



# 2013 Biofuels Showcase

**Timothy Donohue**

*Professor of Bacteriology, University of Wisconsin-Madison  
Director, Great Lakes Bioenergy Research Center*

**October 16, 2013**



# Meeting the Energy Needs of a Growing Population

*A Grand Research & Education Challenge for Land Grant Colleges*

# WEI: A Catalyst to Move Forward in Energy

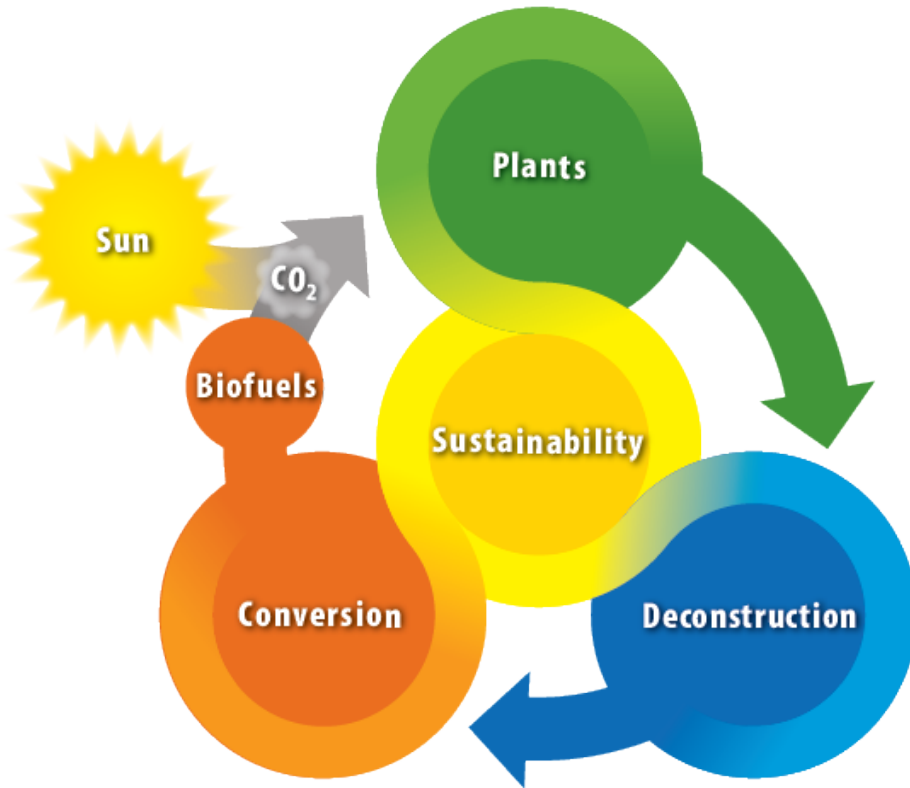
Create, integrate, train & transfer knowledge in energy resources, technology & sustainability



Breakthroughs in key areas of the energy sector:

- **Liquid fuels and transportation systems**
- Energy storage (thermal & electrical) and utilization
- Carbon neutral sources of electricity sources
- Policy, economics & societal impact of energy challenges
- Train future energy leaders

# Great Lakes Bioenergy



Perform the **basic research** that generates technology to **convert cellulosic biomass to ethanol and advanced biofuels**

*(GLBRC Roadmap, 2008)*

- Began 2007, approved for funding through 2017 (~265M)
- 475 scientists, students & staff in US and Canada
- **DOE Office of Science, Biological & Environmental Research**

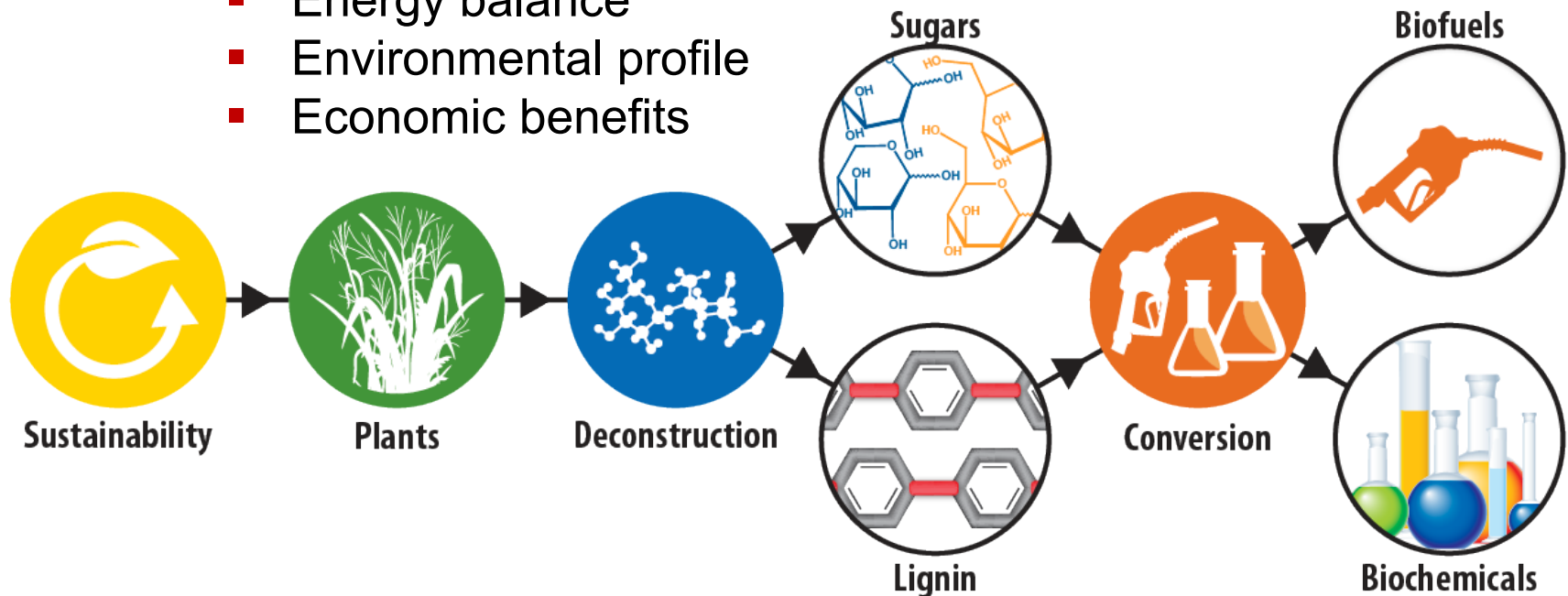
# Key Strategies to Achieve Mission

## Capitalize on resources of partners

- Researchers/Staff
- Land Grant Universities
- National labs
- Technology transfer/Industry

## Focus on sustainable integrated solutions

- Energy balance
- Environmental profile
- Economic benefits



# Great Lakes Bioenergy Local Partners

## Host Institutions (farm to bench to combustion)



MICHIGAN STATE  
UNIVERSITY



De-Risking and Scale-Up  
of Bio-Based Technologies

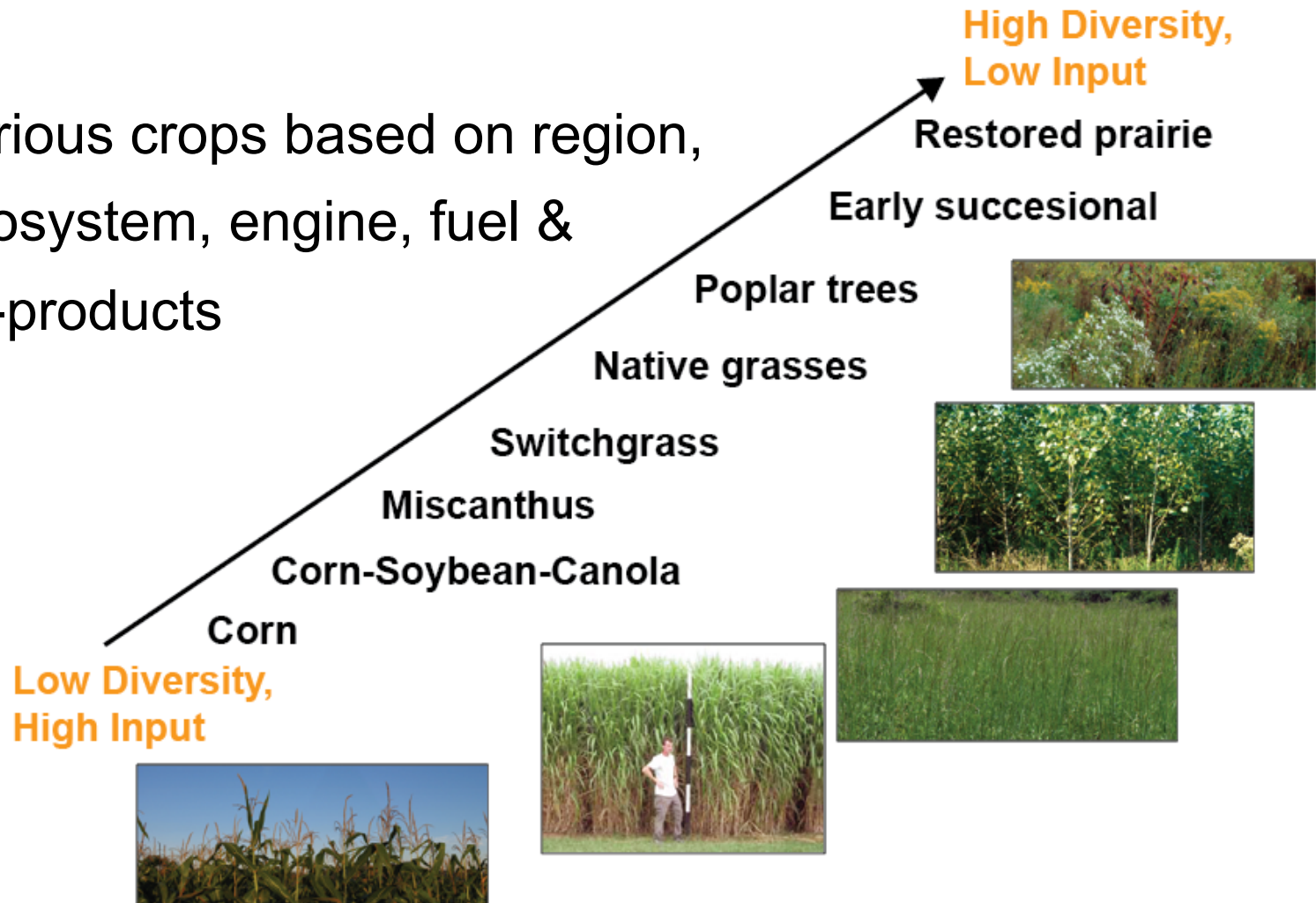
## External Funding (DOE, USDA)



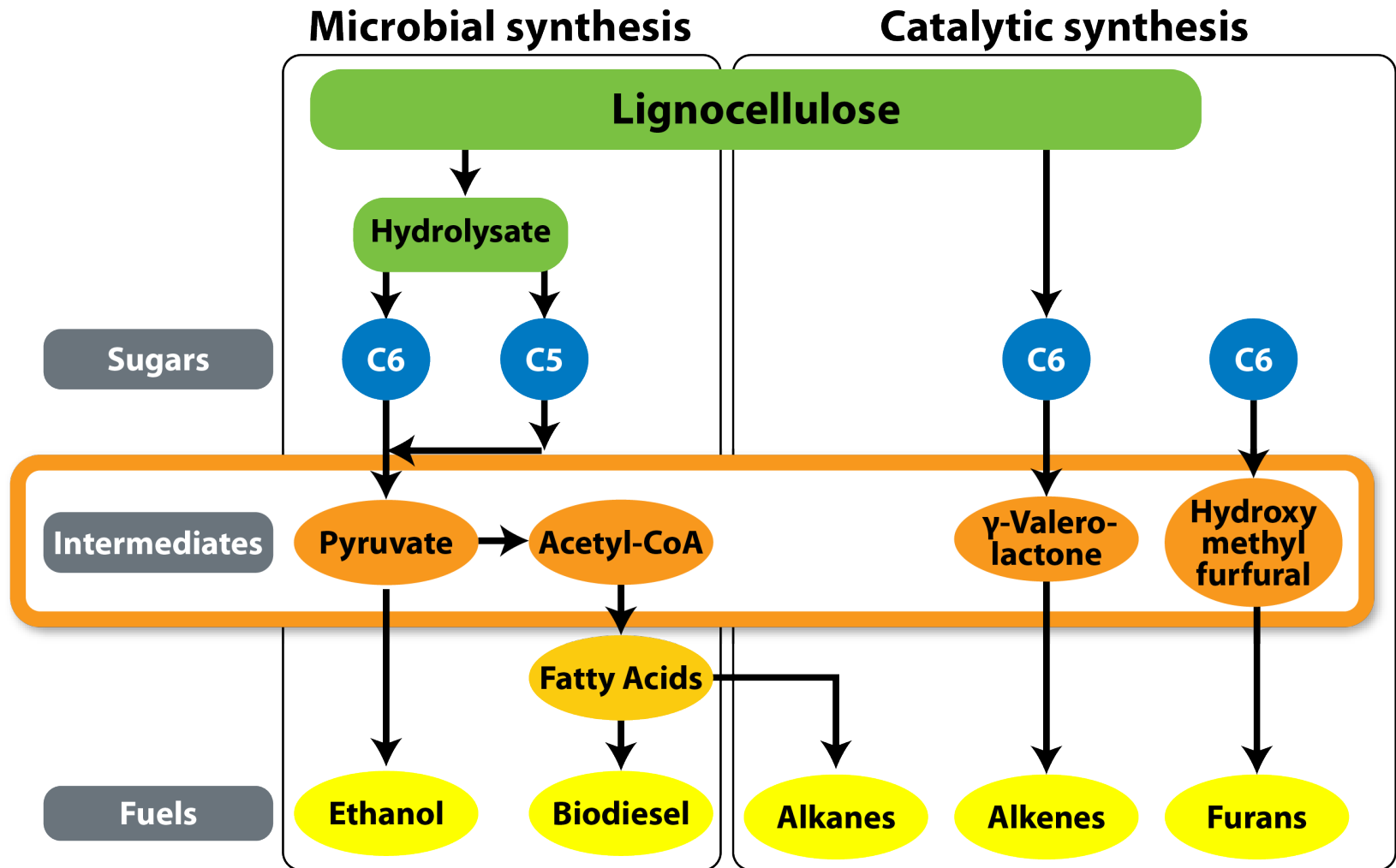
# Great Lakes Bioenergy Research Roadmap

Success of cellulosic biofuels depends on “multiple winners”

- Various crops based on region, ecosystem, engine, fuel & co-products



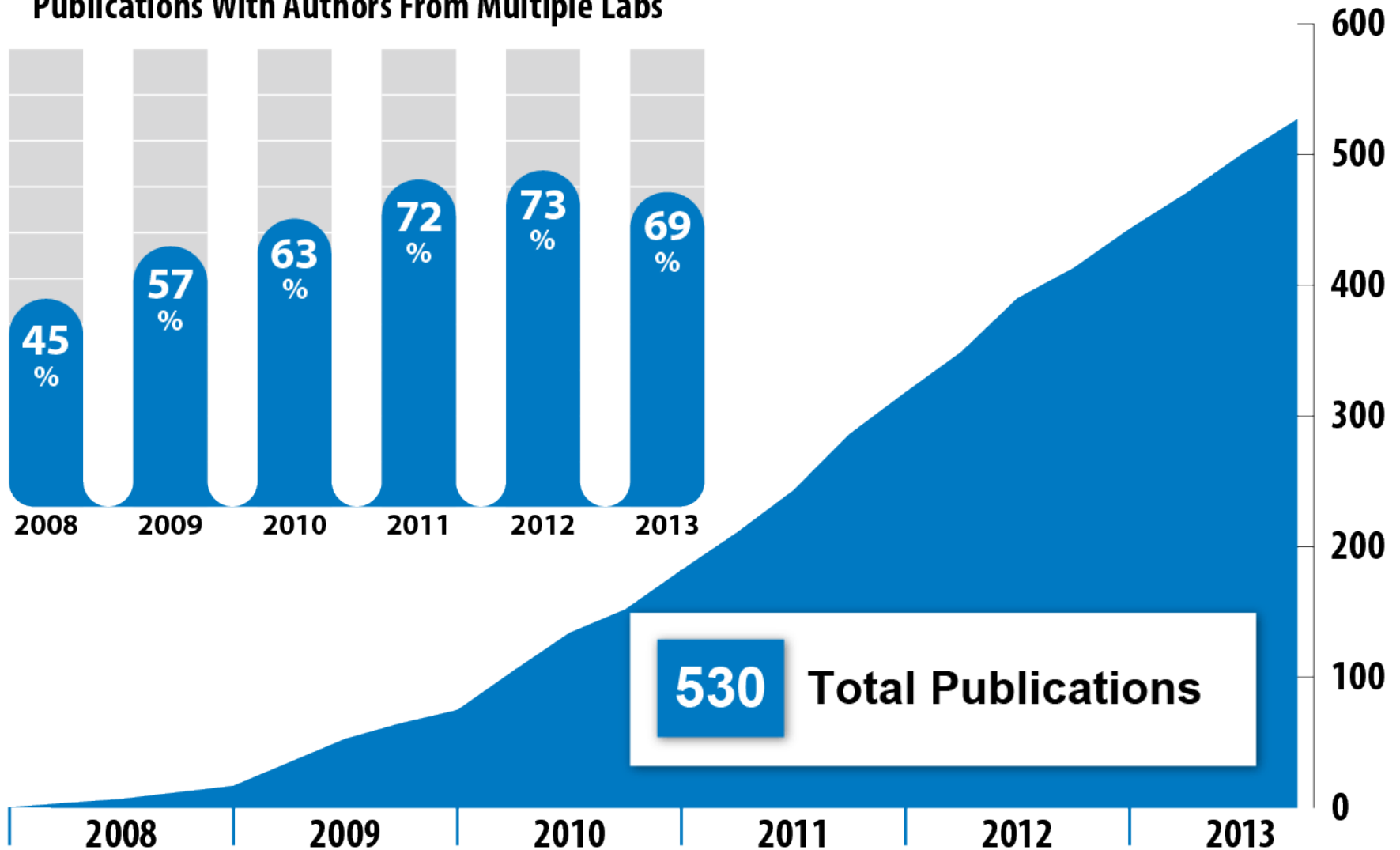
# Strategic Intermediates Enable Biofuels Production



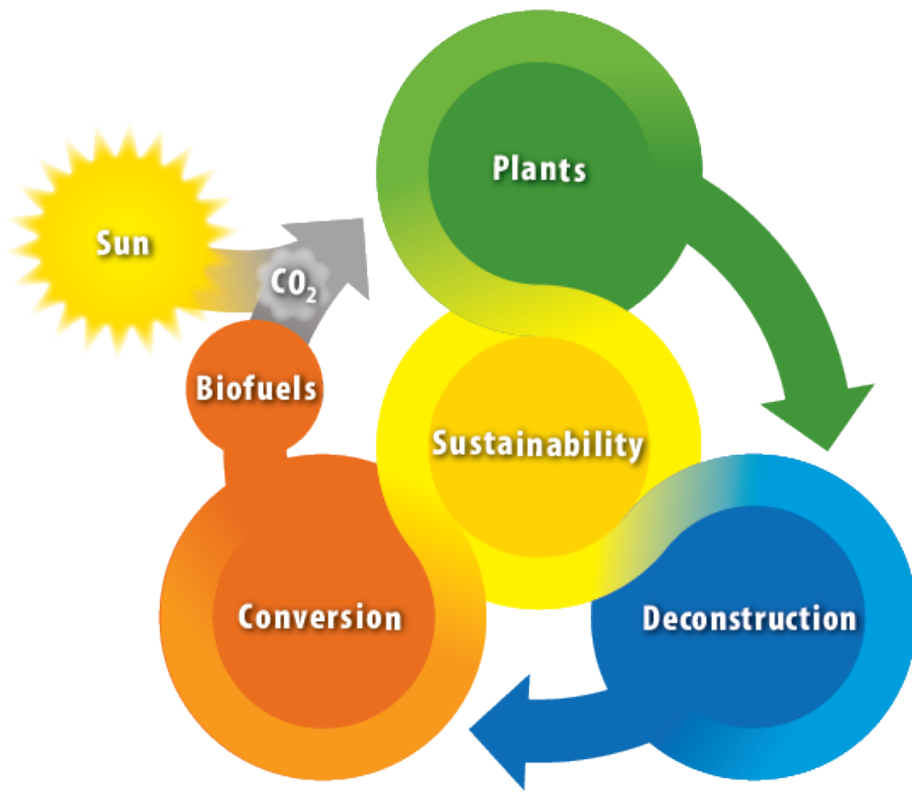


# Benefits of Research Integration

## Publications With Authors From Multiple Labs



# Moving Advances to the Private Sector



Perform the basic research that **generates technology** to convert cellulosic biomass to ethanol and advanced biofuels

*(GLBRC Roadmap, 2008)*

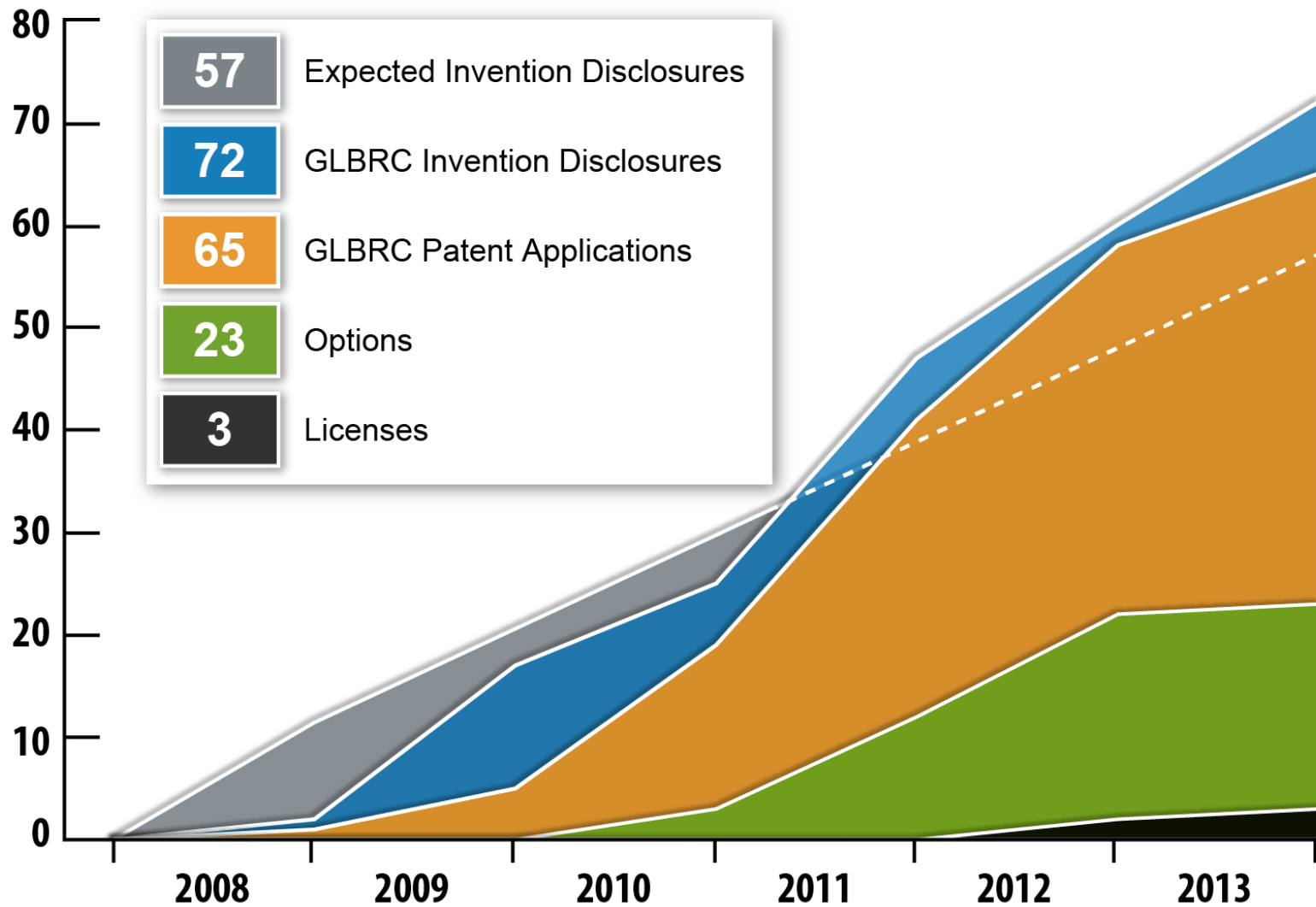
# Moving Advances to Private Sector



- Evaluate inventions
- De-risking & economics
- Patent & commercialize
- Sponsored research to improve technology



# IP Benefits of Research Integration



# Engaging the Private Sector



NIDUS



DSM

BRIGHT SCIENCE. BRIGHTER LIVING.



Borregaard  
LignoTech

ExxonMobil



# Renewable Energy Solutions: The next (& obvious) venue for the *Wisconsin Idea*

