December 9th, 2016 Webinar

FARM TO FLY

With VT Dairies

INCREASED QUALITY OF LIFE AND REVENUE – THE PATH FORWARD

GSR Solutions LLC

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A SUSTAINABLE PARTNERSHIP FOR DAIRY FARMS AND WASTE GENERATING BUSINESSES

INCREASED QUALITY OF LIFE AND REVENUE

- ABOUT GSR SOLUTIONS PROCESS OUTCOME
- SCHEMATIC
- GOALS – VERIFY / SCALE UP / IMPLEMENT
- TEAM ENGAGEMENT
- MILESTONES ON THE MULTI-YEAR ROAD
- NEXT STEPS

THE PATH FORWARD
GSR PROCESS OUTCOME
8+ YRS PUBLIC/PRIVATE WORK

Partner added

2015 pilot and commercialization planning
GMP /Franklin County

2016 National Outreach
DMI/Newtrient

2013 supply chain feasibility/benchmarking
USDA/CAAFI/VFDA

2011 Algae conversion to oil and co-product feasibility EPA/NASA

2010 Algae strain Isolation / Bench testing begun DOE/VSJF

2009 Bioprospecting begun local Farms

2008 GSR formalized - Waste/Algae Integrated Proof of Concept (NSF / VT EPSCoR)
For **300 Cow dairy farm**

- Supply Chain Engaged
- 100,000 lbs. granular (phosphorus / nitrogen) fertilizer - reduced nutrient loss to enhance water quality
- Benchmarked Industry Fuel Production over 20,000 gallons sustainable biofuel (Jet, diesel, home heating oil)
- Recycle water for farm usage
- Enhanced Energy Return on Investment
- Improved H-35 Compliance

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*annual estimation based on mass and energy; includes off-farm waste streams

* supported by Supply chain partners, public (USDA, EPA, DOE, NSF, EPSCoR), and private sectors
EXECUTE GSR PROCESS MODEL

INTEGRATION OF ALGAE OIL PRODUCTION FOR WASTE TO VALUE via patent pending
GSR Process Model for Waste to Value - Integrated Algae Oil Production
GOALS – VERIFY / SCALE-UP / COMMERCIALIZE

VERIFY – VALUE OF GRANULAR FERTILIZER AND REDUCE NUTRIENT

SCALE UP - QUANTIFY THE FUEL AND FERTILIZER PRODUCTION VIA NORDIC FARM PILOT

COMMERCIALIZE – FIRST AT GMP’S COMMUNITY DIGESTER, THEN EXPAND VIA LICENSING AND PARTNERSHIP IN STATE AND NATIONWIDE
VT/NATIONAL SUPPLY CHAIN TEAM ENGAGED
NEXT STEPS – VERIFY THEN SCALE UP AND COMMERCIALIZE

• **VERIFY** VALUE OF GRANULAR FERTILIZER
• **SCALE UP** PILOT PROJECT (FARM SCALE)
• **PLAN FIRST** COMMERCIAL APPLICATION WITH GMP / COMMUNITY DIGESTER
• **ENGAGE** NEW PARTNERS AND CUSTOMERS
• **COORDINATE/COMMUNICATE** FUTURE PLANS / PROGRESS
SCALE UP – FARM PILOT

- **RESTORE PARTNER FARM DIGESTER** (UNDER PROGRESS) - *proposals by the farm in place*

- **CONFIRM GRANULAR FERTILIZER IMPACT ON RUNOFF REDUCTION USING GSR TECHNOLOGY** (VIA USDA VAPG FUNDING) – *project started*

- **SECURE PUBLIC/PVT FUNDS FOR PILOT EXECUTION** VIA USDA NRCS (CONSERVATION INNOVATION GRANT – CIG) - *under preparation*
PLAN FIRST COMMERCIAL APPLICATION WITH GMP / COMMUNITY DIGESTER

- SIGNED MOU WITH GMP FIRST QUARTER 2015 complete
- PURSUE INTEGRATION PLAN WITH GMP AND OTHER INDUSTRY PARTNERS (NDAs signed and proposals under preparation)
- ESTABLISH OPTIMAL FUEL REFINERY INTEGRATION (initiated application preparation)
LEVERAGE EXISTING RELATIONSHIPS (CAAFI / NBB / VFDA / VFB) **ongoing**

INITIATE PARTNER DISCUSSIONS DMI-SPINOFF NEWTRIENT/FUEL PROCESSOR (GTI) COOPERATION – **engaged/initiated**

CONTRACT END CUSTOMER CANDIDATES FOR INITIAL OFFTAKE (e.g. Air Canada (Jet), GMP - (Diesel) **initiated**
COORDINATE/COMMUNICATE FUTURE PLANS

COMPLETE PLANNING TO GUIDE PLAN EXECUTION

- ENGAGE PRIVATE / PUBLIC CONTRIBUTORS

- ADD SUPPLY CHAIN PARTICIPANTS, NGOs, AND FOUNDATIONs

- HOLD PUBLIC MEDIA EVENT FEATURING KEY ENGAGED PARTICIPANTS
PUBLIC UPDATE / ADVISORY MEETING

STAY TUNED FOR OUR PUBLIC EVENT IN 2017
For more info about this presentation or biomass to liquid fuel or co-products contact GSR SOLUTIONS

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