



December 9th, 2016 Webinar



FARM TO FLY

With VT Dairies

INCREASED QUALITY OF LIFE AND REVENUE – THE PATH FORWARD



GSR Solutions LLC

A SUSTAINABLE PARTNERSHIP FOR DAIRY FARMS AND WASTE GENERATING BUSINESSES

INCREASED QUALITY OF LIFE AND REVENUE

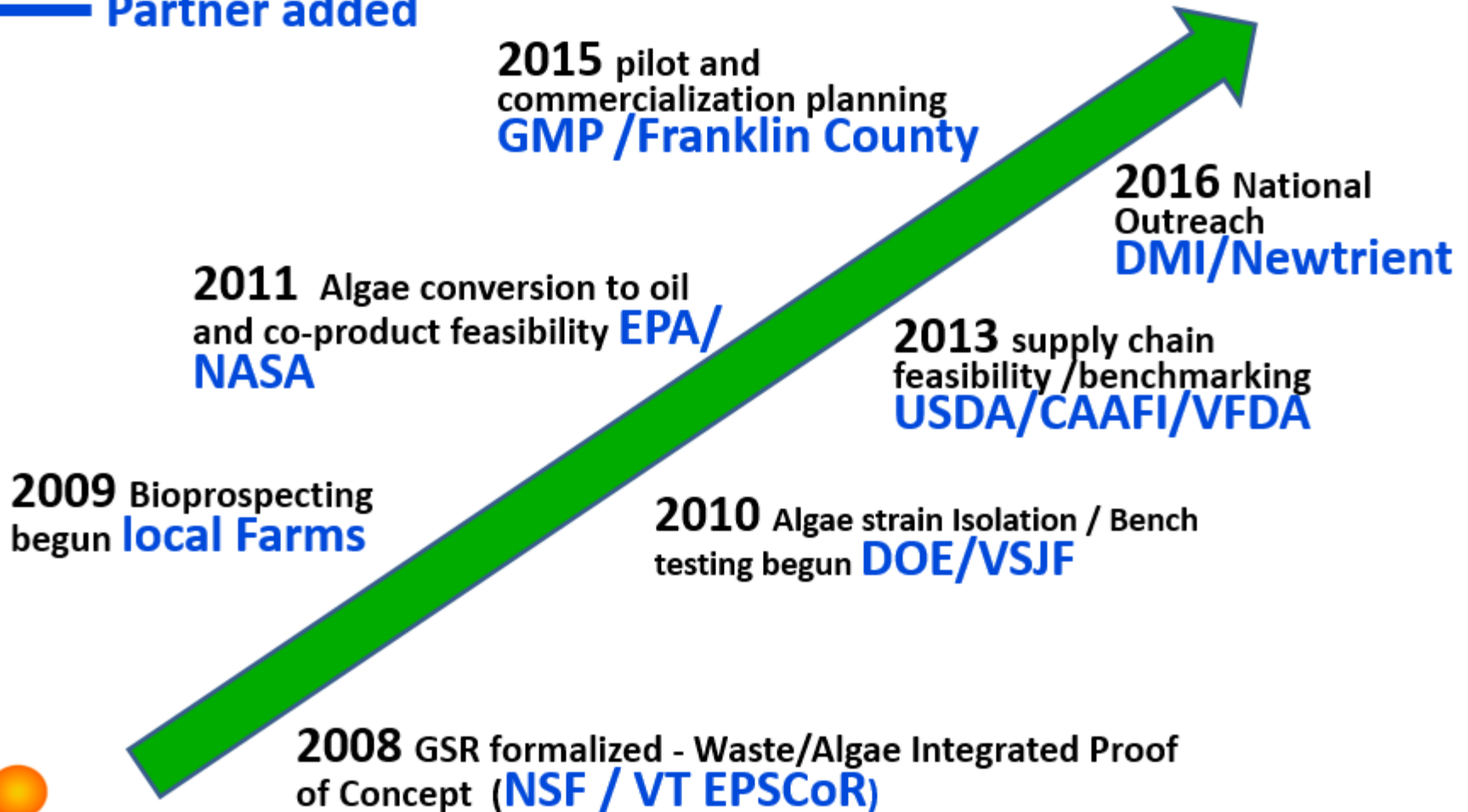
- ABOUT GSR SOLUTIONS PROCESS OUTCOME
- SCHEMATIC
- GOALS – VERIFY / SCALE UP / IMPLEMENT
- TEAM ENGAGEMENT
- MILESTONES ON THE MULTI-YEAR ROAD
- NEXT STEPS

THE PATH FORWARD

GSR PROCESS OUTCOME

8+ YRS PUBLIC/PRIVATE WORK

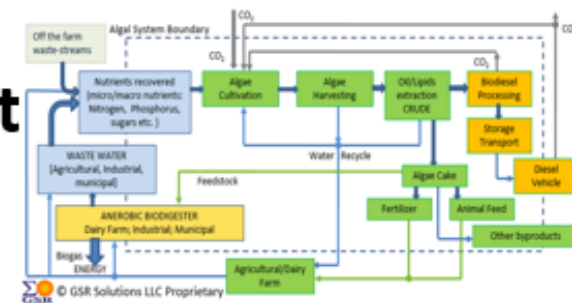
— Partner added



OPPORTUNITY IDENTIFIED VIA USDA SUPPORT – A CULMINATION OF OVER 8 YEARS OF R&D*

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**



[§] annual estimation based on mass and energy; includes off-farm waste streams

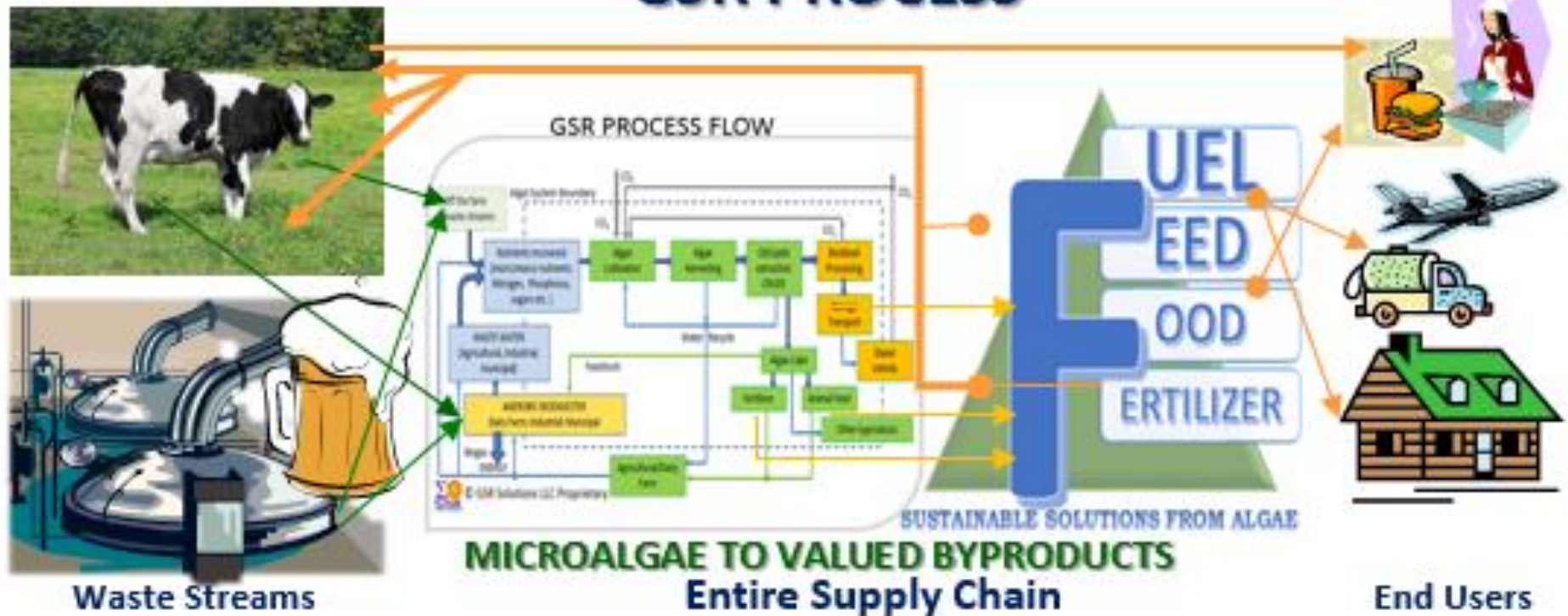
* supported by Supply chain partners, public (USDA, EPA, DOE, NSF, EPSCoR), and private sectors

EXECUTE GSR PROCESS MODEL

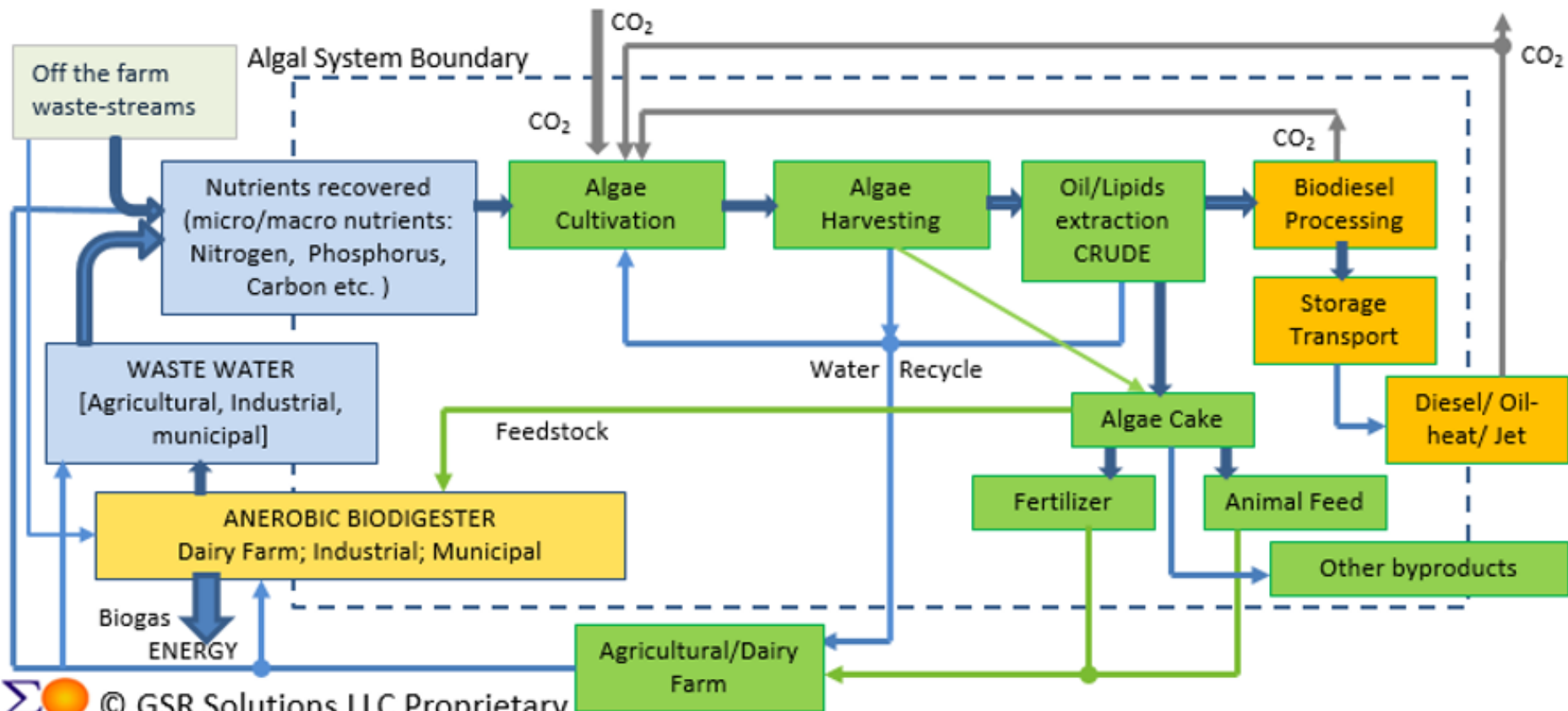
INTEGRATION OF ALGAE OIL PRODUCTION FOR WASTE TO VALUE

via patent pending

GSR PROCESS



GSR Process Model for Waste to Value - Integrated Algae Oil Production



GSR in the Nutrients Recycling Challenge

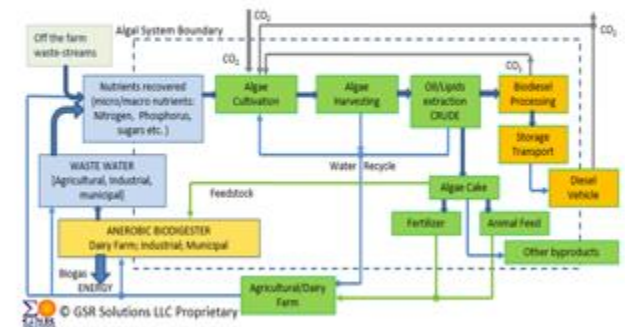


GOALS – VERIFY / SCALE-UP / COMMERCIALIZE

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



United States Department of Agriculture
Rural Development



U.S. DEPARTMENT OF
ENERGY



Vermont Sustainable Jobs Fund



National Science Foundation
WHERE DISCOVERIES BEGIN



NASA EPSCoR



National Aeronautics and Space Administration (NASA)



The
UNIVERSITY
of VERMONT



VFDA
Vermont Fuel Dealers Association

John Todd Ecological Design
www.toddecological.com



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 (*NDA's signed and proposals under preparation*)
- ESTABLISH OPTIMAL FUEL REFINERY INTEGRATION (*initiated application preparation*)



REACH OUT TO ADDED POTENTIAL PARTNERS AND CUSTOMERS

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
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