

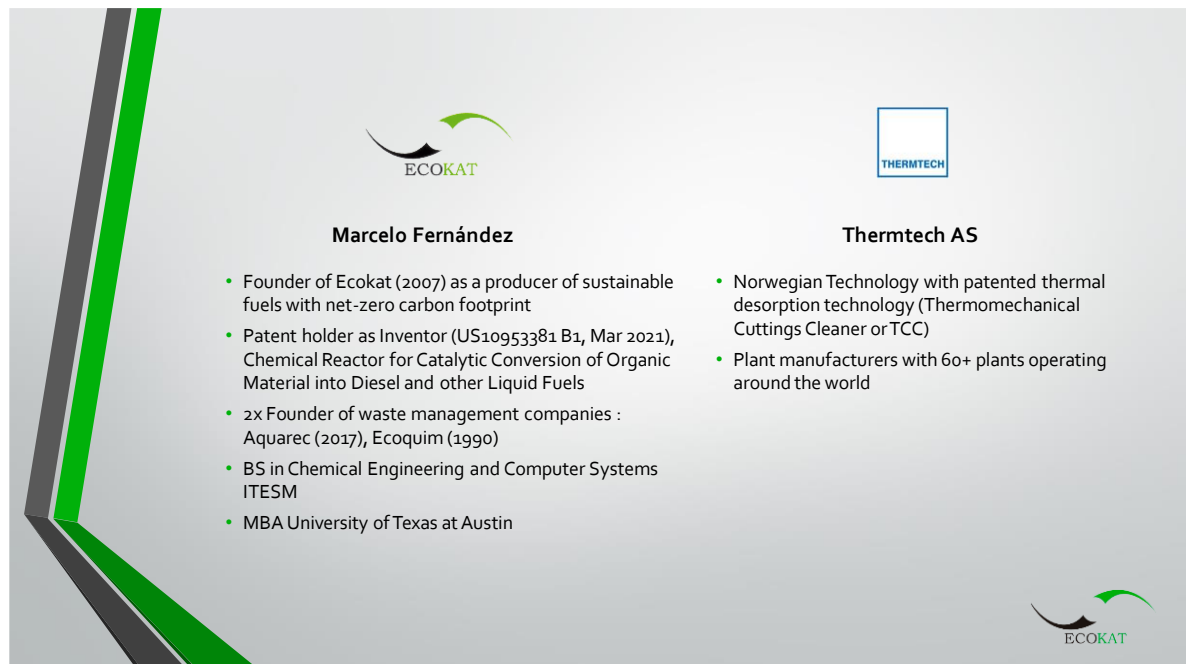
## PITCH FOR SUGAR CANE BAGASSE

### About Thermal Mechanical Catalytic Cracking (TMCC)

**ECOKAT** is pioneering **TMCC** technology as a new solution for decarbonizing transport systems by the production of drop-in carbon neutral second-generation biofuels, in the form of Diesel or Marine Gas Oil. Our revolutionary low temperature technology and pressure-less chemical catalytic oiling of organic waste materials, has the potential to be one of the largest scale and lowest cost approaches for assisting the decarbonization efforts of transport systems, and for achieving a net-zero CO2 mobility.

### 1. About the founder and the team

#### WHO



**ECOKAT**

**Marcelo Fernández**

- Founder of Ecokat (2007) as a producer of sustainable fuels with net-zero carbon footprint
- Patent holder as Inventor (US10953381 B1, Mar 2021), Chemical Reactor for Catalytic Conversion of Organic Material into Diesel and other Liquid Fuels
- 2x Founder of waste management companies : Aquarec (2017), Ecoquim (1990)
- BS in Chemical Engineering and Computer Systems ITESM
- MBA University of Texas at Austin

**THERMTECH**

**Thermtech AS**

- Norwegian Technology with patented thermal desorption technology (Thermomechanical Cuttings Cleaner or TCC)
- Plant manufacturers with 60+ plants operating around the world

**ECOKAT**

- a) Technology alliance with **Thermtech AS**, leader in production of hot swirling fluidized bed plants, with 60+ plants operating around the world.
- b) Responsible for the initial development, startup, consolidation, and accelerated growth to operate and scale the business.

#### WHY THE PITCH

- a) Growing concerns on climate change, the search for renewable sources of energy has intensified.

- b) Biofuels are playing a significant role in the shift towards a more sustainable energy future derived from renewable sources like biomass and waste materials, offering a potential alternative to fossil fuels.
- c) Ensuring truly sustainable production methods needs to be addressed by the market to maximize the benefits of biofuels in the energy revolution.
- d) Pioneering a new solution for decarbonizing transport systems by the production of drop-in carbon neutral second-generation biofuels, in the form of diesel and marine gas oil.
- e) Helping transport companies comply with the renewable energy regulations (Marpol) and regulatory obligations (Mandates) and reduce emissions without sacrificing performance.

## **2. The problem**

### **WHAT IS THE PROBLEM**

- a) Transportation sectors account for more than 15% of total global emissions today.
- b) Alternatives to fossil fuels are needed to decarbonize hard-to-abate sectors that cannot be electrified, including aviation, shipping, and heavy-duty road transport.
- c) Sustainable fuels include drop-in fuels and non-drop-in fuels that require engine or infrastructure retrofits.
- d) To bring costs down and increase availability of biofuels, innovation is required.
- e) The planet cannot wait for zero carbon fuels to reach technological maturity. The transportation sectors need low-carbon fuels now.

### **SIZE OF THE PROBLEM**

- a) US Diesel consumption: 600 million liters/day; +76,000 TMCC400 plants required.
- b) US Marine gas oil consumption: 24 million liters/ day; +3,000 TMCC 400 plants required.
- c) Production of US renewable diesel: 31 million liters/day; less than 5% of total consumption of diesel and marine gas oil.

## **3. Solution to the problem**

### **HOW**

- a) The TMCC process is based on a rapid through contact of hot flowing catalytic swirling bed (Fluidized Bed) with the biomass and waste materials, which quickly fragments the solid feedstock into vapors, gases, and ashes.
- b) The vapors are rapidly quenched, or cooled, and recovered as a renewable diesel.
- c) The by-product gas is used as a fuel for complementary applications such as biomass and waste materials drying.

- d) The ashes and spent catalyst (inorganic material contained in the feedstock) are retired from the plant and disposed as a non-hazardous material free of organic material.

#### ADVANTAGES

- a) The TMCC process is similar to Fluid Catalytic Cracking, or FCC, a common and mature process used by most refineries to convert petroleum feedstocks to gasoline, diesel, and other products.
- b) Using a revolutionary principle of pressure less, low temperature, highly efficient chemical catalytic oiling process and an unconventional friction reactor, producing drop-in carbon neutral diesel and marine gas oil.
- c) These factors, coupled with very short processing time, translate to attractive capital and operating costs.
- d) Over 30 years of process development has led to processing equipment that is simple, robust, and reliable.
- e) TMCC technology is supported by a portfolio of patents on a variety of significant aspects of the process.

#### FEEDSTOCKS

TMCC plants efficiently convert a wide range of pure feedstocks and multiple mixes to valuable renewable diesel.

- a) Biomass and energy crops.
- b) Mill and forest residues.
- c) Agricultural residues from palm oil, sugar cane, corn, agave, rice, sorghum sunflower, wheat, etc.
- d) Selected municipal solid waste refuse derived fuel (RDF).
- e) Plastics mix and rubbers.
- f) Crude oil, refining residue oils, bitumen, waste lubricants.

### **4. Monetize the solution**

#### PRODUCT MARKET FIT

Ussing a range of low-cost feedstocks producing carbon neutral diesel and marine gas oil,

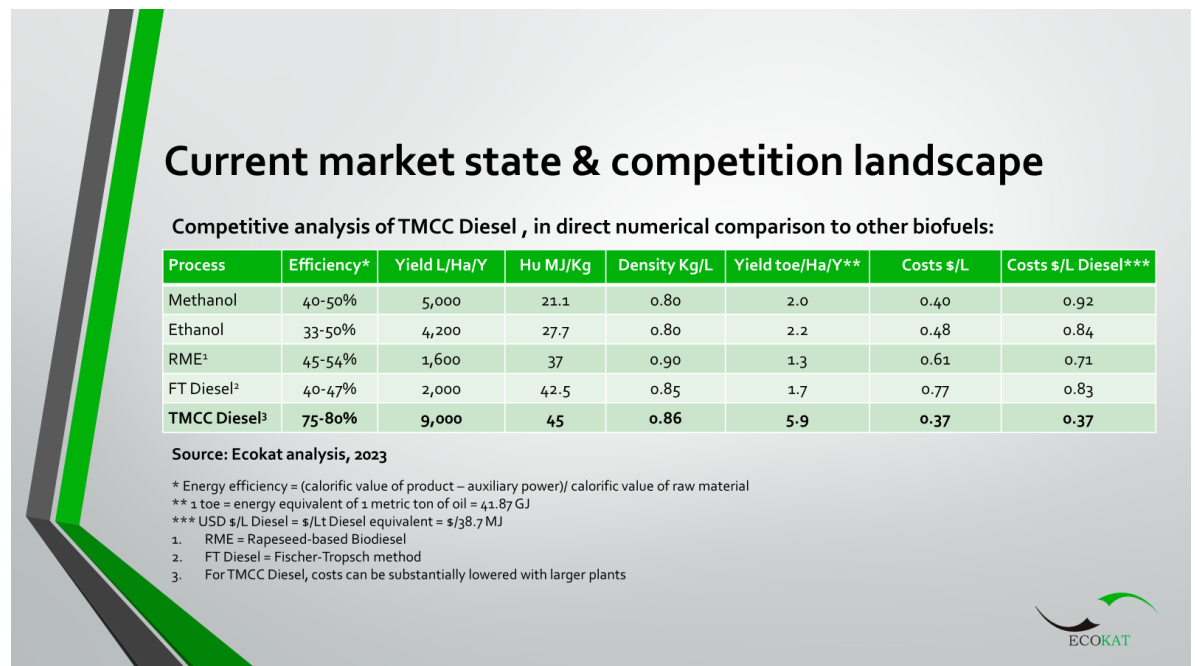
- a) Pure drop-In fuel that can be blended in any proportion with fossil fuel.
- b) High cetane and low density enhances diesel performance characteristics.
- c) Requires no changes to fuel infrastructure or vehicle technology.
- d) Up to 80% lower greenhouse gas emissions.
- e) Excellent performance at both cold and warm temperatures.
- f) Stable, not oxygenated biofuel.

## PRODUCT MONETIZATION

Scaling fuel production and supply needs to overcome bottlenecks in the construction of production facilities and the supply of feedstocks.

- Developed modular production technology.
- Plants are smaller, more flexible, mobile, and easier to build.
- Unlock a new, decentralized model for sustainable drop-in fuels based on widely available local feedstock, which is replicable and scalable anywhere in the world.
- Reduction of the length of the overall fuel supply chain by being close to feedstock suppliers & off takers, reducing environmental impact and contributing to a circular economy.

## COMPETITION



- TMCC technology offers the highest energy efficiency compared to other first and second-generation biofuels technologies.
- We offer the lowest equivalent production costs to other technologies.

## 5. How much raising

### INVESTMENT

The proposed initial investment is set at \$3,500,000 USD.

- \$3.0 Million USD in one turnkey TMCC400 (400Kw) plant, plus

- b) \$500,000 USD for auxiliary equipment, infrastructure, and working capital during the construction period and to finance the proposed operation.

Our business model allows for any number of plants to be operated, since each site works as an independent profit center. It is a modular model that can be escalated to any size up to **1400 Kw** plants.

The TMCC400 plant can process a yearly amount of 17,200 tons of dry Sugar Cane Bagasse (SCB), at a feeding rate of (2 tons/hr), producing in total 7´031,000 liters of diesel, with a production plant capacity of (818 liters/hr) of diesel, and 8,600 working plant hours/year.

#### LARGE SCALE OPERATION

Large-scale commercial operation includes future plant sales/operation for Sugar Cane Bagasse (SCB) for a Total of 27 TMCC 400 kW plants.

A future business opportunity for ECOKAT includes the sale/operation of TMCC plants to the client processing and servicing Sugar Cane Bagasse with the original turnkey TMCC 400kW plant once the proof of concept is achieved in year 1 of operation.

- |                        |           |                   |
|------------------------|-----------|-------------------|
| • 3 TMCC 400 kW plants | in year 2 | to the SCB client |
| • 3 TMCC 400 kW plants | in year 3 | to the SCB client |
| • 3 TMCC 400 kW plants | in year 4 | to the SCB client |

From year 5 to 10 of the Project, we expect similar sales/operation of plants to other clients and applications.

#### OFFER

We offer our client **100% full ownership** of the **TMCC400kW** plant for an investment of 3.5 million USD, with a **Project IRR of 55%**, and the participation of future ECOKAT projects with high internal rate of returns of 25%+ in the most conservative scenarios.

The opportunity a TMCC plant brings is \$2M USD average annual cash flow per year, in a 10-year period span.