangneung, Gangwon-do, Ko
TEL : (033) 650-3701 FAX : (033) 650-3729

Test Report

Run no	KGN12-01	Received date	2012
Request name	Park Shin-ho	Tel	+82-2-3
Sample received from	TAC Corp	Fax	+82-2-3
Address	14F, #53 WooSan B/D CheongDam Dong GangNam Gu Seoul, Korea	Analysis fee	
Kind of sample	Microalgae (1)		
Method of analysis	Bligh & Dyer method (1959) UV (Hach DR-2800), Freezing dryer (Labconco Freezone		
Analysis date	2012. 01. 29. ~ 2012. 02. 06.		
Result(s) of analysis	Attached		

※ This report resulted from the sample that was provided by the requester and should used or applied to the similar samples.
※ It can not be reissued without written permission
※ This result followed by Bligh & Dyer method is only limited

2012 Year 02 Month

Korea institute of Science and Techno

Director of KIST Gangneung Institute : Jung, Bong

Run no : KGN12-01

1. Lipid

Sample Number	Microalgae (g)	Lipid (g)	Content of Lipid (wt%)	Productivity of microalgae (g/l/day) after 3 day	Productivity of lipid (mg L⁻¹day⁻¹) after 3 day
TAC	0.0036	0.0032±0.0002	61.1±8.6	0.2±0.06	188.89±18.87

2. Microalgae Growth rate

Reference 1.

Installation of photo bioreactor(Type of culture)	
Volume	2.3 L
Diameter	10 cm
Higher	30 cm
Tem. control	27±1℃
Light	Fluorescent light
Gas purge	10 % CO_2, 3 L/min

Algae Biodiesel Test Result

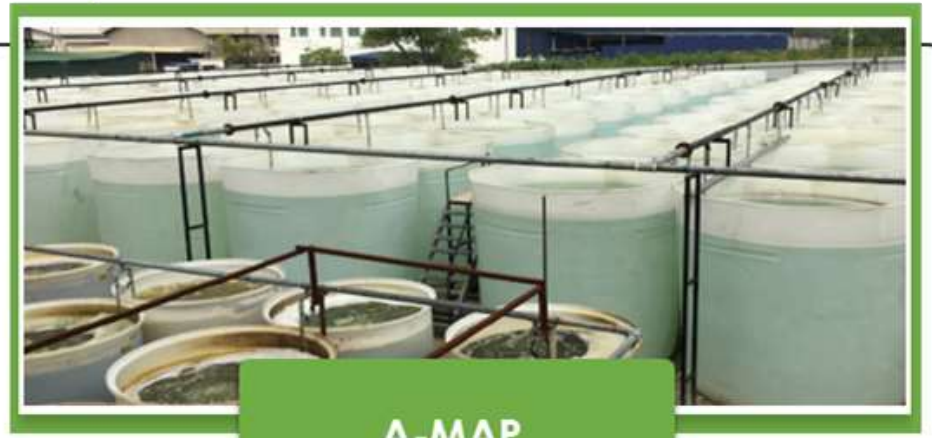
specification		standard	result
Ester content (weight%)		96.5 min	98.8
Flashpoint(°C)		120 min	170
Viscosity (°C, ㎟/s)		1.9 min ~ 5.0 max	3.3
Carbon Residue (weight%)		0.1 max	0.01 below
Sulfur (mg/kg)		10 max	4
Sulphated ash (weight%)		0.01 max	0.001 below
Cu corrosion max (50°C, 3h)		1 max	1a
CFPP (°C)		0 max	-6
Density (15°C, kg/㎥)		860 min ~ 900 max	894
Water (weight%)		0.05 max	0.05
Total contamination (mg/kg)		24 max	7
Acid value (mg KOH/g)		0.50 max	0.28
Total glycerol (weight%)		0.24 max	0.001 below
Monoglyceride (weight%)		0.80 max	0.001 below
Diglyceride (weight%)		0.20 max	0.001 below
Triglyceride (weight%)		0.20 max	0.001 below
Free glycerol (무게%)		0.02 max	0.001 below
Oxidation stability (110°C, h)		6 min	6
Methanol (mass %)		0.2 max	0.01 below
GP Metal (mg/kg)	Na + K	5 max	0.1 below
	Ca + Mg	5 max	5
Phosphorus (mg/kg)		10 max	4

EXXONMOBIL'S ALGAE PRODUCTION METHOD

Open Pond System

- Low initial capital
- Significant land use
- High contamination risk
- High operating cost
- Long lead time

NGOSB'S ALGAE PRODUCTION METHOD



A-MAP

- Low initial capital
- Optimal land use
- Contamination is rare
- Low operating cost
- Quick time to market

Patented System[1]

OTHER ALGAE PLAYER'S HIGH COST PRODUCTION METHOD

PhotoBio Reactor System

- Capital intensive
- Optimal land use
- Contamination is rare
- High operating cost
- Long lead time

NGOSB's Algae-Modular Automated Plantation ("A-MAP") adopts an algae cultivation & production patented system for which our high producing algae is grown in 2.6m high 10MT tanks, the aeration system provides CO_2 and circulation of microalgae to have uniform sunlight exposure in the photosynthesis process. Our location in tropical countries like in Malaysia, the algae production doubles its mass every 24 hours and harvesting is done on a daily basis through a automated machine. The algae is further processed into crude algae oil and crude algae cake.

NGOSB’s existing Algae Oil Cultivation & Production Facilities in Malaysia

Modular Installed Tanks With Aeration Lines Installed

Automated Nutrition Tanks Installed On Top Of The Harvester

Algae biomass is grown and produced on daily basis in each NGOSB’s A-MAP modular patented PE tanks, whereby, the algae mass collogulates in each tank, aided by blower machines that provides aeration, pumping CO2 into each tanks for algae biomass growth

Harvester (Patented system)

Automated Harvesting and Nutrition System

Harvester Buckets With Conveyor Belts

The daily algae biomass produced are then harvested & collected daily by NGOSB's patented A-MAP automated harvesting algae mass collecting hopper machines which harvests & collects algae biomass cost effectively from each modular PE tanks

Microalgae

Existing Facilities

Fresh Algae in Lab

Through NGOSB's patented A-MAP processing and cultivation system, collugation of high algae solid biomass content can clearly be seen

Extraction facility

Collection bucket for wet algae biomass being delivered

Oil extraction machinery (5T CAO per day)

The daily algae biomass produced and harvested are then collected in buckets and sent for algae oil extraction at nearby factory building via oil refining machine.

Frequently Asked Question:

How Scalable is the Algae Crude Oil Production by using A-MAP cultivation system?

Size of land needed (acres)	No. of algae tanks required for production (20 ft wide by 10 high)	Algae Crude Oil feedstock production per month by A-MAP (mt)	Size of renewable energy power plant(s) fueled by the quantity of Algae Crude Oil feedstock producion by A-MAP (MW/GW)
57 acres	40,000 tanks	10,000 mt per month	50MW
114 acres	80,000 tanks	20,000 mt per month	100MW
570 acres	400,000 tanks	100,000 mt per month	500MW
1,140 acres	800,000 tanks	200,000 mt per month	1 GW
5,700 acres	4,000,000 tanks	1,000,000 mt per month	5 GW
11,400 acres	8,000,000 tanks	2,000,000 mt per month	10 GW
57,000 acres	40,000,000 tanks	10,000,000 mt per month	50 GW
114,000 acres	80,000,000 tanks	20,000,000 mt per month	100 GW
570,000 acres	400,000,000 tanks	100,000,000 mt per month	500 GW

Next Gen Oil

Powered by Algae