



Enagra Technology Corp. Overview

Presented by Dr. Ralph Overend

March 2013



Oil Palm Plantation: Runaway Success

- Explosion in the industry over past 30 yrs
- Palm Oil dominant edible oil globally

Industry Facts

- 12 Million + hectares planted
- > 40 million tonnes of Palm Oil p/yr
- > US\$30 billion industry resulting



The Problem with Success: Residue Streams



- > 120 million tonnes of residues without useful application
- Disposal is a huge challenge
- Resulting in Biomass burned in boilers or in open fires
- Creates “The HAZE”
- A large environmental problem increasingly attracting Govt and NGO attention



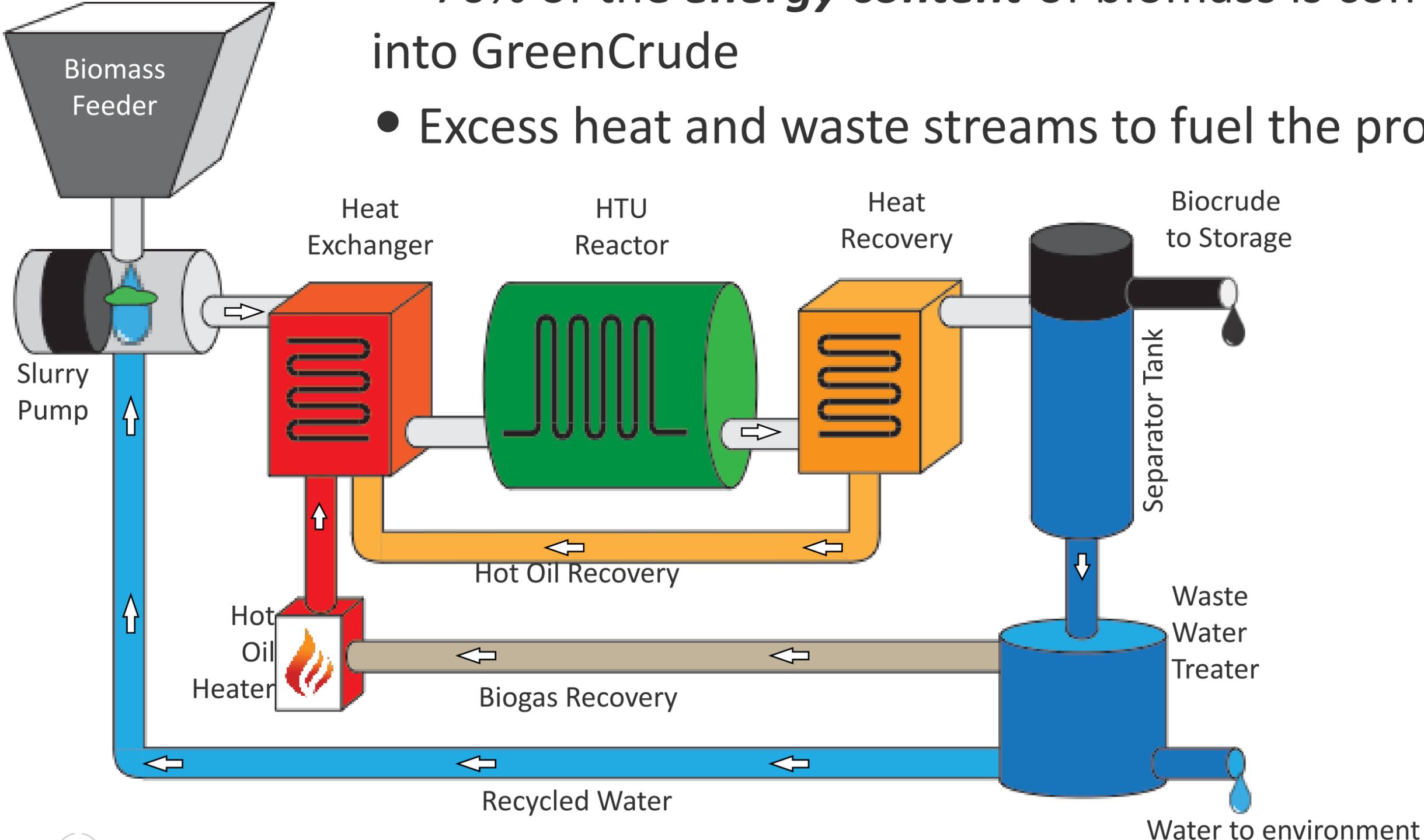
The Solution: Convert Biomass into GreenCrude

- HydroThermal Upgrading, HTU[®] has been demonstrated in ~1000 hours of total operation.
- Thermochemical process
- Water below supercritical threshold ($T \approx 330\text{ C}$, $P\ 220\text{ atm}$)
- Replicates the Earth's process of using temperature, pressure and water to convert biomass into a crude oil like product

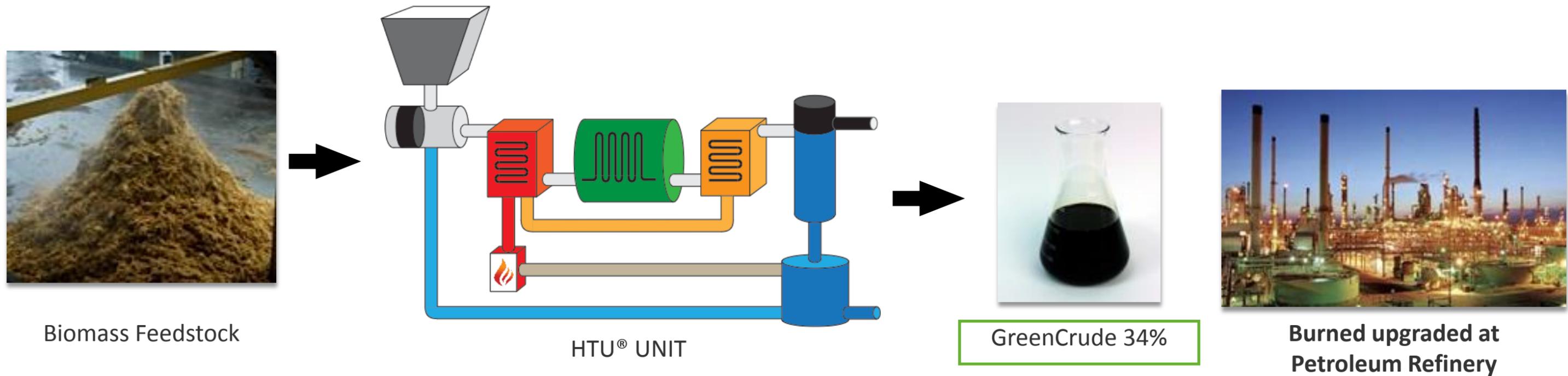


Efficient Process

- ~70% of the *energy content* of biomass is converted into GreenCrude
- Excess heat and waste streams to fuel the process



Process Diagram



- Products GreenCrude, GreenCoal and Water
- GreenCoal can be used in a power plant or used as fertilizer
- GreenCrude can be upgraded in existing oil refining infrastructure
- CAPEX ~ \$400 Bbl/yr
- OPEX < \$30 Bbl

GreenCrude 34%

**Burned upgraded at
Petroleum Refinery**

GreenCoal 10%

**Burned in Power Plant
Or applied as fertilizer**

Technology Background

(19)   (11) **EP 1 315 784 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent: **26.10.2011 Bulletin 2011/43**

(21) Application number: **01975012.4**

(22) Date of filing: **03.09.2001**

(51) Int Cl.: **C10G 1/00 (2006.01)**

(86) International application number: **PCT/NL2001/000648**

(87) International publication number: **WO 2002/020699 (14.03.2002 Gazette 2002/11)**

(54) **PROCESS FOR THE PRODUCTION OF LIQUID FUELS FROM BIOMASS**
VERFAHREN ZUR HERSTELLUNG VON FLÜSSIGEN BRENNSTOFFEN AUS BIOMASSE
PROCEDE DE PRODUCTION DE CARBURANTS LIQUIDES A PARTIR DE LA BIOMASSE

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LJ LU MC NL PT SE TR

(30) Priority: **04.09.2000 EP 00203061**

(43) Date of publication of application: **04.06.2003 Bulletin 2003/23**

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(56) References cited:
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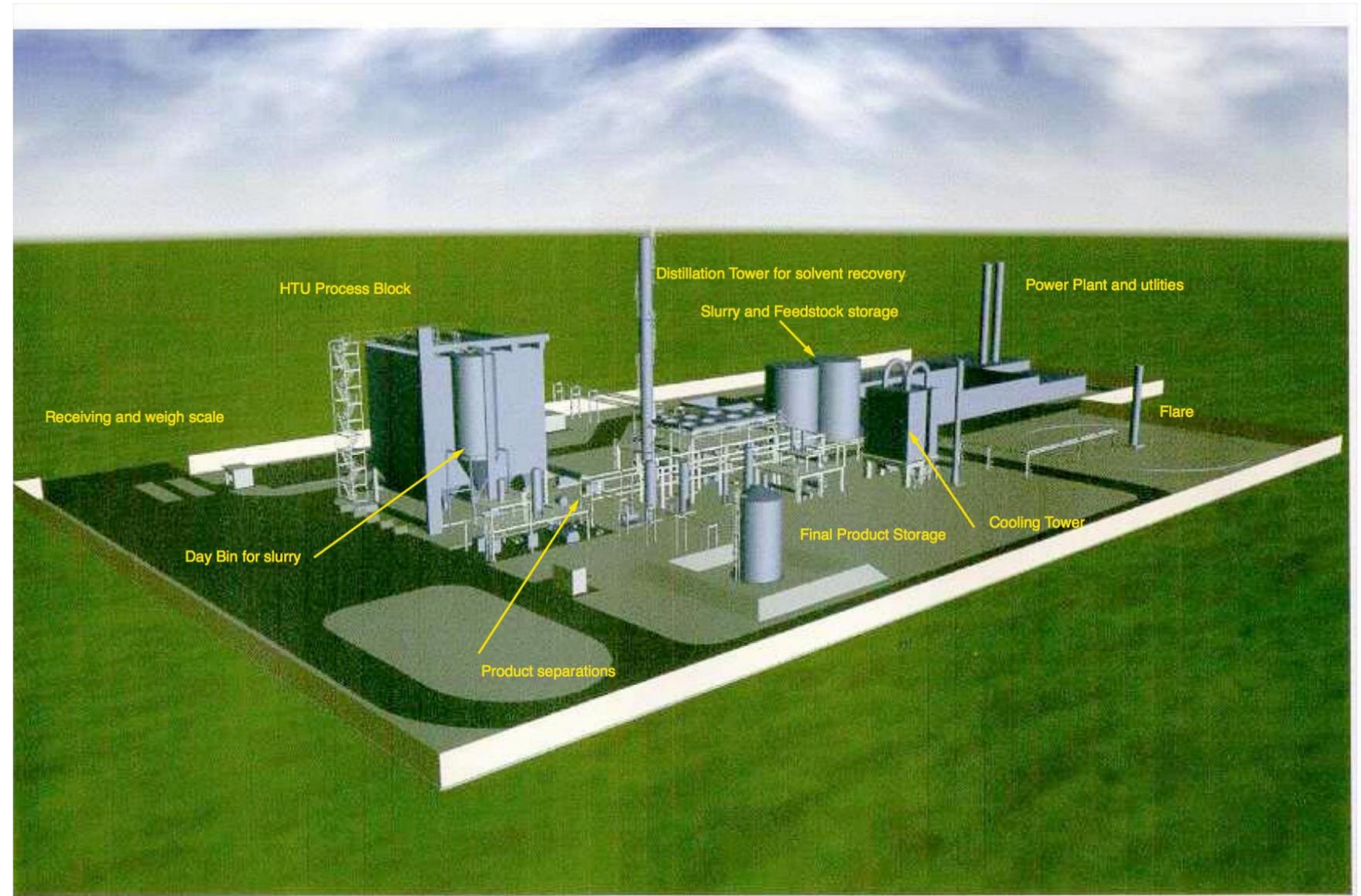
Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

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- Over 30 years of development, starting originally in Shell Labs
- Evaluated by an objective 3rd party and leader in the space
- HTU[®] Intellectual Property includes know-how and existing patents.

First Commercial Partner

- Have executed LOI with first buyer to deploy technology in SE Asia
- A large volume of biomass at a number of locations
- Has large balance sheet
- Owns a fabrication company
- Imperatives to rapidly improve their environmental profile



Enagra Tech Revenue Streams



HTU[®] Plant Sales

- We license the technology to our partner
- EnagraTech receives a fee for each unit deployed



*GreenCrude &
GreenCoal Sales*

- EnagraTec has LOI for Off take with existing major Oil Trading Company
- Aggregates volumes to create additional economics of scale
- EnagraTech receives fee for each Bbl marketed

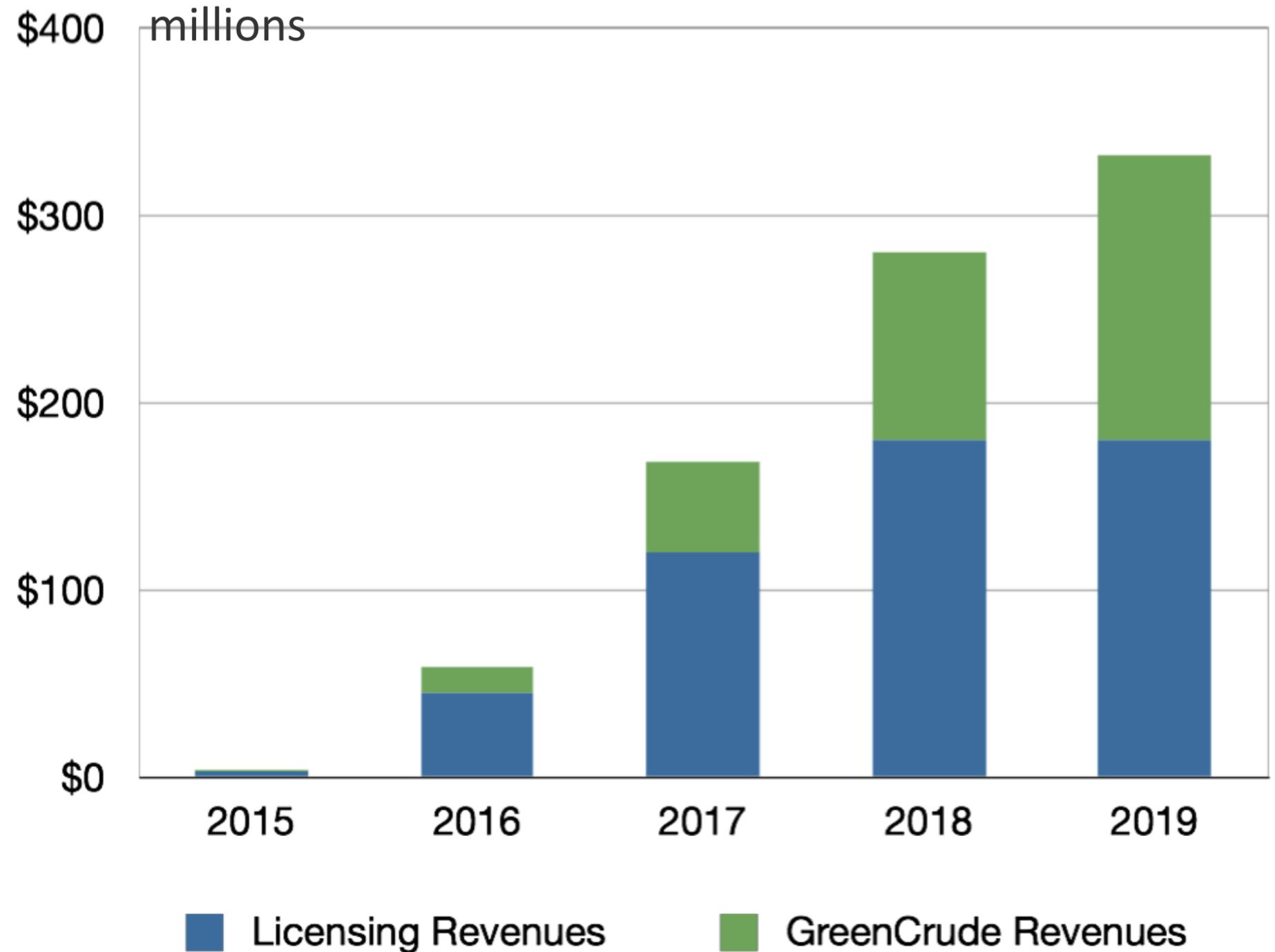
Path Forward

ASK

\$10 Million

DELIVERABLES

- First Unit Deployed
- Sales Pipeline of Signed Customers
- IP Protection



Future Growth

Globally, there is enough biomass to likely support 20,000 HTU[®] refineries at 1,000 bbl/day.



USA

According to DOE & USDA, over 1,366M tons of sustainable biomass available from Ag and forestry residues.



Latin America

- 400+ ethanol plants produce at least 10M tonnes biomass residues.
- 100+ CPO Mills located in region
- Large paper and pulp industry in Brazil



SE Asia

Over 120 M tonnes of palm plantation residues produced annually in Indonesia and Malaysia at 1500+ CPO Mills.



All biomass amounts are annual

Founding Team

Michael Petras, *CEO*

- 10 years as a principal or senior exec at several energy companies
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Ralph Overend *Chief Scientist*

- 30+ years as a research scientist most recently with the NREL
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Dr. Frans Goudriaan *Scientist*

- 25+ years as a research scientist with Shell Labs in the Netherlands
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Jaap Naber *Scientist*

- 20+ years as a research scientist with Shell Labs in the Netherlands
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Milton Leong *VP HTU Sales*

- 10+ yrs financing palm plantations & mills as Director Bank Utama
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Kevin Gorman *VP Biofuels*

- VP Sales & Logistics for National Biofuels, 20+ years managing logistics
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Frank Hughes *VP MarCom*

- 20+ years experience in media and messaging
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KEY OPEN POSITIONS

- VP of Engineering - responsible for delivering Detailed Engineering Design and interface with customers in SE Asia for FCP.
- CFO/Controller



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