



RONSER

Ronser Bio-Tech Berhad

POME to Energy Workshop

POME to Biogas

For Greener Ecosystem



**A Winner in 2015 Frost & Sullivan
Excellence Award in wastewater
Entrepreneurial Company**

**A Winner in International Excellence
Diamond Prize in Quality
Vienna , 2015**

By Dr Pua Eng Teck



RONSER

Content

- The Company
- The Technologies
- The application case
- The End

Company Overview

- * Incorporated 18th January 2008
- * Headquarters: Selangor, Malaysia
- * Key Management:
 - * Ms Woo Min Fong, Chairman
 - * Dr Pua Eng Teck, CEO & Executive Director
- * Number of employees: 24
- * Business activities: **Biological wastewater treatment and food waste treatment technologies**
- * Reference projects: **Jilin Ethanol (China Petrol), Pepsi Cola, Cola-cola Bottling Luanda (SAB Miller), China Resources Snow Beer, Wilmar Gresik**



- Ronser Bio-Tech Berhad (RONSER) was incorporated on the 18th Jan 2008 with the expertise of more than 30 years of hands-on experience of **Professor Zhang ZhenJia** in the forefront of integrated wastewater treatment solutions
- Ronser is the Commercial and Manufacturing arm of **Shanghai Jiao Tong University**
- This is a flagship company with Prof Zhang the biggest shareholder holding more than 20% of share.



Awards Received by Ronser

FROST & SULLIVAN



International Diamond Prize for
Excellence in Quality

WINNER



**1. Best Practises Award 2015
Malaysia Wastewater Treatment
Entrepreneurial Company**

**2. Recognized for the
superior development efforts**

**3. International Diamond Prize
Excellence in Quality 2015**



**4. The BrandLaureate SMEs BestBrands
Award 2015-2016
Corporate Branding, Best Brand in Green
– Water Treatment Technology**



**5. International Quality Summit Award 2016
Recognized for the contribution of RONSER
in term of Leadership, Quality, Innovation
and Excellence**

Strength in Leadership and Talent



Dato Rohailan
Senior Corporate
Finance Advisor

- Chartered Accountants



Woo Min Fong
Chairman

- Associate Member of the Malaysian Institute of Chartered Secretaries and Administrators



Izzadin bin Mohamed
Specialist in Facilities
Management

- MBA from Ireland and USA



Prof Zhang Zhen Jia
Chief Technical Advisor

- Over 30 years of relevant industry experience
- Dean of Environmental Science & Engineering (SJTU)



Prof Brett Neilan
New South Wales University

- Molecular biologist and microbial chemistry
- Expert in genetics of toxic bacteria and algae in water



Dr Ellie Luhah
Technical Advisor

- Over 35 years of experience forestry, agroforestry, aquaculture (Breeding of Empurau fish)



Dr Pua Eng Teck
Chief Executive Officer

- Over 24 years of experience in executive operations, dealership management and regional sales and marketing networking experiences.



Dr Wu WeiMing
Technical Advisor

- Over 25 years of relevant industry experience
- Senior Research Engineer, Stanford University, CA.



Dr Zhang YeJian
Chief Technical Officer

- Inventor of POME ZERO DISCHARGE



Dr Pang Haoran
Technical Advisor

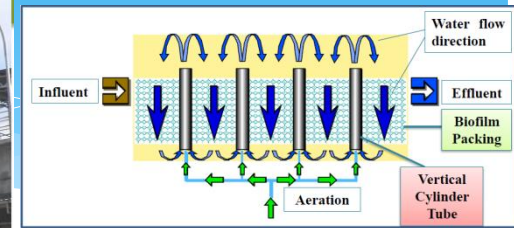
- PhD in Environment Engineering from INSA-Toulouse (France)

- ✓ Multi-cultural organisation focused on attracting and pooling talents globally
- ✓ Relationship with SJTU to tap its global expertise worldwide
- ✓ Focus on talent retention and succession planning to ensure suitable and competent staff on projects

| Qualifications | |
|-----------------|-------------------|
| 7 PhDs | |
| 4 Master Degree | 9 Bachelor Degree |
| 2 Diploma | 2 Professionals |

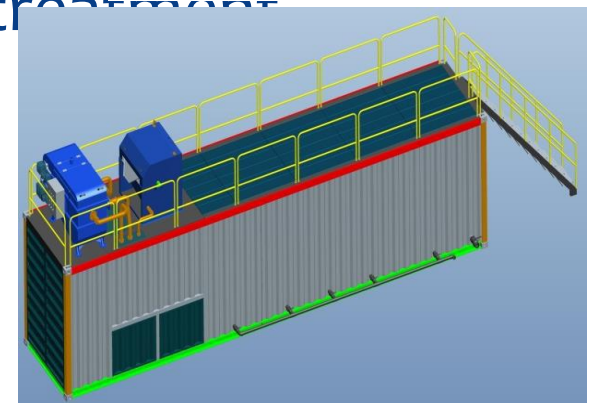
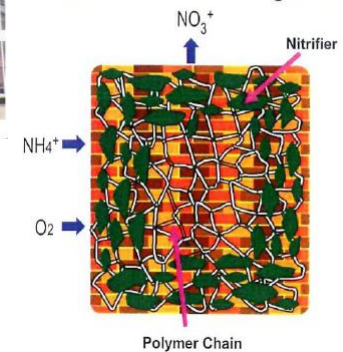
Ronser's Unique Capabilities

- * AnaEG (Anaerobic EGSB)
- * AnaCR(Anaerobic EGSB)
- * BioAX (Aerobic)
- * MBS (Ammonia Removal)
- * Integrated Modular system /Sewerage treatment
- * River and lakes wastewater treatment
- * SWED and solar system

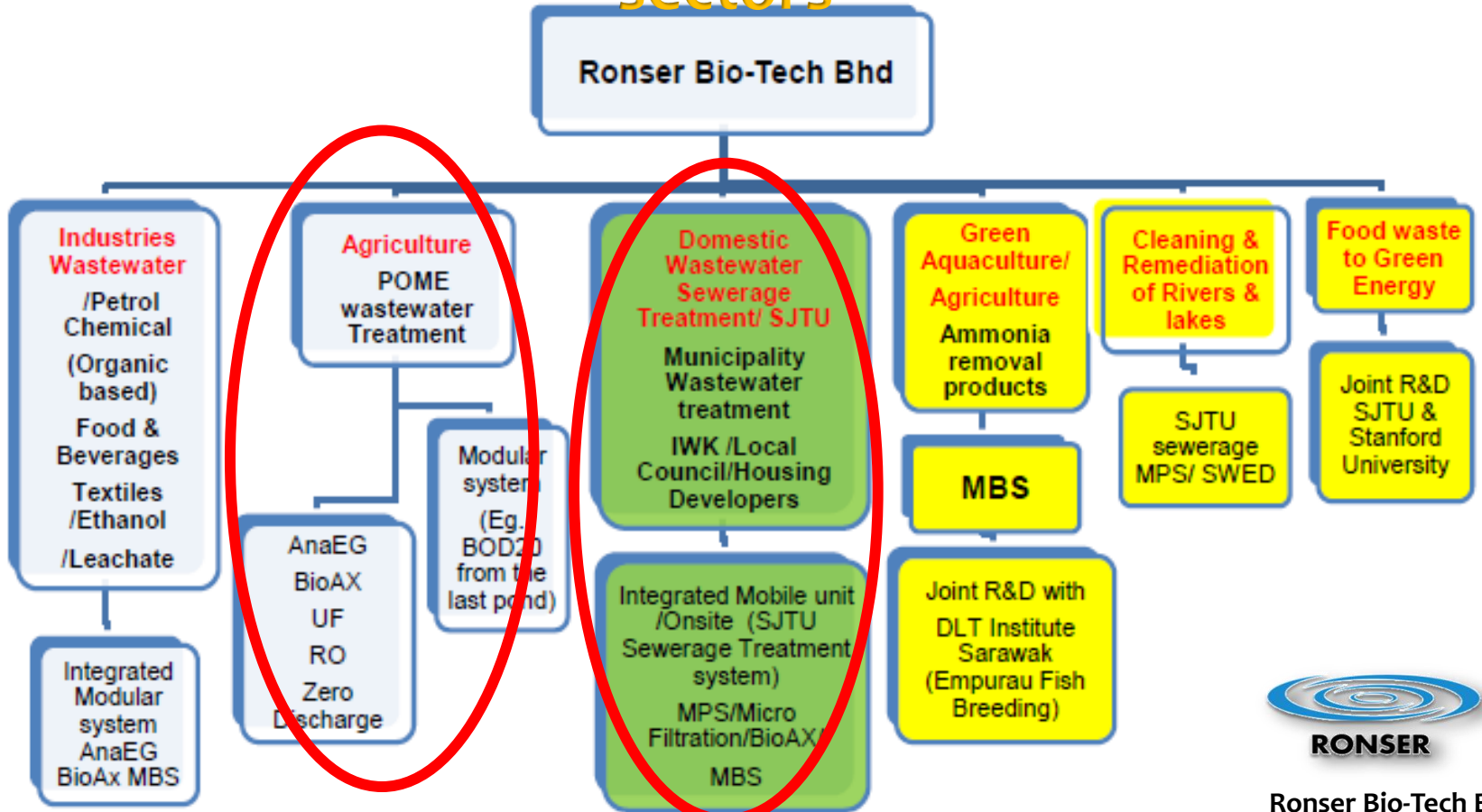


Schematic Diagram of the BioAX reactor

MBS Schematic Diagram



Ronser offers patented world class cutting edge wastewater treatment technologies that harness the unique value proposition of Green Environment, Sustainability, Renewable Energy, Water and ultimately **ZERO CARBON EMISSION** over a broad spectrum of sectors



RONSER's client



pepsi



康師傅



中国石油



TAL Group



BAOSTEEL



华润雪花啤酒(中国)有限公司



RONSER



RONSER BIO-TECH **SAVE** the Ecosystem

COLLABORATION WITH MALAYSIAN PALM OIL BOARD (“MPOB”) on 14 August 2009

Our deep appreciation to:

YANG BERHORMAT TAN SRI BERNARD G. DOMPOK,
Minister of Plantation Industries and Commodities

*for witnessing the signing of the Research and Development Collaboration Agreement
between
Malaysian Palm Oil Board, Shanghai Jiaotong University & Ronser Bio-Tech Sdn Bhd
for the commercial development of*

“Palm Oil Mill Effluent Zero Emission Technology”

*on the 14 August 2009
during the International Conference on Oil Palm and the Environment
organized by MPOB*



Far Left: Datuk Dr Mohd Baari Wahid, Director-General of MPOB, 3rd from left: Professor Zhang Zhenjia, Director of Shanghai Jiaotong University, centre: YB Tan Sri Bernard G. Dompok, 4th from right: Dato' Sabri Ahmad, Chairman of MPOB, 3rd from right: Ms Woo Min Fong, Chairman of Ronser.

RONSER



and



A pilot plant will be set up by Ronser and Shanghai Jiaotong University in the MPOB Palm Oil Milling Technology Center (POMTEC) in Labu, Negeri Sembilan. The technology involves an enclosed system covering an area of 2 acres which will convert the green house gas into renewable energy, discharged water treated approximate from BOD 25,000 ppm to BOD 20 ppm and to zero discharge if required. The plant is scheduled to be in operation by end March 2010.

The system qualifies the mill owner to apply for CDM under the Kyoto Protocol.





上海交通大学



PUSAT TEKNOLOGI HIJAU

PALM OIL MILL EFFLUENT ZERO DISCHARGE

GREEN TECHNOLOGY CENTRE

棕油厂废水零排放环保技术展示中心

March 2016

BIOTECHCORP



BIONEXUS
STATUS COMPANY

Palm Oil Mill Effluent ZERO Discharge



RONSER BIO-TECH **SAVE** the Ecosystem

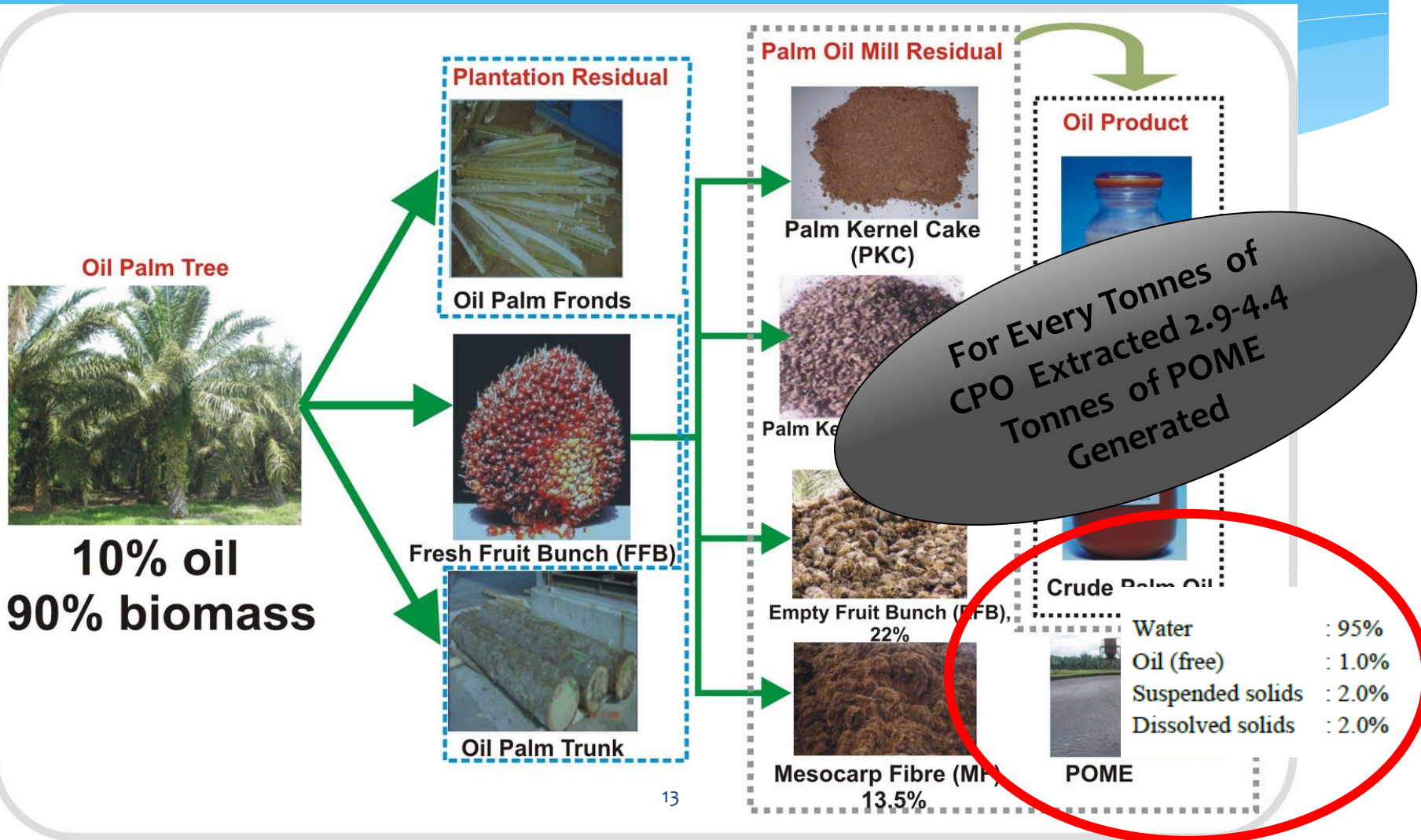
Ronser and MPOB has jointly filed for the patent of

“Zero Discharge Treatment System of Palm Oil Mill Effluent (POME)”

| | | |
|--|---|---|
| PCT | | <small>For receiving Office use only</small> |
| REQUEST | | International Application No. _____ |
| <small>The undersigned requests that the present International application be processed according to the Patent Cooperation Treaty.</small> | | International Filing Date: _____ |
| | | Name of receiving Office and "PCT" International Application: _____ |
| | | Applicant's or agent's file reference of document (if known) to this application: IPR/MM/GM/1/2012 |
| Box No. I | TITLE OF INVENTION | |
| | ZERO DISCHARGE TREATMENT SYSTEM OF PALM OIL MILL EFFLUENT (POME) | |
| Box No. II | APPLICANT <input type="checkbox"/> This person is also inventor | |
| Name and address: <small>(If more than one person is named, give the name and address of each person, and the address preferred for communications in respect of this application. Mark the name corresponding to the state of residence or nationality.)</small> | | Telephone No. _____ |
| RONSER BIO-TECH SDN BHD | | 603-7726899 |
| C708, METROPOLITAN SQUARE | | Facsimile No. _____ |
| BANDAR DAMANSARA PERDANA | | 603-77253300 |
| JALAN PJU 8/1 | | Applicant's registration No. with the Office _____ |
| 47820 PETALING JAYA | | |
| E-mail authorization: Mark one of the check-boxes below, authorizing the receiving Office, the International Searching Authority, the International Bureau and the International Preliminary Examining Authority to use the e-mail address indicated in this Box to send notifications issued in respect of this international application. <input type="checkbox"/> e-mail address if those offices are willing to do so. | | |
| <input type="checkbox"/> in advance copies followed by paper notifications or <input checked="" type="checkbox"/> exclusively in electronic form (no paper notifications will be sent). | | |
| E-mail address: _____ | | |
| State: MY (country of nationality) | | State where country of residence: MY |
| This person is: <input type="checkbox"/> inventor <input type="checkbox"/> applicant <input checked="" type="checkbox"/> both inventor and applicant <input type="checkbox"/> the United States of America <input type="checkbox"/> the State indicated in the Supplementary Sheet | | |
| Box No. III | FURTHER APPLICANTS AND/OR (FURTHER) INVENTORS | |
| <input checked="" type="checkbox"/> Further applicants and/or further inventors are indicated on a continuation sheet. | | |
| Box No. IV | AGENT OR COMMON REPRESENTATIVE: OR ADDRESS FOR CORRESPONDENCE | |
| The person identified below is hereby authorized to act on behalf of the applicant(s) before the competent authorities of the receiving Office. <input checked="" type="checkbox"/> agent <input type="checkbox"/> common representative | | |
| Name and address: <small>(If more than one person is named, give the name and address of each person, and the address preferred for communications in respect of this application. Mark the name corresponding to the state of residence or nationality.)</small> | | Telephone No. _____ |
| MANIAM MAHALINGAM | | 603-83226650 |
| IP RIGHTS (M) SDN BHD | | Facsimile No. _____ |
| NO. 7-M, BIZ AVENUE, NEO CYBER, | | 603-83202479 |
| LINGKARAN CYBER POINT BARAT, 63000 CYBERJAYA, | | Agent's registration No. with the Office _____ |
| SELANGOR DARUL EHSAN, MALAYSIA. | | PA 2005/0149 |
| E-mail authorization: Mark one of the check-boxes below, authorizing the receiving Office, the International Searching Authority, the International Bureau and the International Preliminary Examining Authority to use the e-mail address indicated in this Box to send notifications issued in respect of this international application. <input type="checkbox"/> e-mail address if those offices are willing to do so. | | |
| <input checked="" type="checkbox"/> in advance copies followed by paper notifications or <input type="checkbox"/> exclusively in electronic form (no paper notifications will be sent). | | |
| E-mail address: maniam@iprightsmalaysia.com | | |
| <input type="checkbox"/> Address for correspondence: Mark this check-box if there is an address for correspondence which has been appointed and the e-mail address is used instead to indicate a special address to which communications should be sent. | | |
| <small>Form PCT/RO/101 (first sheet) (January 2010)</small> | | <small>See Annex to the Request Form</small> |



Oil Palm Output /By Products



From Raw POME to Recycle Usage..



Conventional Ponding system

GHG

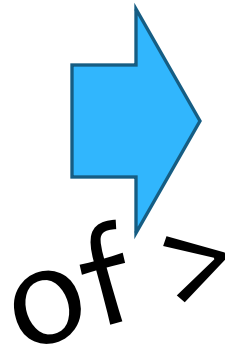


Thick
sludge



Large
Areas
occupy

Odour



of >

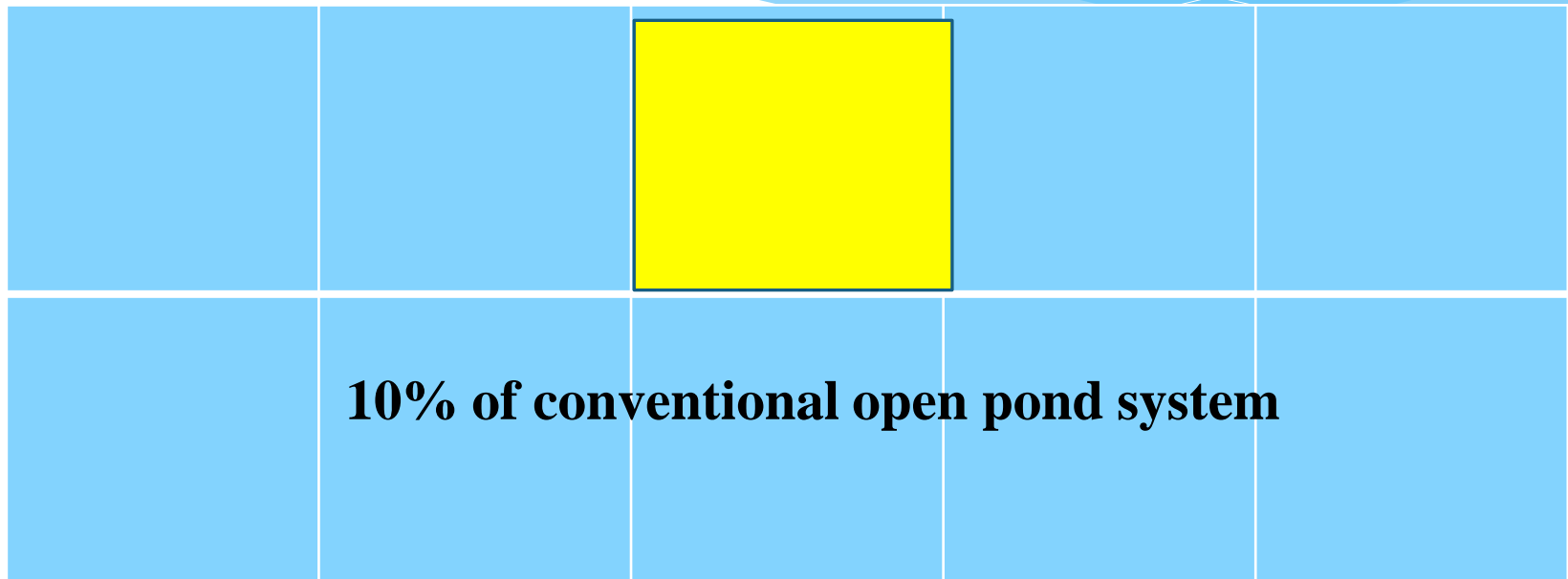
3-4 Months

BOD
Discharge
>100 ppm ??

Environment
Impact !!!

Air;
Water; Land

Ronser's Zero Discharge System Comparatively Smaller Footprint on Land Usage



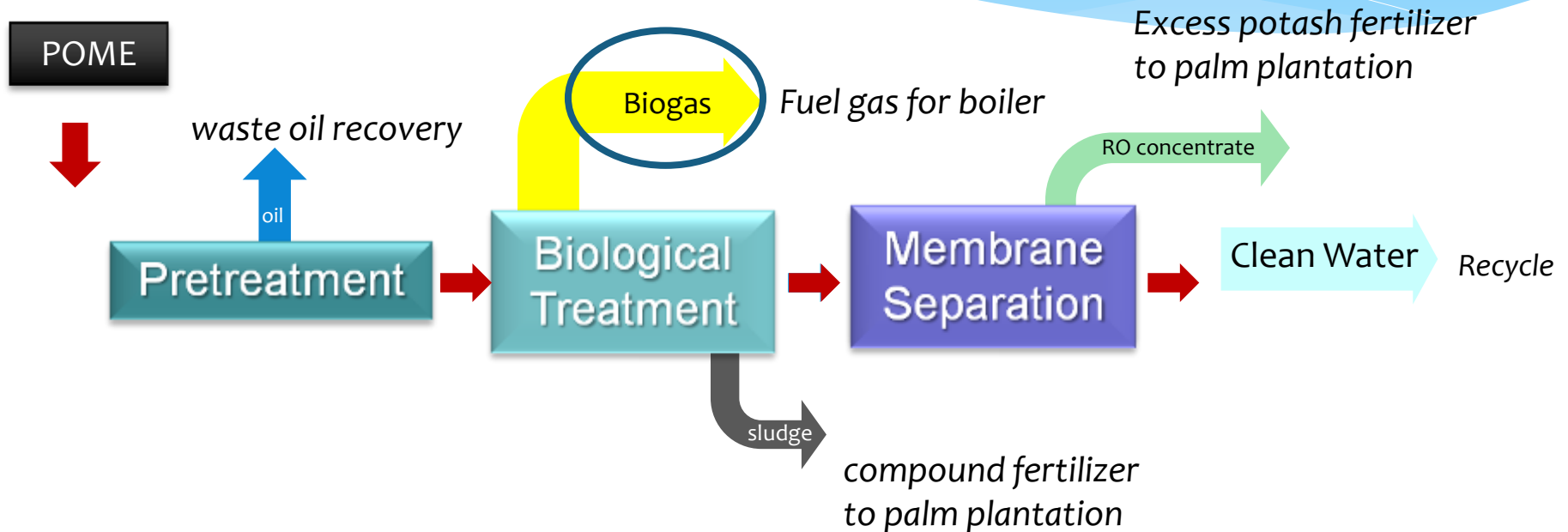
For a 60 tonne/ hr FFB mill, only 1 acre of land is required compared to the 10 acres in open pond.

Ronser's Zero Discharge System Comparatively Smaller Footprint on

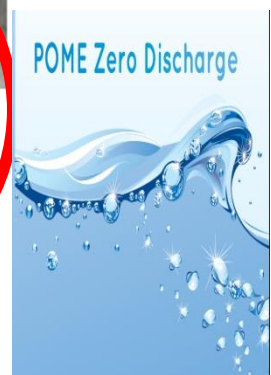
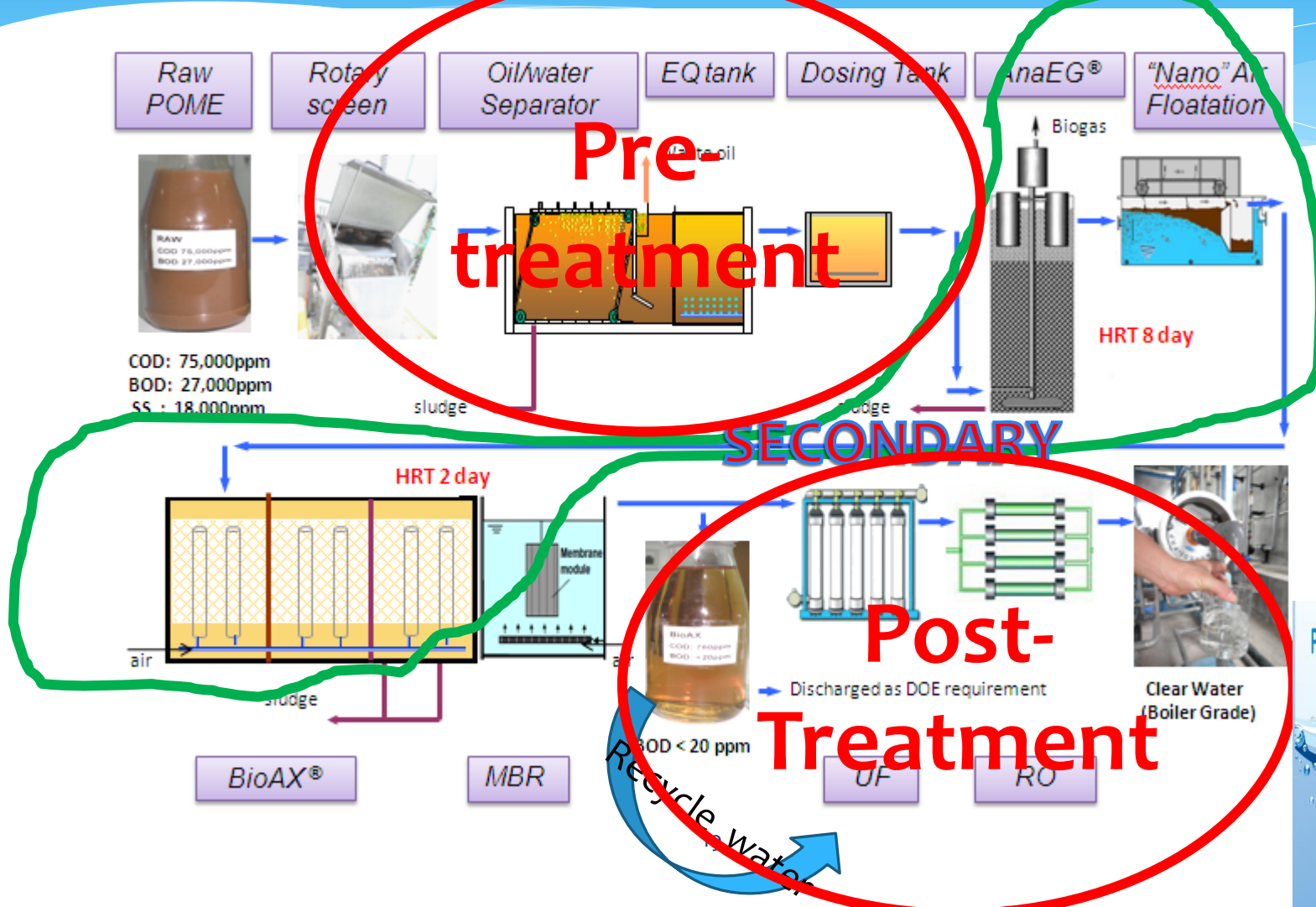


Ronser Zero Discharge POME Treatment Process

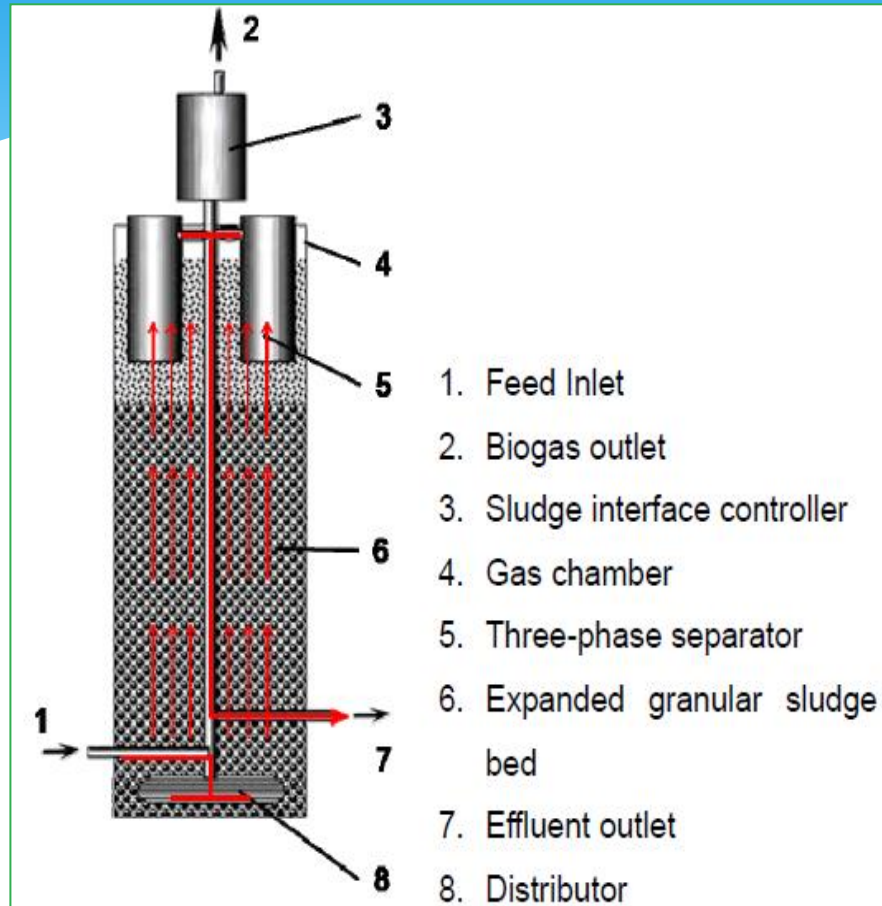
POME Treatment Flow Chart



Palm oil Mill Effluent (POME) Zero Discharge Treatment Process



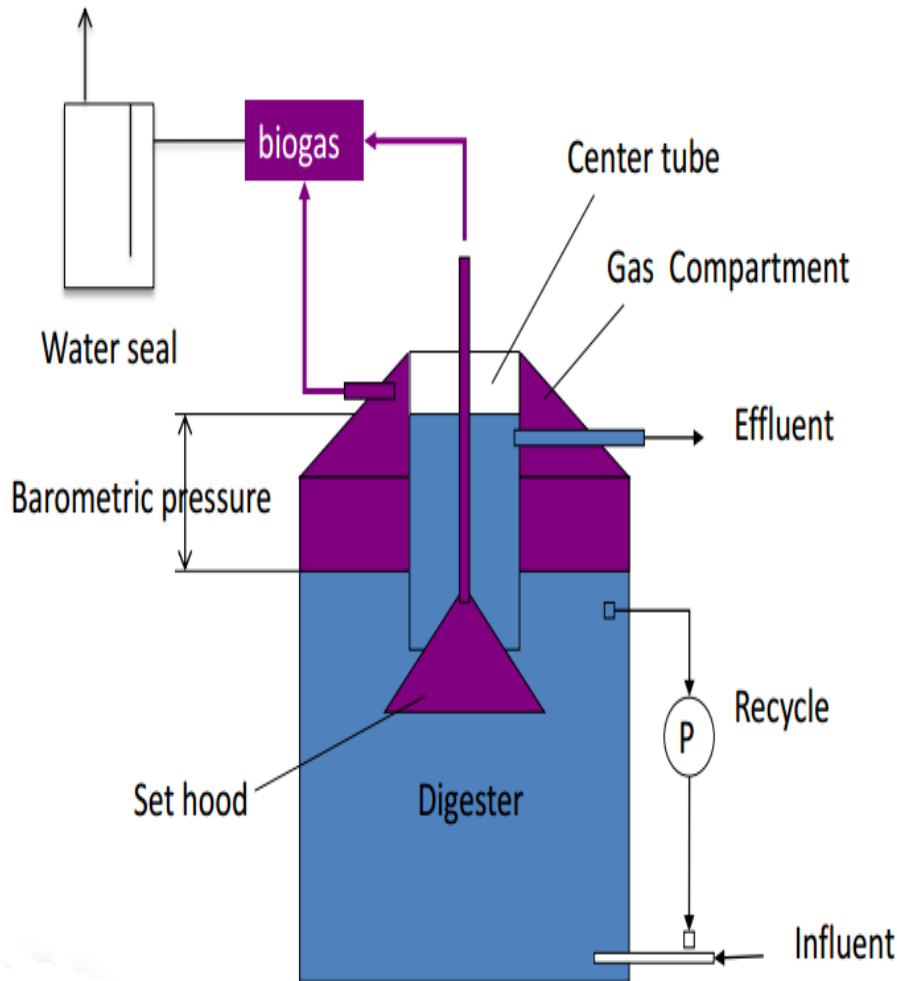
AnaEG



Schematic Diagram of the AnaEG reactor

- AnaEG is the third generation of high efficiency anaerobic biological process.
- It combines the advantages of UASB and EGSB technology in a simple and efficient process.

AnaCR



The system can produce maximum **35 m³ of biogas /m³** of POME, compare to other ordinary anaerobic digester which could only produce **20 m³** of biogas per M³ of POME

MPOB awarded Ronser a certificate to recognize AnaEG for its capability of producing **28 m³/m³** of Biogas POME. With the improved SJTU AnaCR, in order to generate **35 m³** of biogas/ m³ of POME is viable.

Newly invented biogas system.
Developed base on three type of anaerobic digesters: UASB, EGSB and CSTR.

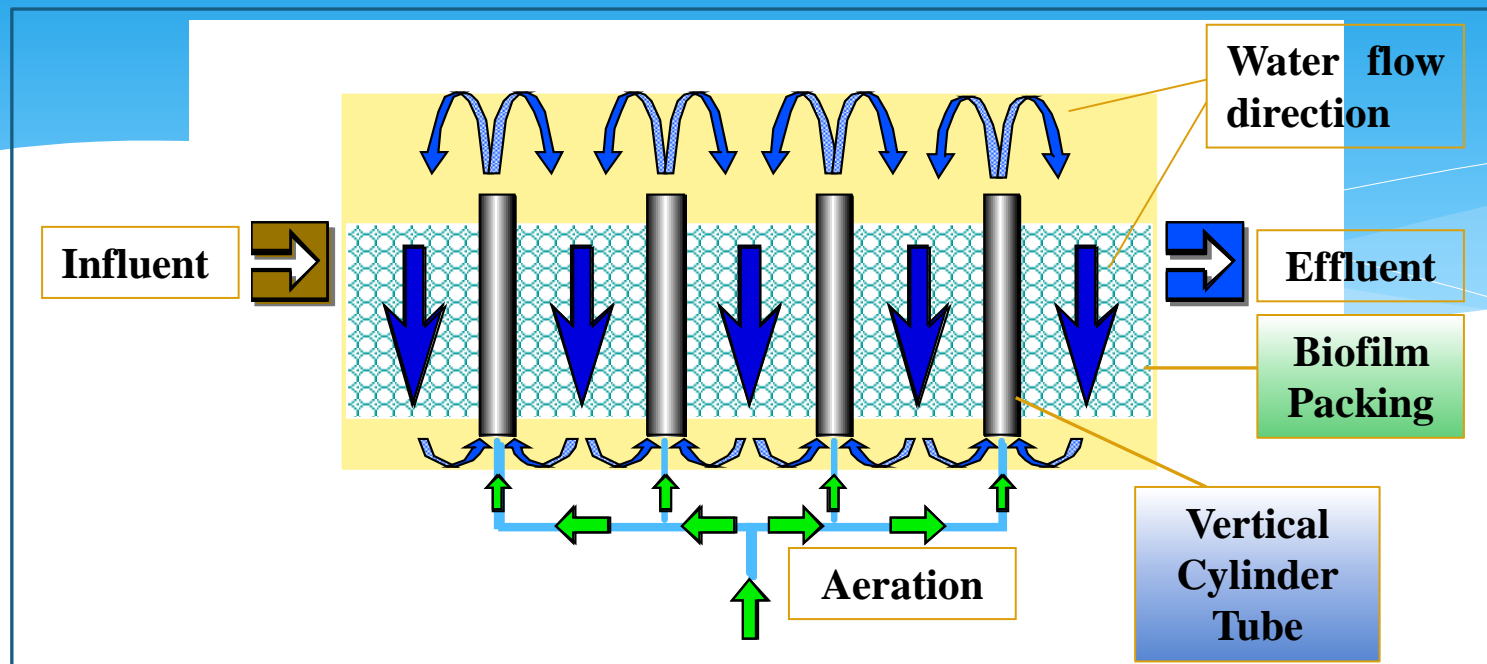
AnaEG



COD removal rate
81% - 85%

BOD removal rate
82% - 83%

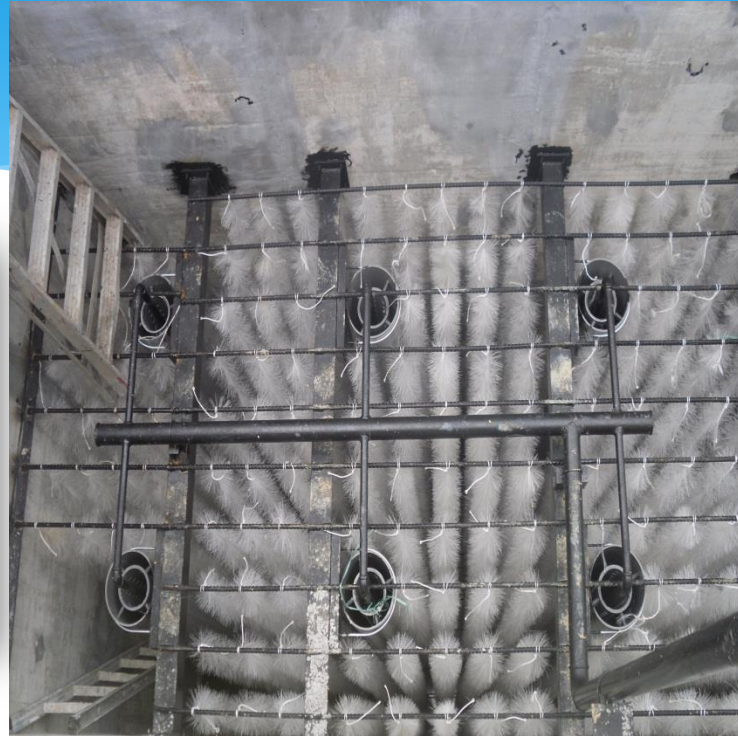
| Parameter | Raw Influent/EQ | After AnaEG | After Nano Air Filtration | After BioAX | After UF/RO (Permeate) |
|------------|-----------------|---------------|---------------------------|--------------|------------------------|
| COD (mg/L) | 65,000-80,000 | 10,000-15,000 | 2500-3000 | 700-800 | ND |
| BOD (mg/L) | 30,000-40,000 | 5,000-7,000 | 1,000-1,500 | Less than 20 | ND |



Schematic Diagram of the BioAX reactor

- BioAX is an advanced bio-contact (attached growth) aerobic process with internal circulation.
- Has been widely used in urban domestic sewage and industrial wastewater treatment.

BioAX



COD removal rate
72% - 73%

BOD removal rate
98% - 99%

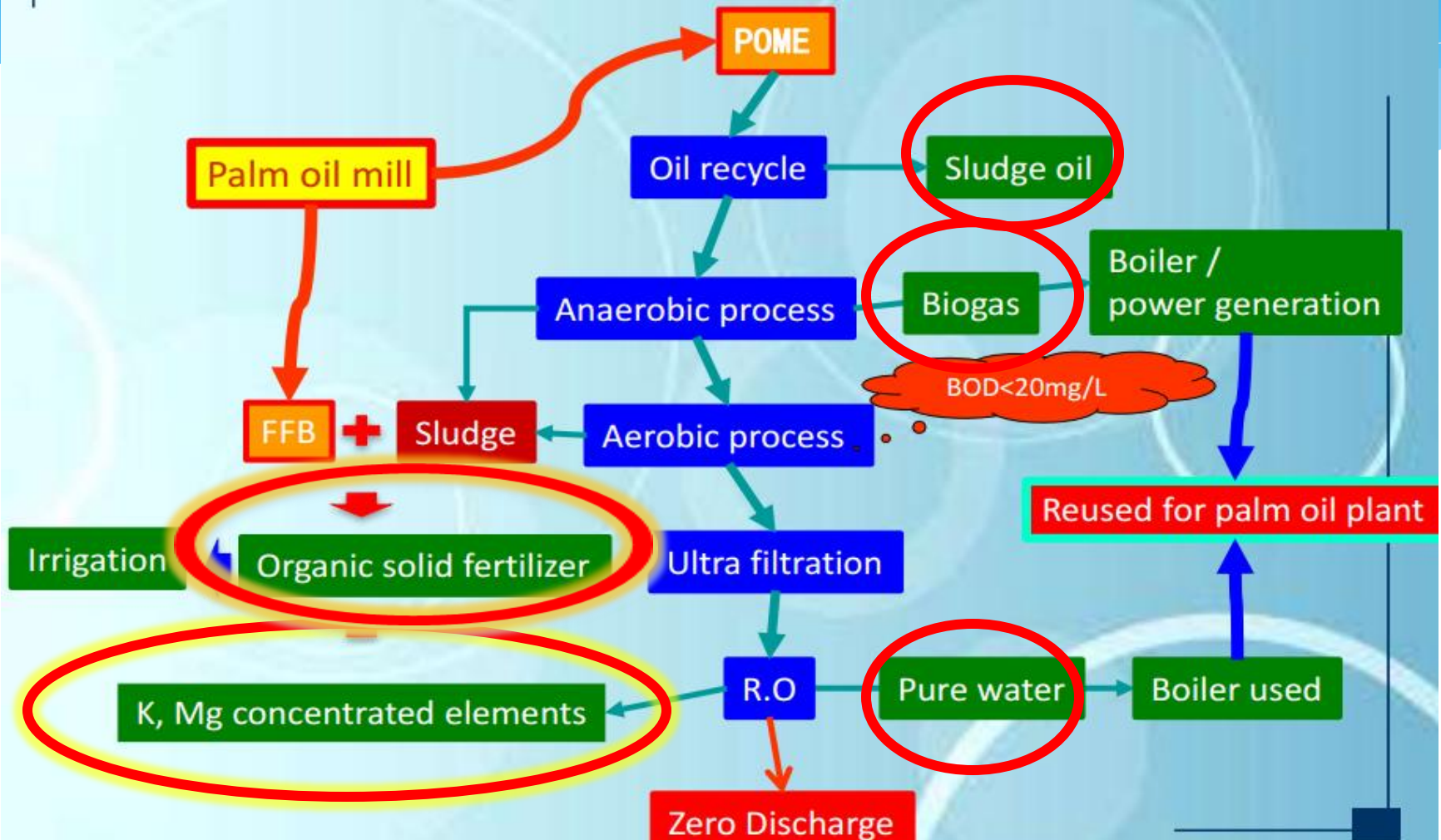
| Parameter | Raw Influent/EQ | After AnaEG | After Nano Air Filtration | After BioAX | After UF/RO (Permeate) |
|------------|-----------------|---------------|---------------------------|--------------|------------------------|
| COD (mg/L) | 65,000-80,000 | 10,000-15,000 | 2,500-3,000 | 700-800 | ND |
| BOD (mg/L) | 30,000-40,000 | 5,000-7,000 | 1,000-1,500 | Less than 20 | ND |

BIOAX AEROBIC TREATMENT BOD20



- **Higher treatment efficiency:**
80%~90%
- **Wider application:**
Industrial wastewater and Domestic sewage
- **Stable operation:**
Easy maintenance
- **Faster startup:**
Shorter microorganism cultivation time
- **No need for replenishment of micro-organism**
- **Lower power consumption:**
Lower blower capacity
- **Hydraulic Retention Time (HRT):**
35 hours
- **Lower sludge production:**
Comparing to activated sludge process

Zero Discharge



Malaysia's National Biomass Strategy 2020

National Biomass Strategy
2020: New wealth creation for
Malaysia's biomass industry
Version 2.0, 2013



Income:
30 Billion Ringgit

New Jobs:
66,000



Renewable Energy Target:
4000MW, 17%(2030年)



Palm Biomass in Malaysia

生物质型 Type of Biomass

kTons/a



油棕枝叶
Oil Palm Fronds

167,400



油棕树干
Oil Palm Trunks

55,200



空果串
Empty Fruit Bunches

20,000



纤维
Mesocarp Fibres

12,000



棕榈仁壳
Palm kernel Shells

4,800



棕榈油厂废水处理
Palm Oil Mill Effluent

5,7300

Collaboration between Ronser & Windbell



Windbell Technology to use the biogas generated by Ronser's technology for the production of biofuel from empty fruit bunch.



Bio-coal

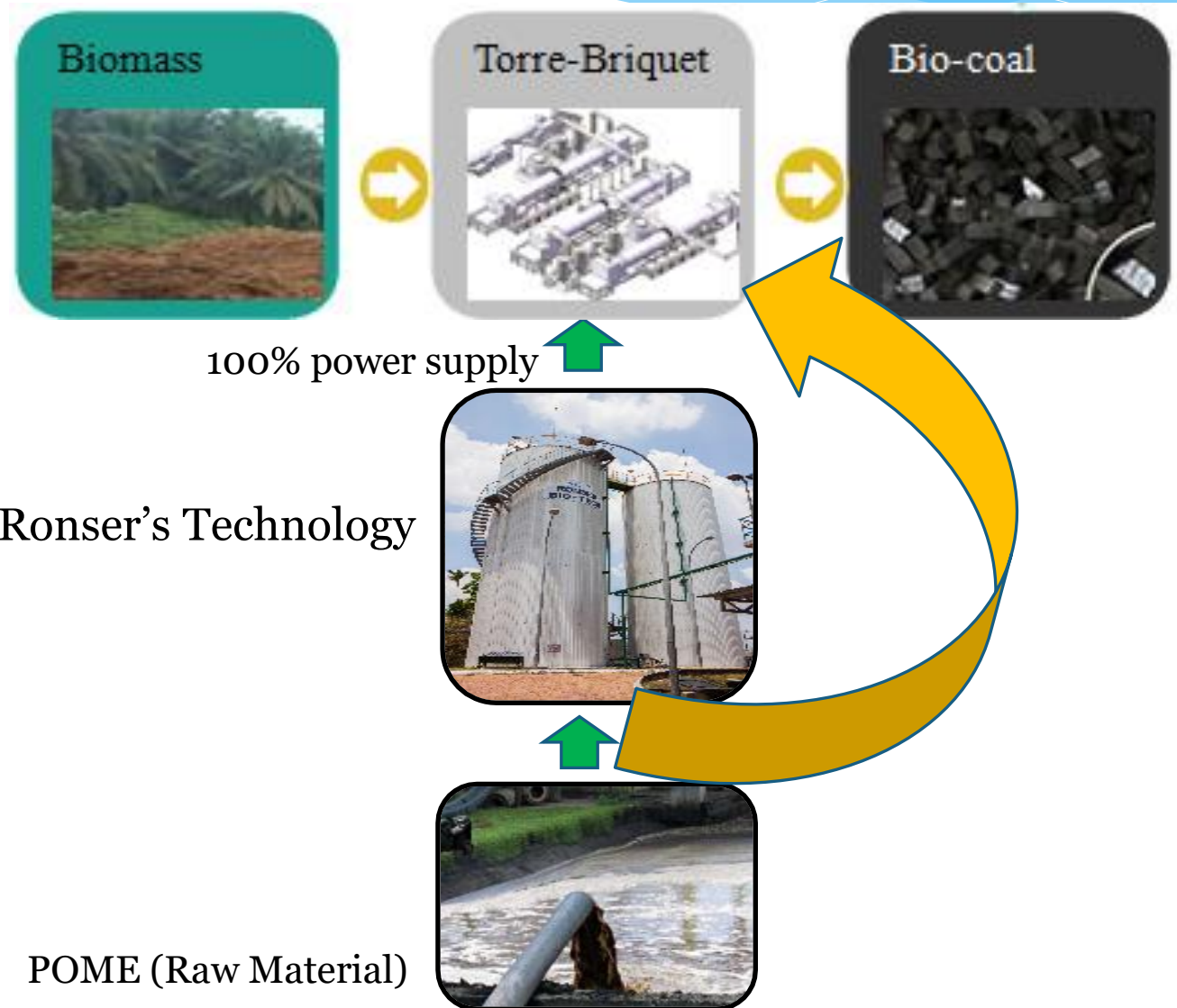


Bio-char

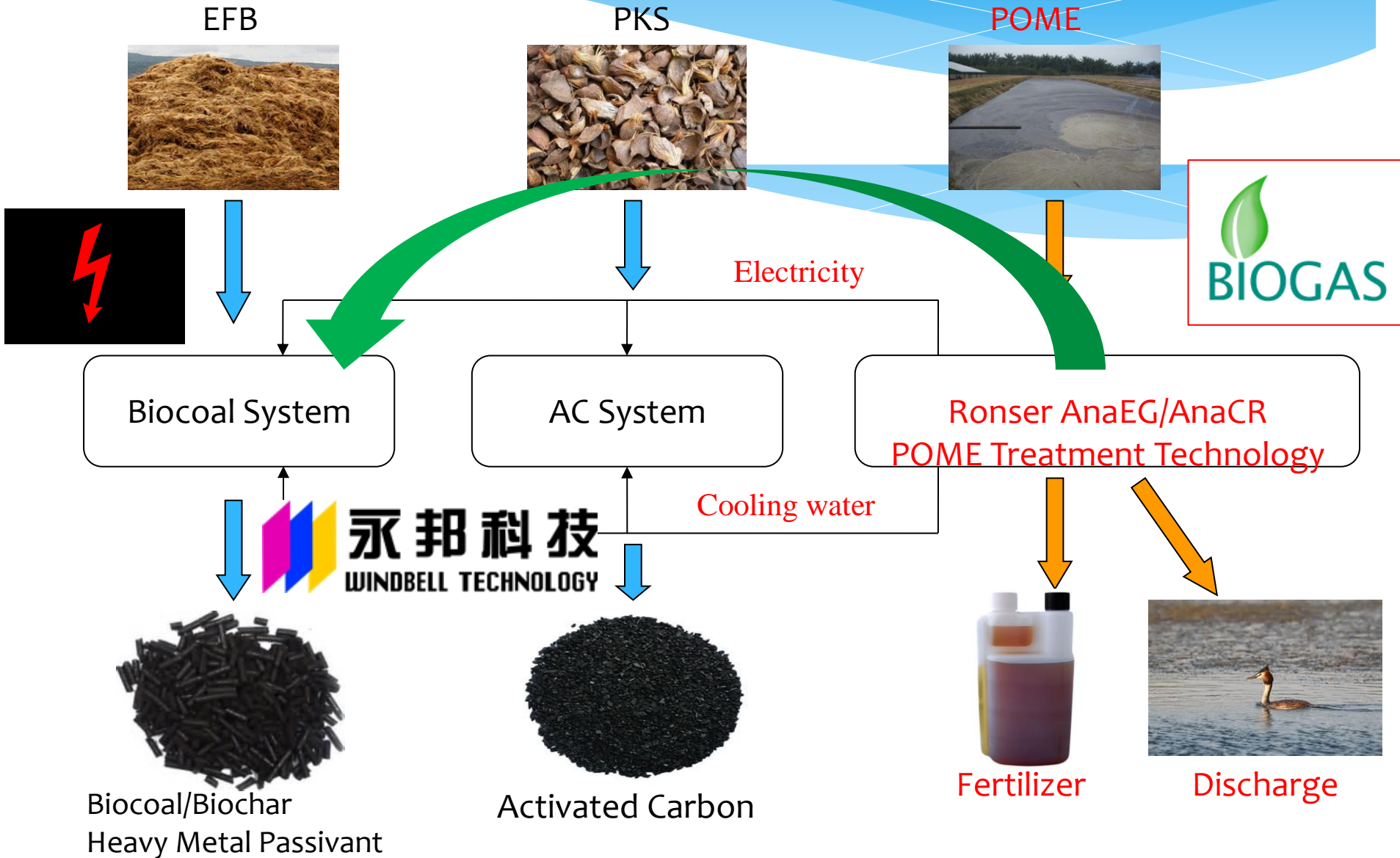


Biomass Pellets

Complete waste from Palm Oil Mill to Clean Energy



More Integrated Solution in Future



Top applications

- ✓ Breweries and beverage industry
- ✓ Distilleries and fermentation industry
- ✓ Food Industry
- ✓ Pulp and paper
- ✓ Palm Oil Mill
- ✓ Leachate landfill
- ✓ Ethanol
- ✓ Sauce
- ✓ Oleo-chemicals, fertilizer & palm oil refinery
- ✓ Livestock/poultry industry
- ✓ Domestic sewage

YTD close to 50's
projects successfully
completed in various
industries



Track record of Ronser's Technologies : completed projects



**Jilin Fuel Alcohol company –
Ethanol Plant Wastewater
(AnaEG®)**

Capacity: 8,000 m³/day
Completion: 05/2006



**LG-DAGU Chemical Company PVC
Mother Liquor Wastewater Treatment
(Recycling) Tian jin
(BioAx)**

Capacity: 3300 m³/day
Completion: 11/2001



**Pacific Apparel (Dongguan) Ltd -
Textile wastewater Recycling
(BioAX and MBR)**

Capacity: 750m³/day
Completion: 2013



**Coca-cola Bottling Luanda Angola
(SABMiller) – Beverage
Wastewater (AnaEG® and BioAX)**

Capacity: 3,000m³/d
Completion: 05/2010



**Wilmar - Gresik, Indonesia
(AnaEG®)**

Capacity: 1,700 m³/day
Under commissioning



**Hangzhou PuLuoXing Flour Co.,
Ltd - Starch Factory Wastewater**

Capacity: 1,000 m³/day

**YTD Completed close to 50 Industrial
Wastewater Treatment projects**



Ronser Bio-Tech berhad

Ronser's ZERO DISCHARGE SYSTEM

- * Meeting Standard A BOD <20 & beyond (DOE)
- * No greenhouse gas emitted into the atmosphere in open
- * Smaller footprint 1/10 (on the new set up)
- * Water recycled after RO for boiler usage
- * Recovery of residual oil.
- * Biogas is captured and used to generate electricity
- * Recover of Minerals Potassium, Magnesium, & Nitrates
- * Low operating and maintenance cost



From Raw POME to Recycle Usage..



- 1 Raw POME
- 2 AnaEG (Anaerobic) + Nana Air Floatation
- 3 BioAX (Aerobic)
- 4 Membrane Bio Reactor (MBR)
- 5 Ultra Filtration (UF)
- 6 Reverse osmosis (RO)



Thank you



RONSER

www.ronserbio.com

RONSER BIO-TECH BHD