SixRing™

A Chemical Evolution™ Company

Pathways to Commercialization:

Biogas and Bio-oil

ScalingUp Bioeconomy Conference 2024

Scott Treadwell

SixRing Advantages

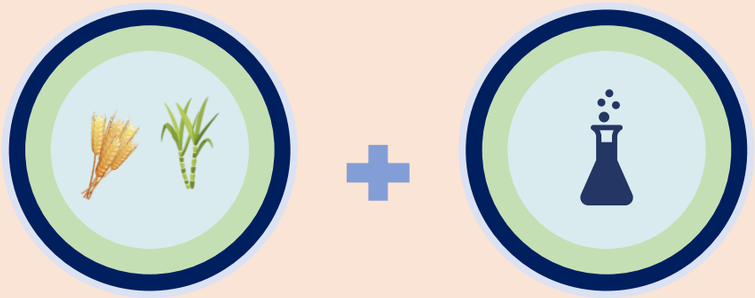
Low-Cost, Highly Efficient Conversion Of Biomass To High-Value Products – Cellulose And Highly Functional Biocrude

- **Feedstock Flexibility**
- **Product Optionality replaces subsidies**
- **Low Process Complexity**
- **Carbon Advantage**
- **Simple Equipment**
- **12+ Years of Experience And R&D**

Existing Biomass Conversion Technologies Suffer From Significant Challenges

Global demand for green chemicals and biofuels is rapidly increasing, however existing processes which utilize food-based biomass are unsustainable and involve processes which take place at high temperatures & pressures, destroying valuable biomass constituents

Existing Technologies



Food-Based Biomass

Treatment Required

- ✖ Food vs Fuel
- ✖ Commodity products and low optionality
- ✖ Subsidy dependence

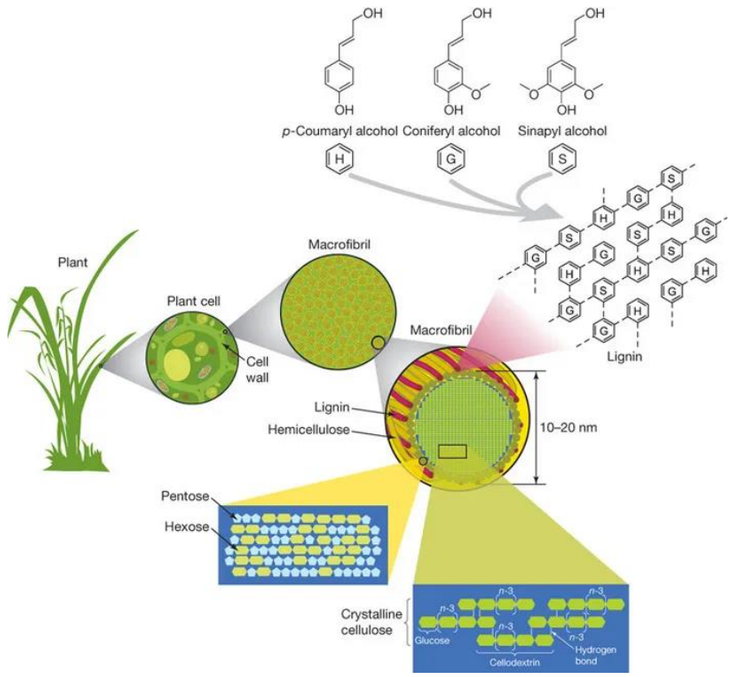
Non-food Biomass

Technical Challenges

- ⬆ Temperatures
- ⬆ Pressures
- ⬆ Carbon Intensity
- ⬆ Feedstock limited

- Products Impacted After Valuable Constituents Destroyed
- Hard To Process Products
- Multiple Technology Providers Increasing Risk
- High Waste Ratios

SixRing's Process Carefully Separates Lignocellulosic Biomass Into Four Constituents



Lignocellulosic Biomass

Separation into constituents at
Ambient Pressure
and
Ambient Temperature

1. **Cellulose** — Linear, high molecular weight, semi-crystalline polysaccharide
2. **Lignin** — Complex, three dimensionally crosslinked organic biopolymer
3. **Hemicellulose** — Branched, low molecular weight, amorphous polysaccharide
4. **Inorganics** — Varying properties

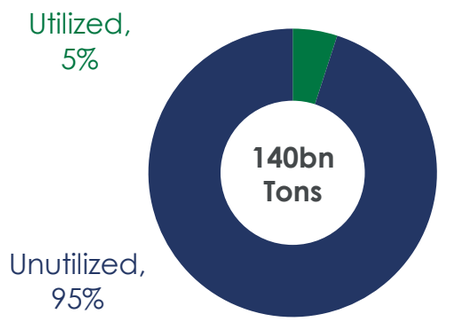
Feedstock Agnostic – Inputs Are Abundant, Low-cost And Scalable, Eliminating Supply Chain Constraints

- Entirely feedstock agnostic – SixRing's technology allows for widely available, cheapest and almost **limitless types of lignocellulosic biomass**
- **Feedstocks do not compete with food production**
- **Supply > demand** for waste from forestry / agriculture sectors vs other feedstocks; **extremely attractive unit economics**
- **Infrastructure** to gather / transport the feedstock **already exists**
- Can be deployed **in any global region** with forestry / agriculture resources and suitable infrastructure
- Targeting countries with **high production of feedstock**
- **Significant addressable market** for licensing

Tested Feedstocks[1]

Agricultural	Forestry & Exotics
	
Straw – Rice / Canola / Wheat / Hemp	Hard/softwood (woodchips, sawdust)
Corn Stover	Date palm tree residue
Bagasse	Kraft lignin

Available Lignocellulosic Biomass:



Majority is burnt, left to decompose or sent to landfill

1) Not an exhaustive list

SixRing's Technology Overcomes These Challenges, Converting Any Lignocellulosic Biomass Into High-Value Products

Sustainable Lignocellulosic Biomass

Abundant and Low-Cost Feedstock with no Pretreatment

Uses underutilized industrial plant-based waste biomass, as opposed to food crops

Low Carbon Intensity

Core Process has a CI score of 9-25gCO2 e/MJ

SixRing Delignification Process

Occurs at ambient pressures and temperatures ***= low carbon intensity, limited damage to cell contents and very high yields***

Process Efficiency

Processing and method innovations result in some of the world's highest recoveries / yields of value-add products

Recycles / Reuses Chemicals

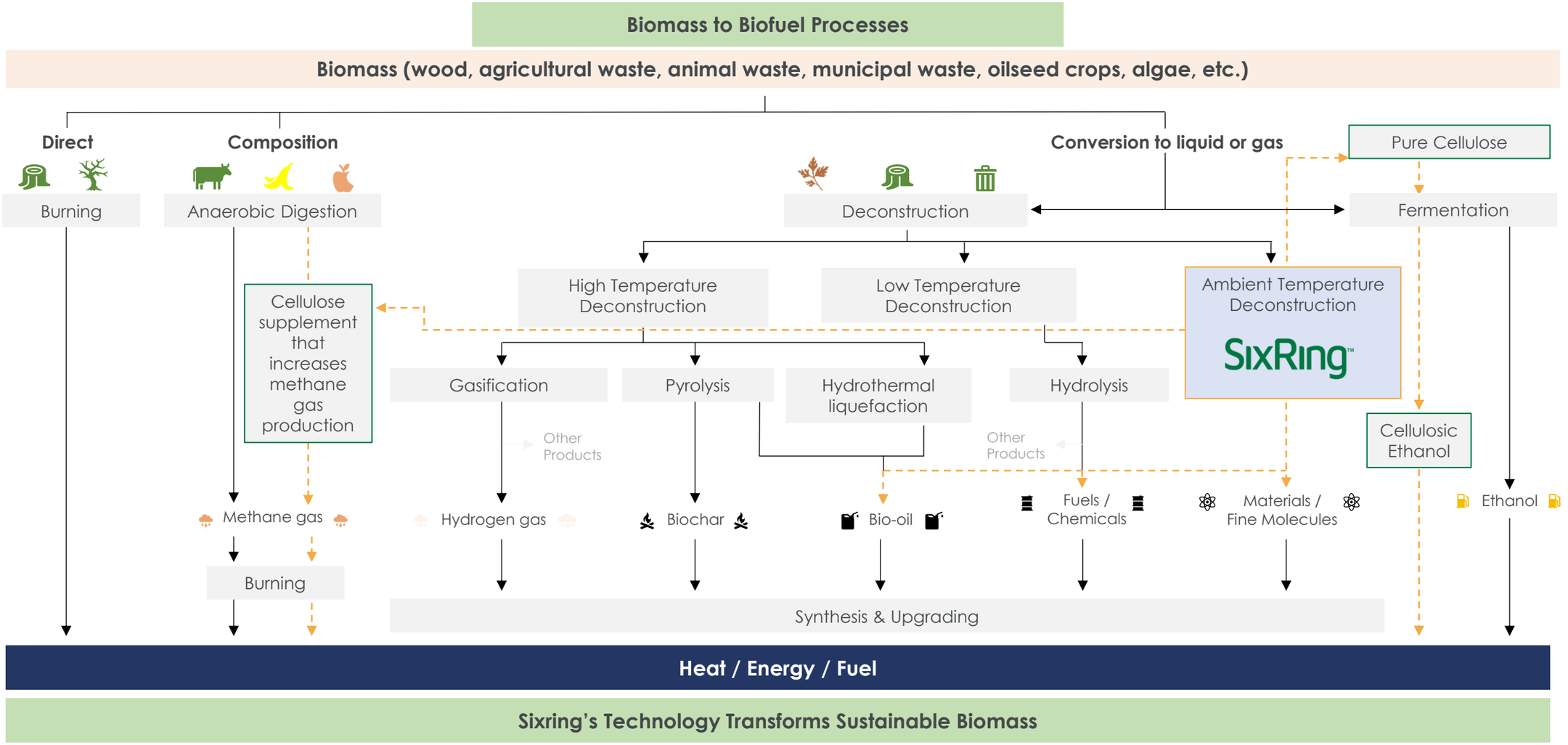
Main chemistry can be recycled, resulting in minimal waste products and higher yields

Sustainable Chemicals

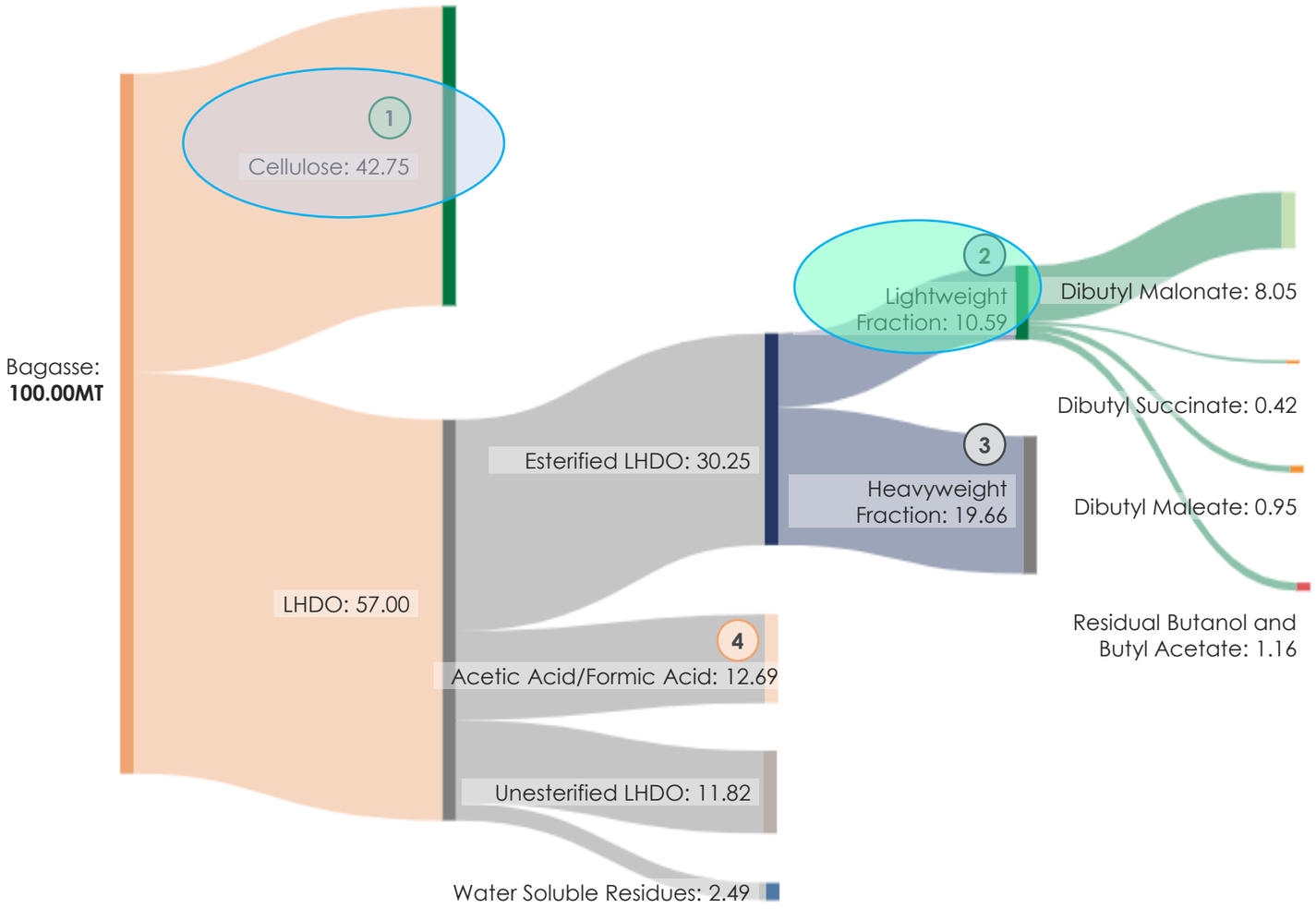
Biofuels

High-Value Materials

SixRing's Technology Sits Within The Scientifically-advanced Optimal Zone Of The Biomass-to-Biofuel Production Process



High End-market Product Conversion With Attractive Product Optionality



Products	Primary Market	Other Markets
1 Cellulose	RNG (Anaerobic Digestion Additive)	Ethanol Building Materials Food & Pharma
2 Lightweight Fraction	Refineries (Diesel Additive)	Sustainable Fine Chemicals
3 Heavyweight Fraction	Industrial Chemicals	Conversion To Lightweight Fraction
4 Acetic Acid	Various: Plastics & Polymers, Dyes & Inks, Food & Beverage, Textiles	

Commercial Developments – RNG

Key Features For SixRing's Cellulose For AD

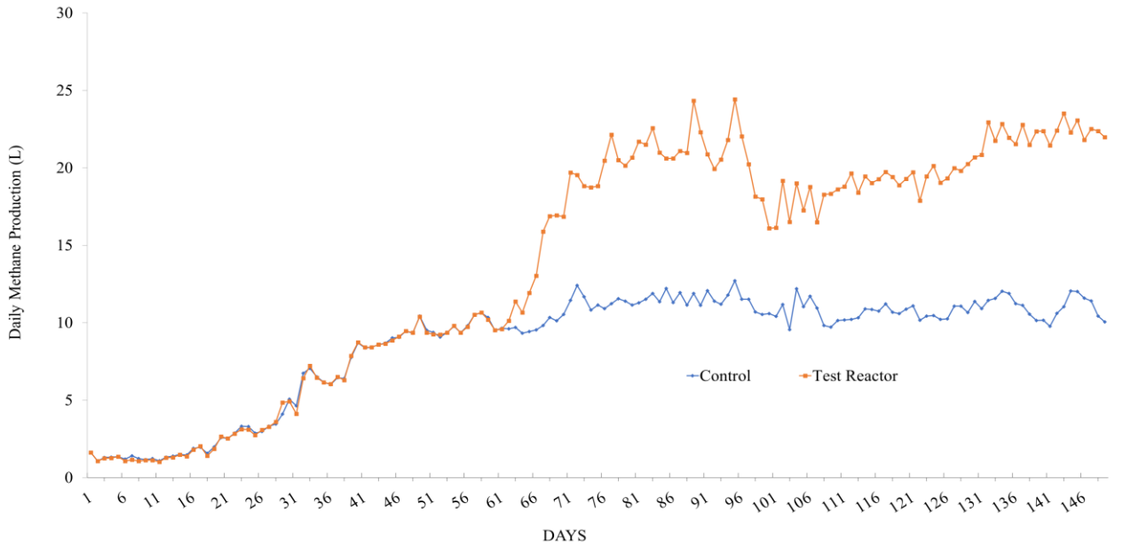
Increased surface area	Faster degradation into high-value products
<0.5% wt. lignin content	Higher biodegradability – lignin biodegradation is slower and can be toxic
Added functionality from surface chemistry	Potential buffering and hazardous gas sequestration capabilities
High bioavailability	Provides a consistent ready-to-use source of carbon for the microbial community
Minimal amounts lead to big changes	Addition of SixRing's cellulose results in significant increase in methane volumes

Tested in on-farm and laboratory conditions

Science-first approach

Final trial and commercial sales discussions underway

Recent trials show an increase in methane volumes by >80% for Anaerobic Digestion in the production of RNG



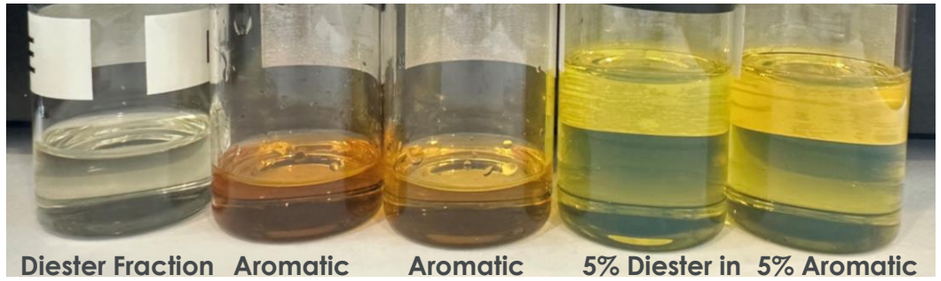
Improved Economics By Using SixRing's Cellulose

- Significantly lower input costs when the cellulose is used as a supplement
- Lower processing costs
- Reduced feedstock volumes / costs

Commercial Developments – Diesel/Marine Fuel Additives

Key Advantages For SixRing's Diesel/Marine Fuel Additives

Drop-In	No Refining/Upgrading of SixRing's LHDO
Green Additive	Low CI-Score Additive (Ethanol Equivalent)
Lubricity Additive	Increases lubricity significantly
Conductivity Additive	Increases conductivity significantly
Emission Reduction	Acts as fuel Oxygenates - Potential of emission improvement (particulates, NOx, SOx)



Diester Fraction Hardwood | **Aromatic Fraction Date Palm** | **Aromatic Fraction Bagasse** | **5% Diester in Diesel** | **5% Aromatic Date Palm in Diesel**

Recent tests show viability as a drop-in green, low CI-score diesel additive with improved fuel properties at low dosing

Test Protocol	Property	Raw Diesel	W Additive	Units
ASTM D93	Flash Point, Proc-A	50.0	54.5	°C
ASTM D2500	Cloud Point	- 25	-26	°C
ASTM D6079	Lubricity, HFRR @ 60°C			
	Wear Scar Diameter	570	400	µm
	Major Axis	- - -	410	µm
	Minor Axis	- - -	400	µm

Testing with AB Summer Diesel Blend

Improved Carbon Intensity and Fuel properties By Using SixRing's Diesel Drop-In Additive

- Potential to lower CI-score of conventional diesel/marine fuels
- Improves certain fuel properties like lubrication, conductivity
- Potential to reduce hydrocarbon and particulate (soot) emissions

Consistent Results Achieved Across Hundreds Of Reactions With Commercial Scale Reactor Already Operational

Commercial scale

- **Technology Readiness Level 8**
- **Commercial scale reactor** (20,000 L) operational **since Nov-23**
- Technology has been **scaled multiple times with improved efficiency and reduced chemical consumption** as the reactor sizes increase
- **Previous scale-up was 4x**, from 5,000L reactor to 20,000L – FoaK plant will utilize multiple 30,000L reactors
- **Utilises >90% off-the-shelf equipment** in conjunction with low complexity SixRing reactors, which **reduces execution scope and risk**
- **100s of reactions** have been undertaken utilizing feedstock supplied from four continents by partners SixRing is negotiating licenses with
- **5+ years since benchtop testing and over $25 million of R&D investment**
- **Technology has been verified** by multiple third-parties including global supermajors, potential licensee partners and soft funding providers
- >50 feedstocks tested with very limited output variability and **no change required to the process**

First Of A Kind Facility, Secured Pending Financing, Will Prove Operations At Scale And Lead To Licensing Model

Overview: LOI with **exclusivity** signed covering the acquisition of a legacy biofuels facility, to be retrofitted with SixRing technology

Purpose: Brownfield facility simultaneously **proving operations at scale** and the ability to retrofit into underperforming biofuels facilities, presenting a significant opportunity for licensee partners, whilst allowing SixRing to **accelerate time to first production**

Minimal scale and execution risk – current commercial design utilises >90% off-the-shelf equipment in conjunction with low complexity SixRing reactors, which have been proven at scale and does not require a full-scale conversion of the facility

Established team transferring from the seller to **support facility operations**

Strategically located facilities with secure & stable access to feedstocks – **4x the required feedstock within 50km of facility** (based on 250 MTD facility)

Better than cost of capital returns with a >40% IRR
(before considering upside of capital and operating subsidies)

Secured non-dilutive funding of >$3m from the Provincial Government and currently being considered for an additional $5-10m

Secured Brownfield Facility

25MT/day facility	Within 250KM of Calgary HQ
Scope to expand to 250MT/day	Total capex: c$55M

Demonstrating commercial operations at scale will allow SixRing to commence with its licencing model whilst controlling engineering, construction and optimization of the technology

Greenfield development also an option but with slightly longer timeline

Thank You!

Email for more info!