AG ENERGY

November, 2017
FOUNDED IN 2010
VISION: DEVELOP AND SELL SYSTEMS TO CONVERT AGRICULTURE WASTE INTO REVENUE

Harvesting Residues Yields Returns.
PROPRIETARY PRODUCTION TECHNOLOGY

INTEGRATED BIOMASS PLATFORM

• Fully automated gasification system
• Feedstock Flexibility
• Superior product consistency
• Modular design / incremental production capacity increase
• Installed near feedstock locations or distribution points

• Strong Intellectual property strategy on equipment and material composition
COMMERCIALIZATION STRATEGY

Initial Strategy

- Syngas to Power
  - $43/day @ 4.5 cents/KW (WA)
  - $144/day @15 cents/KW (CA)
  - $92/day @ 90 cents/therm NG

Biochar

- $350/day @ $1000/ton

No Biochar Commodity Market
- All Biochar is different

*Harvesting Residues Yields Returns.*
AGRICULTURAL APPLICATIONS

Heinz 2653 (Field Variety)

Oregon Spring (Garden Variety)

Harvesting Residues Yields Returns.

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FY2016 FOREST SERVICE GRANT

• Focused on feasibility and economic viability of converting slash to biochar
  – Chipper selection and gasification system demonstration
  – On-site vs centralized location
    • Operational scenarios and associated equipment
    • Labor requirements
    • Developed economic evaluation for different operational scenarios

• Conclusion:
  – More economically viable to chip on site and haul to centralize location
  – Slash biochar contains more nutrients than whole log biochar
  – There is no commodity market for biochar
  – Niche markets are being developed by Biochar companies
FY2017 FOREST SERVICE GRANT

• Focused on creating a market for forest residue biochar
  – Wood based biochar have excellent filtration characteristics
  – Evaluate the effectiveness of removing nutrient (P&N) from lake water – lab scale
    • Evaluate the effectiveness of nutrient saturate biochar on plants
  – If viable, scale lab results to lake solution
    • Develop system concept, evaluate lake impact, economic viability
  – Investigating other filtration markets
CONCLUSION

• Multiple efforts focused on converting excess biomass to Biochar
• There is no real commodity market for Biochar
• Biochar companies are developing their own niche markets
  – Largest adaption for biochar is soil amendment
  – Water filtration and mine reclamation is emerging

• There needs to be a focus on market development
• As these markets evolve, excess forest residue will be a valuable feedstock