

BIOGASDONERIGHT™

REPORT AND RESULTS OF THE FIRST INTERNATIONAL STUDY:

INTRODUCTION AND RATIONALE

PRESENTED BY:

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ROME, ITALY

Dr. Kurt Thelen Apologizes for Not Being Here: *He is Still Looking for His Car*

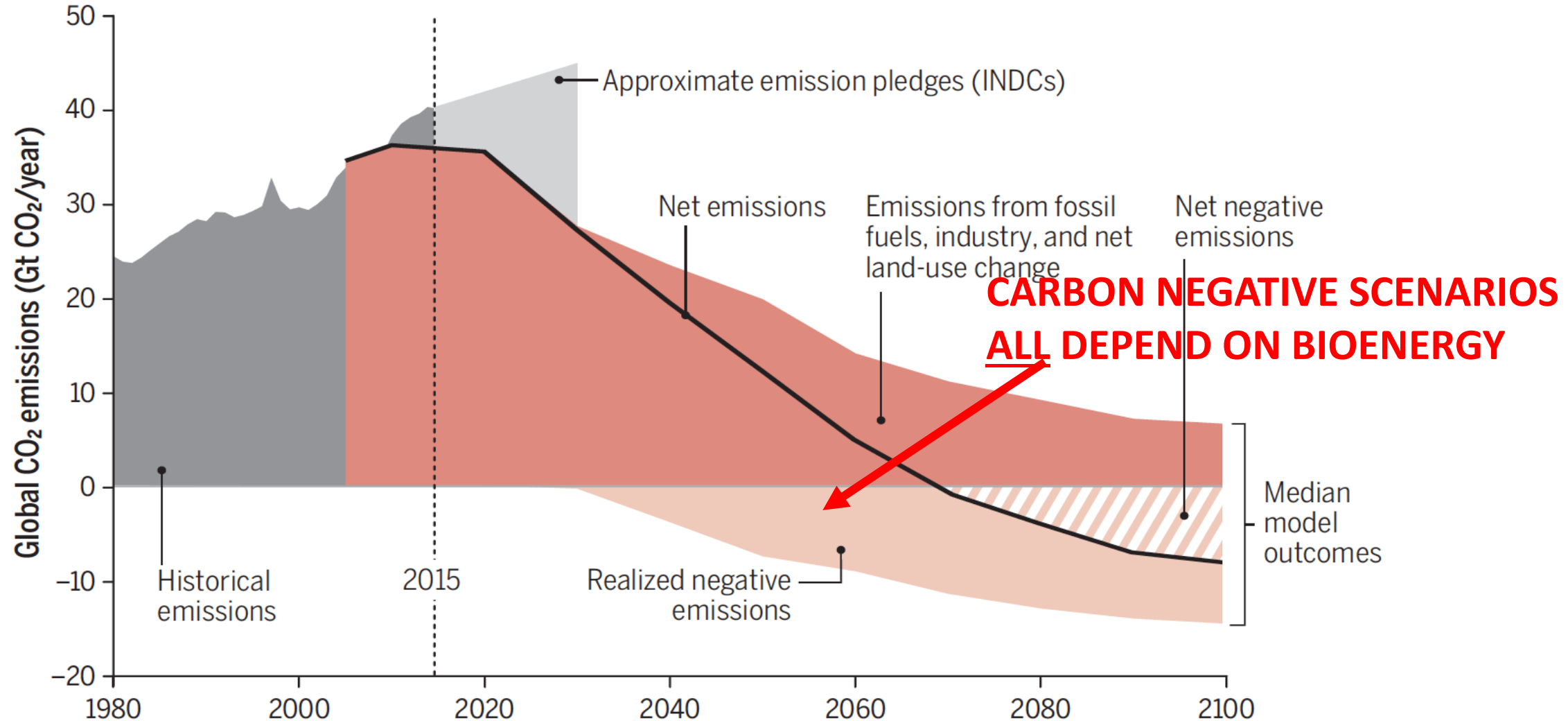


BACKGROUND: WHAT ARE THE CURRENT TRENDS &

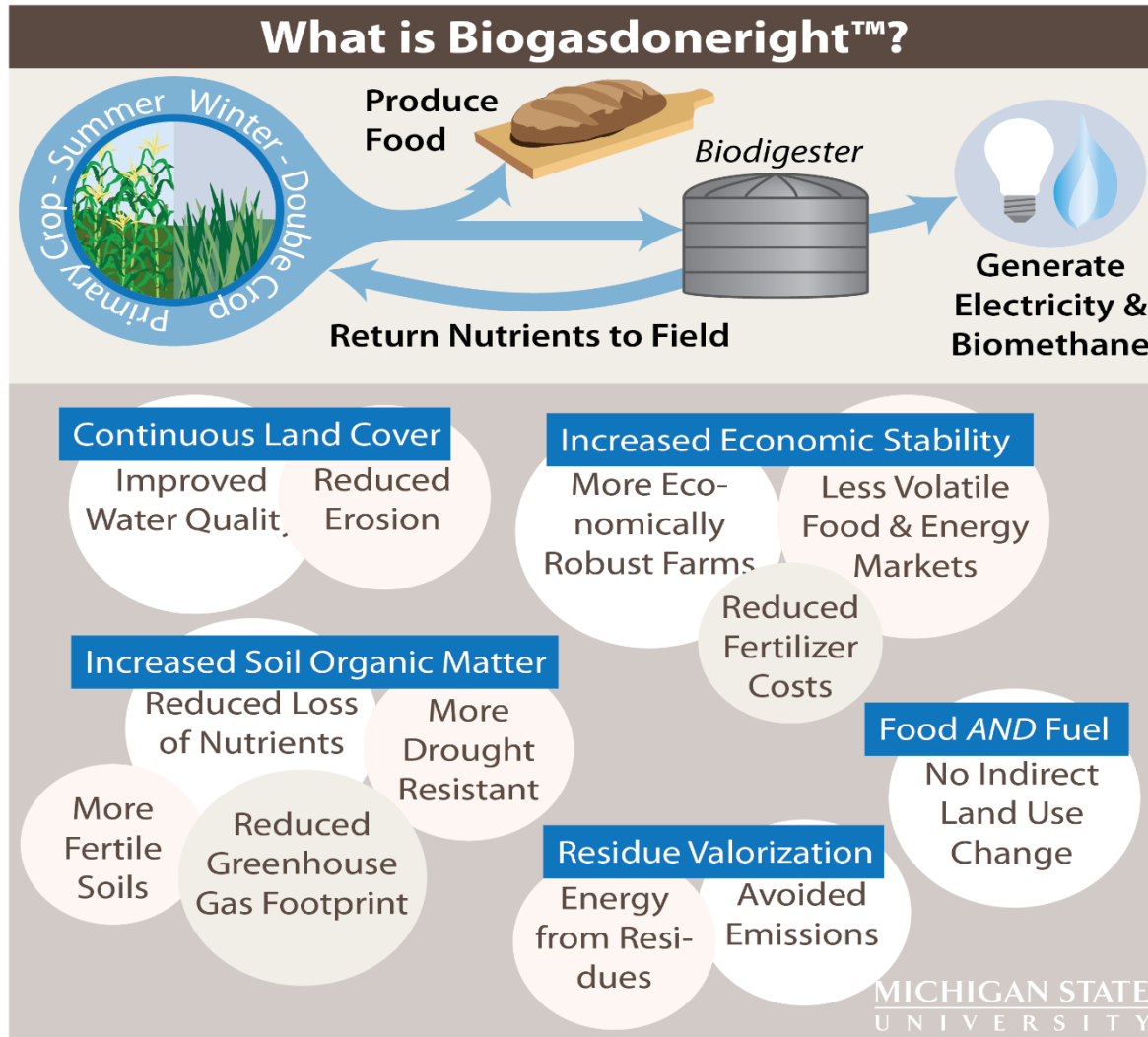
WHAT ARE THE IMPLICATIONS OF THESE TRENDS?

- 7+ billion people on the planet with 2 billion more expected in the next few decades → *food production must expand significantly and soon*
- Modern agriculture and human well-being require lots of energy- currently 85% fossil fuels → *we need large scale renewable energy, soon*
- Atmospheric CO2 just passed 400 ppm and its growth rate is accelerating → *we must remove & store huge amounts of CO2, soon...but wind & solar electricity cannot be carbon negative and cannot meet all energy needs*
- Agriculture is under stress, farms going out of business, based on unsustainable practices → *farmers must cut costs, increase income, try new methods, soon*
- These problems are strongly linked → *thus we must address problems in an integrated way, not “solving” one problem while making another problem worse*
- These problems are not “in the future”—they are here now → *we need proven, available solutions; we must focus research & development on available solutions*
- These problems are rooted in agriculture (land management) → *thus the land managers (farmers) must benefit from solving the problems—or they will not be solved*

EMISSIONS REDUCTION IS NOT ENOUGH: WE NEED LARGE SCALE NEGATIVE EMISSIONS

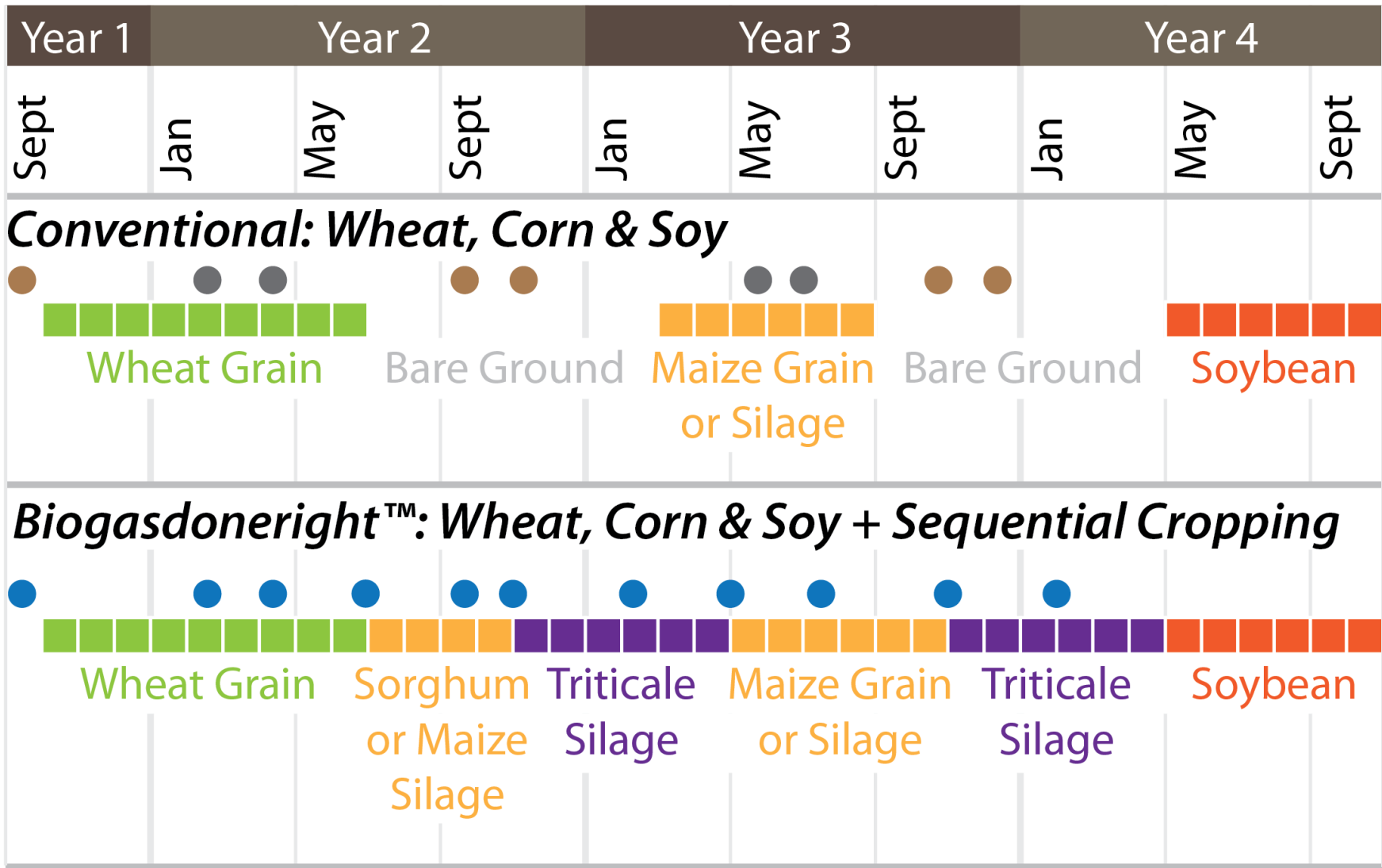


CAN BIOGASDONERIGHT™ CONTRIBUTE TO SOLVING THESE (AND MANY OTHER) PROBLEMS?

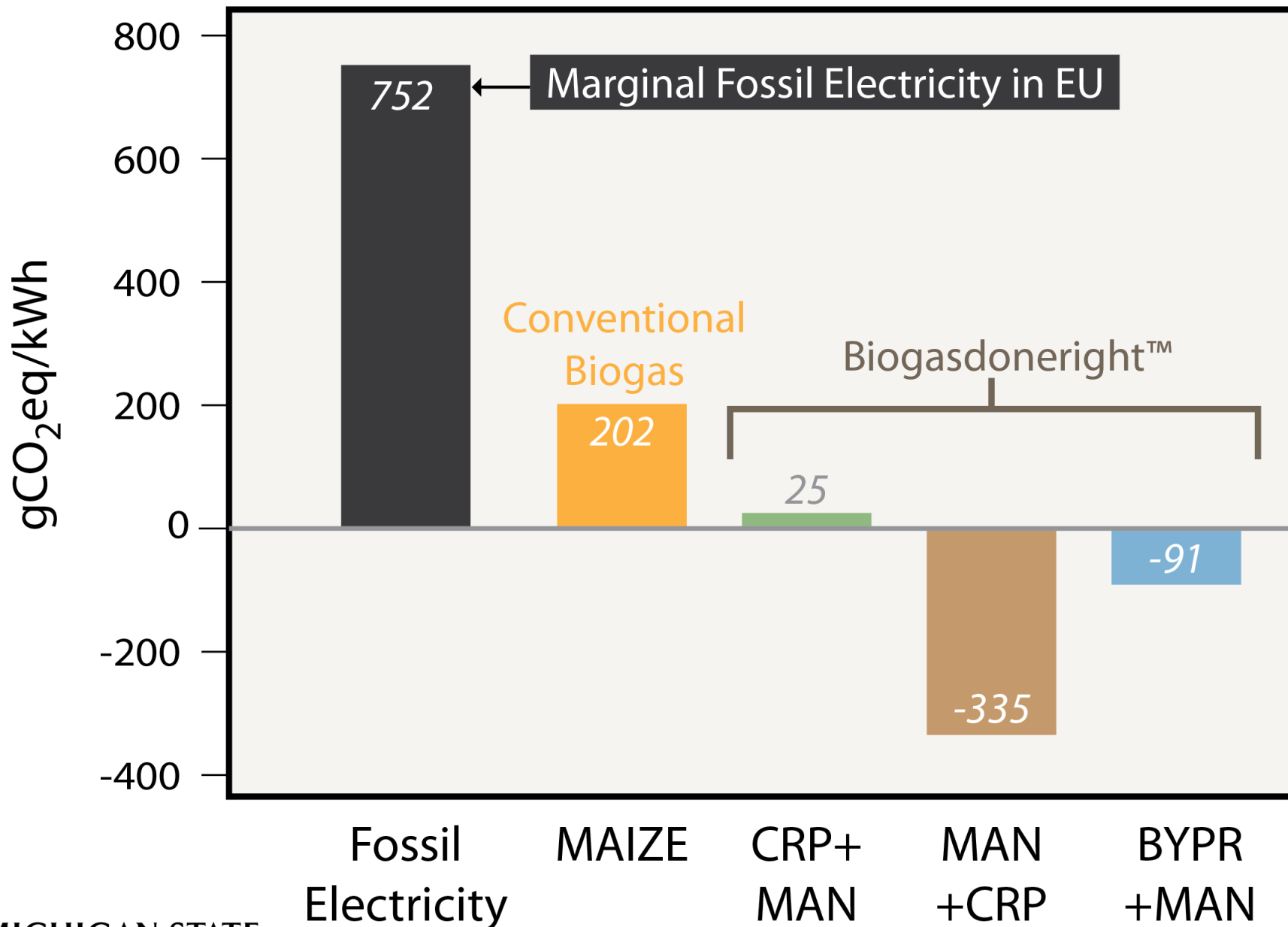


Biogasdoneright™ principles:

- Combine sequential cropping & anaerobic digestion to produce food and energy in circular economy approach
- Recycle plant nutrients and store stable carbon in soils (carbon negative food and energy systems)-dual purpose bioenergy
- Use best practices including: precision tillage, timing nutrient application with plant growth cycle, continuous soil cover
- Improve water quality and soil fertility, increase biodiversity
- Increase economic and environmental resilience of agriculture



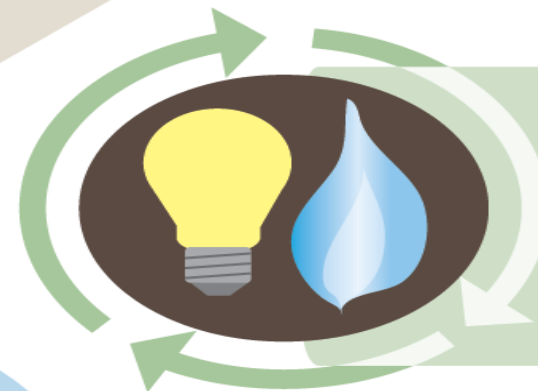
● Chemical Fertilizer ● Livestock Effluent ● Digestate MICHIGAN STATE UNIVERSITY



CAN FARMERS BENEFIT FROM BIOGASDONERIGHT™? YES! (BUT THERE IS A LEARNING CURVE AND THERE ARE RISKS FOR FARMERS)



More Attractive Investments
Market Diversification
Better Cash Flow
More Jobs



Increased Proportion of Renewable Energy in Agriculture



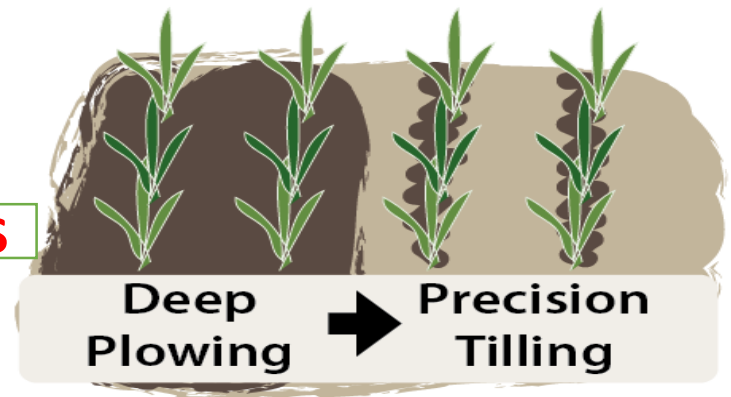
Year-Round Soil Coverage & Double Cropping Systems

BIOGAS-DONE-RIGHT
IMPACT ON FARMERS



Mitigation of Emissions from Livestock Effluent

80%
DECREASE IN FARM INPUT COSTS
CIRCULAR ECONOMY



Green Fertilizer
↓
Reduced Soil Compaction
Improved Nutrient Balance (N, P, K)

THE INTERNATIONAL POTENTIAL OF BIOGASDONERIGHT™: *IS IT EXPORTABLE?*

(OR IS BIOGASDONERIGHT™ ONLY POSSIBLE IN ITALY 😊)

- “The Potential of Argentina” *Jorge Hilbert, Instituto de Ingenieria Rural, Argentina*
- “The Potential of the United States” *Dr. Tom Richard, Pennsylvania State University, USA*
- “BiogasDoneRight™ – a negative emissions technology for delivering net zero emissions by 2050” *Dr. Jeremy Woods, Imperial College, UK*

INTERNATIONAL POTENTIAL OF BIOGASDONERIGHT™ (BDR)



- “The Potential of Argentina” *Ing. Jorge Hilbert*
 - Argentina could replace all of its natural gas imports with biogas produced using BDR principles (\$2.300.000.000 annually, or ~28% of trade deficit)
 - Extremely important in Argentina where gas is 54 % of the total energy consumed
- “The Potential of the United States” *Dr. Tom Richard*
 - Biogas potential in the US exceeds 20% of fossil natural gas.
 - Renewable Fuel incentives are driving rapid growth.
 - Double cropping can also provide water quality benefits
- “BiogasDoneRight – a negative emissions technology for delivering net zero emissions by 2050” *Dr. Jeremy Woods*
 - BDR must play an important role in delivering sustainable development (through meeting the Sustainable Development Goals)
 - BDR can deliver cost effective climate mitigation & adaptation agricultural solutions at costs well below US\$100 per tonne CO2 abated (with some at negative costs)