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# THE SUSTAINABILITY IMPERATIVE IS RESHAPING INDUSTRIAL & MANUFACTURING PROCESSES



Leaf Resources is a global technology leader in green chemistry



#### THE MARKET OPPORTUNITY IS SUBSTANTIAL - GROWING TO \$100 BILLION



Growing consumer push for sustainable products & new, tighter regulations around the world



84 major US companies
– including Coca Cola
& McDonalds – have
pledged to eliminate
petroleum sourced
products from their
supply chain<sup>1</sup>



The European Union has committed to making all plastic packaging recyclable by 2030<sup>2</sup>

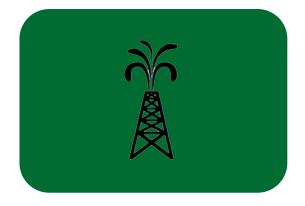


The global market for green chemistry – which includes biobased chemicals, green polymers & less-toxic chemical formulations – is projected to grow from \$11 billion (2015) to nearly \$100 billion (2020)<sup>3</sup>

- 1. Financial Times, January 2018 / EcoWatch, January 2018
- 2. European Commission, January 2018
- 3. Report for the American Sustainable Business Council & Green Chemistry & Commerce Council. Prepared by Trucost Consulting April 2015



#### WHAT IF WE COULD....



Remove petroleum from the supply chain



Replace plastics with bioplastics



Produce biodegradable, recyclable packaging

# Plus do all this on a sustainable & more cost efficient basis

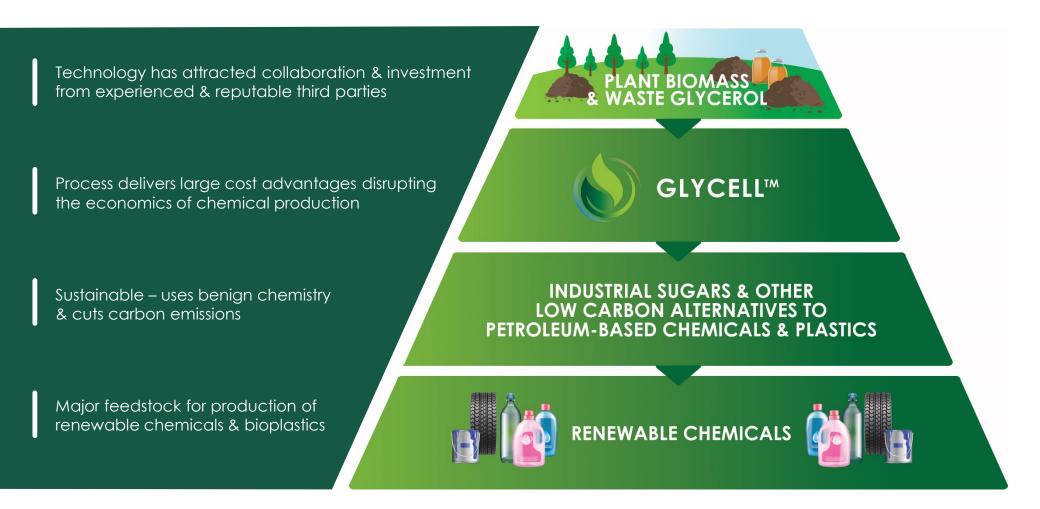


#### WE CAN... IT'S CALLED A BIOREFINERY

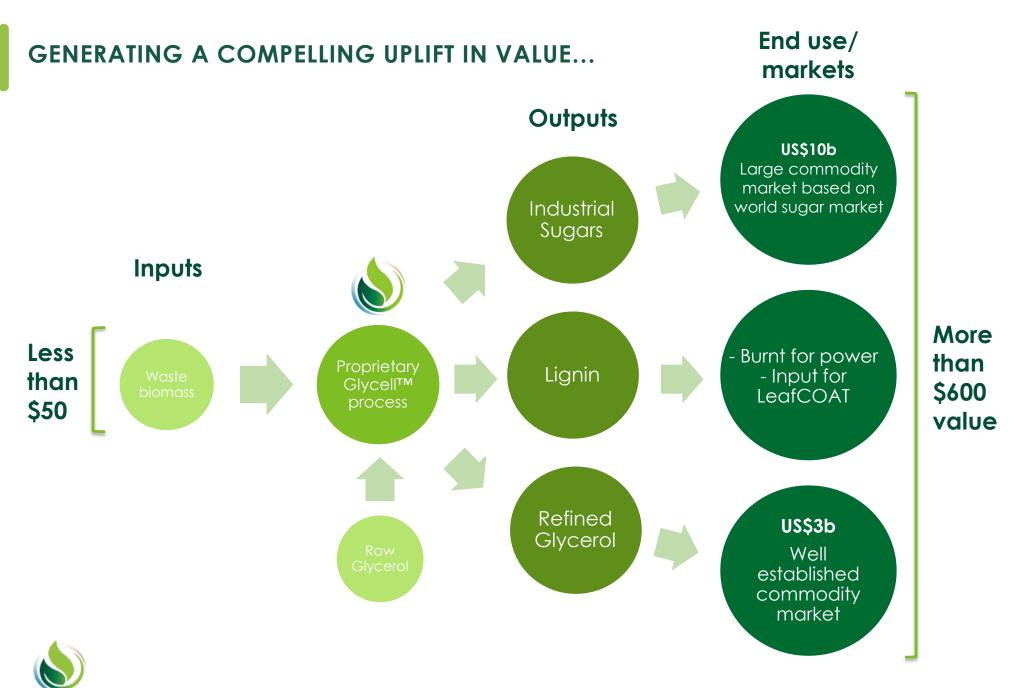


Leaf is making positive progress towards the establishment of a biorefinery in Malaysia incorporating its proprietary Glycell™ technology

## LEAF'S GLYCELL™ PROCESS CONVERTS PLANT BIOMASS INTO INDUSTRIAL SUGARS, LIGNIN & REFINED GLYCEROL







## IN LATE 2016 MALAYSIA WAS CHOSEN AS THE PREFERRED LOCATION FOR THE FIRST BIOREFINERY INCORPORATING GLYCELL™ TECHNOLOGY

#### **NATIONAL BIOMASS STRATEGY**

- Create 66,000 jobs
- Increase GNI by RM30b by creating high value products
- Reduce carbon emissions 12%

#### **GOVERNMENT SUPPORT/INCENTIVES:**

- Strong support for Leaf from numerous key government agencies including AIM, MIDA, MPIC & the Malaysian Bio-economy Development Corporation
- Tax incentives under a number of schemes

#### PLENTIFUL BIOMASS...AND AT A LOW COST:

- Johor produces 3.4 million MT of EFB per year neighboring Pahang similar
- 52 palm mills within 120 km produce greater than 3.5 million MT pa of EFB
- The project needs 200,000 MT pa

#### **GLYCEROL**:

Malaysia has a biodiesel mandate therefore glycerol is produced





#### **CLAERIS COLLABORATION**



Joint development company owner – 80% Leaf, 20% Claeris

Five project deal with all projects to be financed externally to Leaf Resources balance sheet

Revenue will be generated by developing, licensing & operating biorefinery projects







Claeris' prior projects have generated IRRs >300% & created >\$800m equity



Proving technology/ engineering design	Independent testing (350 hours)	External validation	Phase 2 IDS	Phase 3 IDS	FEL 3 (engineering)				
Identifying & securing site & feedstock supply	Project management agreement (Claeris)	Preferred country location	Site selection	Preliminary agreement on utilities, EFB supply	Site option agreement executed	Glycerol supply preliminary agreement	Final utilities agree- ment	Final EFB agree- ment	Final glycerol agree- ment
Government & regulatory approvals	Key government agency support letters	Manufac- turing license	Tax exemption application	Tax exemption approval	Environmental approvals	Final Govern- ment approval			
Proving economics & feasibility	FEL 1	FEL 2	Independ- ent feasibility	FEL 3	Bankable feasibility				
Project financing	New energy risk insurance	TDA application	Investment structure	Project financing document ation	Debt secured	Equity secured			
Identifying & securing offtake customers	Testing of sugars	Phase 2 IDS samples	Glycerol offtake agreement	LeafCOAT samples	MOU for sugars offtake (Petronas)	Final contracts executed			



Completed up to October 2017

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Current timetable facilitates a commencement of construction in last quarter of CY2019

## INDEPENDENT STUDY BY INTERNATIONAL ENGINEERING FIRM AURECON – COMPLETED JUNE 2018

#### Confirms technical feasibility and strong project economics

Refinery capable of producing multiple high value products

Segamat site 'ideally suited' to biorefinery project

All major environmental impact assessment approvals achievable

Leaf's team includes experienced project managers

Capital cost: \$146m (\$178m if utilities included)

Base case (50% debt)<sup>1</sup> — Cash flow<sup>2</sup> \$47m IRR 31%

"THE WORLD MARKET
FOR BIOPRODUCTS IS
RAPIDLY CHANGING AS
CONSUMERS DEMAND
CLEANER, SAFER &
BIODEGRADABLE
OPTIONS FROM THE
CURRENT
HYDROCARBON-BASED
PRODUCTS."

**Aurecon study** 



<sup>&</sup>lt;sup>1</sup> See full ASX announcement – 13 June 2018

<sup>&</sup>lt;sup>2</sup> Before debt repayments

#### MALAYSIAN PROJECT STATUS

#### FINANCE OPTIONS



#### **OFF BALANCE SHEET OPTIONS**

- The Technology Development Authority has US\$11.2b of funds for deployment on approved projects
- Leaf has formally applied to TDA for approval
- If successful Leaf may retain a substantial share of the economic profit of the Segamat project for minimal capital input



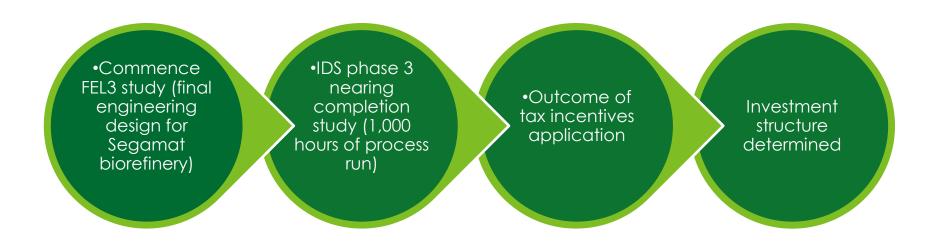
#### **NEW ENERGY RISK**

- New Energy Risk specializes in technology performance insurance and has a strong track record in underwriting waste-toproduct technologies
- New Energy Risk is a Managing General Underwriter & subsidiary of XL Catlin (NYSE:XL) plc, a global insurer & reinsurer which maintains a financial rating of S&P "A+"
- Positive discussions re underwriting for the Malaysian project utilising Leaf's technology have commenced



#### **KEY MILESTONES / OBJECTIVES FOR NEXT SIX MONTHS**

LEAF IS PURSUING A DISCIPLINED BUSINESS PLAN & CONTINUES TO MEET KEY MILESTONES AS IT PROGRESSES TOWARDS COMMERCIALISATION OF THE GLYCELL™ TECHNOLOGY & LEAFCOAT™; BOTH OF WHICH ADDRESS SIGNIFICANT & GROWING GLOBAL MARKETS



OCTOBER 2018 MARCH 2019



## MANAGEMENT & BOARD CHANGES THAT STRENGTHEN OUR TECHNICAL & COMMERCIAL CAPABILITIES; STRATEGIC FOCUS & GOVERNANCE

### CEO transition

- 1 February 2019 Alex Baker to become CEO of Leaf Resources
- Alex is a "co-founder" of Leaf long association with the Company
- Vast technical experience in the field
- Extremely strong commercial skill
- Excellent knowledge of the market place
- Ken Richards will remain a Board member & undertake special projects for Leaf

#### Board renewal

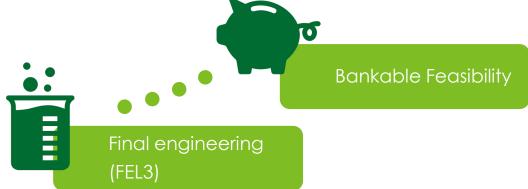
- 1 April 2018 Doug Rathbone commences as Chairman
- Doug is former CEO of Nufarm global ag inputs company
- Doug is a former Non Executive Director of CSIRO
- Doug leads a strong board with appropriate experience & skills in Leaf's market



#### A CLEAR PATH TO COMMERCIALISATION...

Leaf has established a strong track record of positive progress with key trackable milestones towards:







#### A SUSTAINABLE SOLUTION THAT WILL GENERATE SUBSTANTIAL VALUE



Glycell™ replaces of petrochemicals by renewable chemicals & bioplastics



Addresses a large & growing market driven by consumer, government & corporate demand



Malaysian project – construction expected Q4 2019



Attractive economics that generate high margins





#### **CONTACT**

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#### TECHNOLOGY INDEPENDENTLY VALIDATED



Leidos Engineering confirms feasibility of Glycell™ process



25%<sup>1</sup> higher than rival technologies, independent tests





Aurecon confirms technical feasibility & strong project economics



>350 hours of successful testing at Andritz facility in Ohio









#### TECHNOLOGY IS VALIDATED OVER MANY HOURS OF TESTING

1. Leaf Resources ASX announcement, 4 April 2016



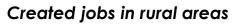
#### **WORLD CLASS PARTNERS**

PARTNER	EXPERTISE	AGREEMENT	RESULTS
ANDRIZ	A global leader in supply of plant, equipment & services for pulp, paper & other industries. More than 250 sites worldwide, staff of ~25,700 & market cap of ~EUR4.5 billion	Collaborative testing at Ohio facility & equipment supply	Joint study to establish suitability of empty fruit bunch (EFB) as key feedstock.
novozymes	World leader in biological solutions & largest producer of enzymes with US\$2 billion in sales, 65,000 employees in 140 countries & market cap ~ US\$15 billion	Collaborative research agreement	Development of industrially tailored enzymes to support Leaf's Glycell <sup>TM</sup> manufacturing process.
ARI	Amalgamated Research LLC (ARi) – process research & development company specialising in creation & management of innovative technology from lab & pilot studies to full-scale industrial implementation	Collaboration with Ari to use its facilities for extensive testing of the chromatography separation on the Glycell <sup>TM</sup> process	Leaf uses chromatography from ARi to separate the glycerol & C5 sugars.
Claeris	World class project developer with a proven track record of developing large-scale, financially successful renewable projects	JV for five projects (see next page)	US\$500k investment in Leaf; project management support.



## LEAF'S BIOREFINERY PROJECT ADDRESSES KEY UNITED NATIONS SUSTAINABILITY GOALS











Turned waste into value



Saved carbon and energy in the process



#### BIODEGRADABLE, RECYCABLE & RENEWABLE

# RENEWASILE ACCYCLABLE

#### LeafCOAT™

- Enhances Leaf's economics using lignin & glycerol from the Glycell™ process
- Exclusive license: USA, Canada, Brazil & Malaysia

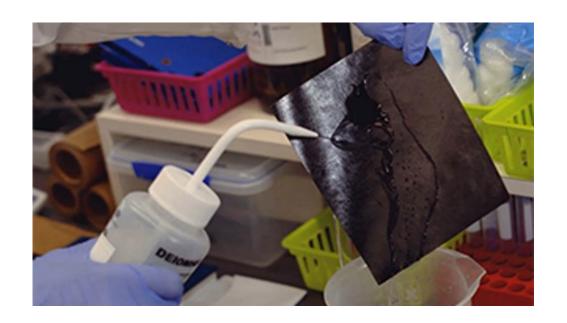
#### A MARKET THAT IS LARGE & GROWING FAST:

- Global biodegradable packaging market is worth US\$5b
- Growing to US\$14b by 2022 (17% CAGR)

#### **ADDRESSABLE MARKETS**

- · cardboard box coating,
- food contact including coffee cups
- · Mulching and
- strengthening recycled cardboard

#### OPPORTUNITY FOR SHORT TERM CASHFLOW





#### STRONG MANAGEMENT TEAM WITH GLOBAL EXPERTISE



**KEN RICHARDS**Managing Director

Ken Richards has over 30 years of experience as a Managing Director in listed & unlisted companies across the agriculture, finance & technology sectors. He has a track record in managing, transitioning & growing companies. During his life as a public company CEO Ken has completed transactions, takeovers & capital raisings, in excess of A\$200M. Ken holds Bachelor of Commerce & Master of **Business Administration** dearees from the University of WA. He is a fellow of the Australian Institute of Company Directors.



JASON LOWRY
Chief Operating
Officer

Jason holds a Bachelor of Chemical Engineering from Montana State University, has completed an MBA and is also a Fellow of the Australian Institute of Company Directors. He is also an affiliated member of the American Institute of Chemical Engineers and the American Chemistry Society. He has over 15 years in senior management roles working for large multinationals in the sugar and sweetener industries such as Caraill, American Crystal Sugar and Mackay Sugar Limited (QLD). His experience includes working with enzymatic conversions and SMB chromatography process and production of chemicals by fermentation processes.



TIM PRITCHARD
Finance Director &
Company Secretary

Tim Pritchard ioined Leaf Resources in 2017 as Chief Financial Officer & Company Secretary. Before joining Leaf Resources, Mr. Pritchard was most recently engaged as the Chief Financial Officer & Company Secretary of ReNu Energy, an ASX listed renewable energy company. Mr. Pritchard has over 20 years management experience in finance, accounting, consulting, project management & information technology. His qualifications include: B.Bus, MCom, MIT, CPA, GIA (Cert).



**DR LES EYDE**Technology Director

Les Edve has 25 years professional experience in research & development in Australia & the US. He is internationally recognized as an expert in liquid biofuels & biomass. Since 2007 he has held the position of National Task leader. International Energy Agency, Bioenergy for Commercialisina Advanced & Conventional Liquid Biofuels from Biomass. Les has a PhD in carbohydrate chemistry, expertise in biofuels production processes & sustainable biomass supply. He is the author of over 90 peer reviewed journals & conference proceedings.



BRIAN O'NEIL Senior Process Engineer

Brian O'Neil is a process engineer, who joined Leaf Resources after five years in biofuel & biochemical production process development at a plant similar to Leaf's proposed Malaysian plant. He has expertise in process development & optimisation. scale-up from lab to commercial, equipment design, process integration, project management. facility start-up, & highvolume processing & manufacturing operations. He holds a Bachelor of Science in Mechanical Engineering from Michigan Technological University with minor studies in materials & metallurgical engineering.



#### EXPERIENCED BOARD OF DIRECTORS WITH COMPLEMENTARY SKILLSET



DOUG RATHBONE Chairman

Doug is a chemical engineer by profession, served as Chief Executive Officer & Managing Director of Nufarm Limited from 1982 to 2015. Under his leadership Nufarm transformed itself from a \$20m business to one with more than \$2 billion in sales as it became one of the world's leading crop protection & seed companies. He is currently Chairman of Rathbone Wine Group, a director of Cotton Seed Distributors & AgBitech. He is a former Director of the CSIRO.



MATTHEW MORGAN
Director, Chairman of
Audit Committee

Matthew has over 10 years of executive management experience in private equity funded portfolio companies & venture capital at Queensland Investment Corporation. He is experienced in capital raising, mergers & acquisitions. He is the principal of Millers Point Company, an advisory business that provides consulting & advisory services to emerging companies with high growth or turnaround objectives.



ALEX BAKER
Director

Alex has more than 20 years multisector experience, specialising in product innovation in the broader life sciences sector. He has worked in a range of companies including QRxPharma Ltd (ASX:QRX) & Progen Pharmaceuticals Ltd (ASX: PGL). Alex was previously Chief Operating Officer of Leaf Resources & was instrumental in the development & progress of Leaf's Glycell™ process. He holds a Master of Technology Management, Graduate Diploma in Biotechnology & a Bachelor of Science. He is a member of the Australian Institute of Company Directors.



BILL BAUM Director

Well known in the bio-based industry throughout the USA, Asia & Europe having executed US\$500m of biotech & renewable product deals. Bill brings extensive chemical & energy industry experience from across the globe, to Leaf having worked as an independent consultant in biobased chemicals & fuels with companies such as Triton Nutrition, Sirrus Chemicals, Sapphire Energy, Liquid Light, Yulex & SBI Bio-Energy. He has also worked in executive roles with Genomatica, Gevo & Verenium.



#### APPENDIX 7: CORPORATE SNAPSHOT (ASX: LER)

ASX: LER	11 OCTOBER 2018
Ordinary shares on issue	298m
Options/ performance rights	51m
Current Price	\$0.065
Market capitalisation (fully diluted)	\$19m
Top 20 Shareholders	50.3%
Board & Management	8.9%
Cash	\$2.1m <sup>1</sup>
Enterprise Value	\$16.1m

<sup>&</sup>lt;sup>1</sup>At 30 September 2018

