

BioEnergy

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BOISE STATE
UNIVERSITY



Idaho State University



Idaho National Laboratory

University of Idaho

CAES

Center for Advanced
Energy Studies



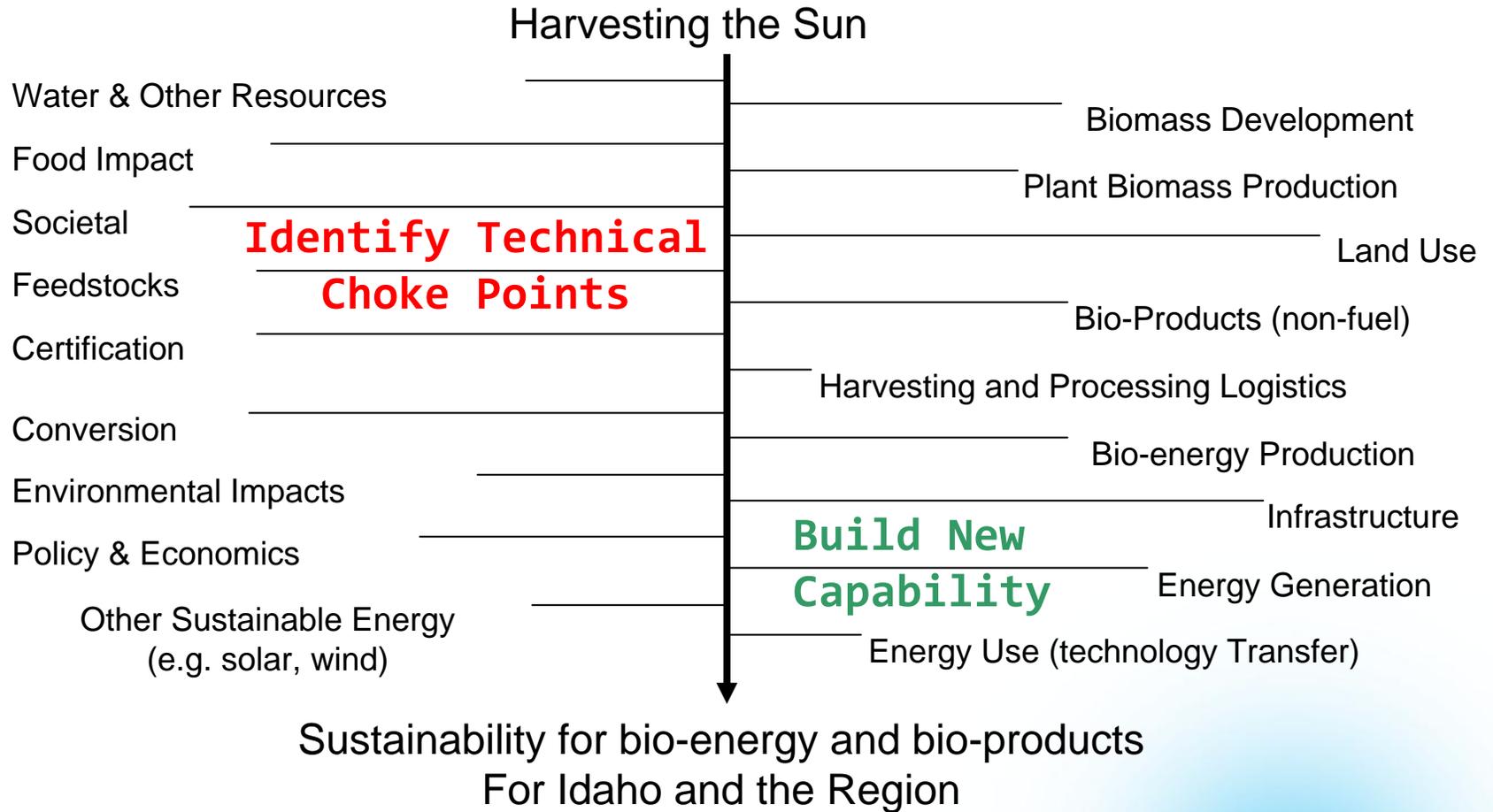
BioEnergy Mission and Focus

- We will, as a collaborative effort between INL, ISU, BSU, and UI, develop needed capabilities and conduct multifaceted research addressing specific technical challenges associated with viable, sustainable utilization of regional biomass resources for the production of biofuels, bioenergy, and products.
- Focus will be on the following:
 - The Entire Seed to Energy Life Cycle
 - Utilizing Pacific NW forestry and agricultural resources
 - Biofuels as primary product target
 - Developing and using LCA tools to target research needs
 - Capitalizing on specific institutional strengths

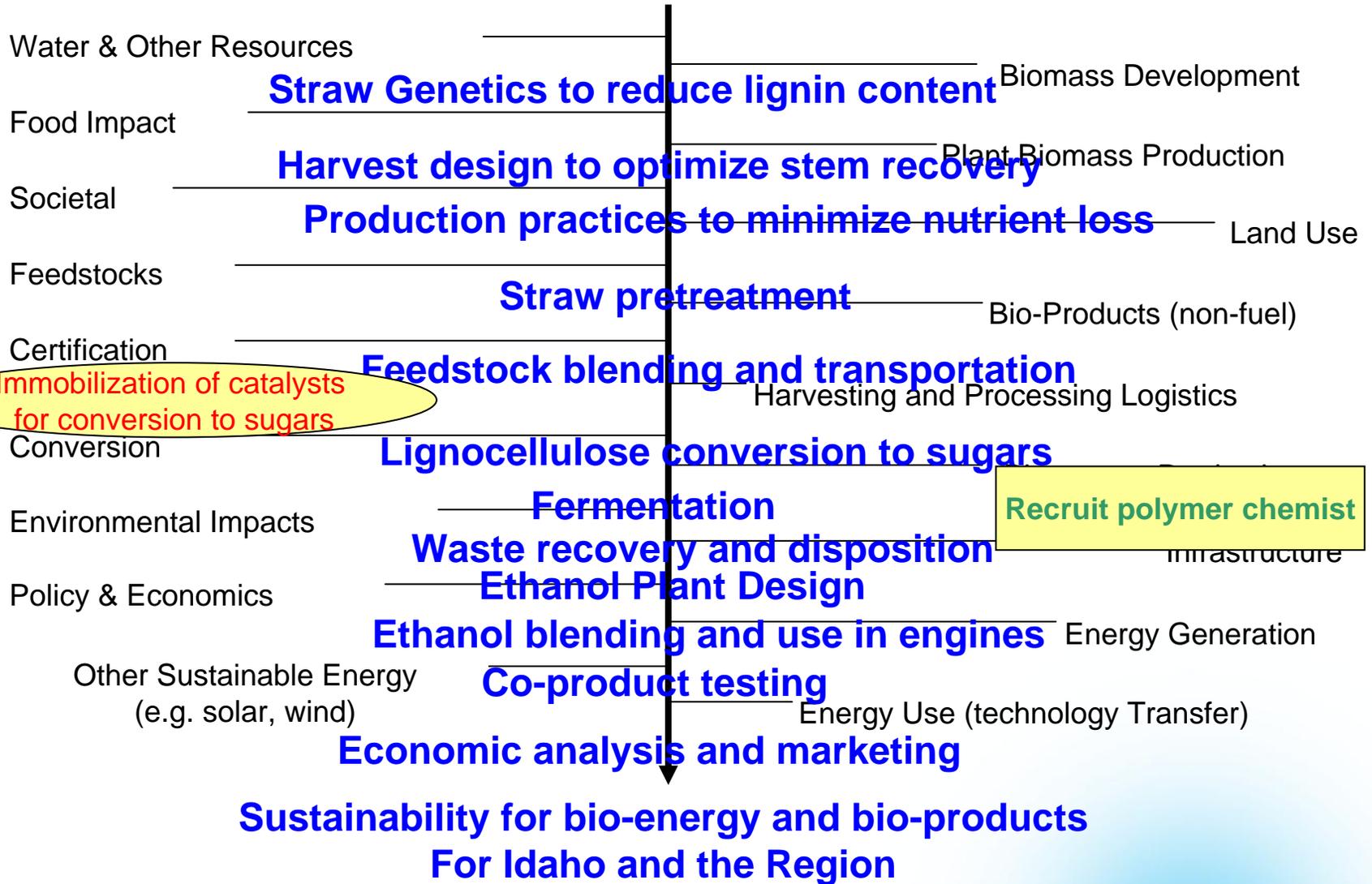
Sustainable Bioenergy Systems from Ag and Forestry Resources

- Outcomes:
 - A coordinated research and education effort and capabilities that deliver solutions to enable the Nation's bioenergy industry
 - A viable biofuels industry in Idaho
- Customers:
 - State of Idaho
 - DOE
 - Bioenergy Industrial Partners
- Biofuels such as ethanol and biodiesel are specific areas of expertise by the institutions and enabling cost competitive production of these products will be a market focus
- Resource owners, i.e. forestry and agricultural producers will be key partners

Systems Approach



EXAMPLE: Ethanol from Wheat Straw



Long Term Goals

- Stand up a self-sustaining Bioenergy Center
 - Multiple sources of Federal and State funding
 - Industrial partner support – matching funding
 - Cooperation and support from agriculture and forestry industry
- Be recognized as Idaho's BioEnergy resource
 - By OER
 - By industry

Initiative – Short Term Goals

- Develop a “Center” Strategic Plan
- Secure research funding >\$1M/year by end of FY11
- Secure financial commitment/in kind contributions/memberships – 3 industrial partners for Center by end of FY11
- Establish recognition – 3 peer reviewed joint publications by FY11
- Participate in OER goal to establish REEZ
- Increased student involvement: 1 new PhD and 1 new MS student in FY10
- Initiate one new LDRD by FY11

Initiative – Strategy and Tactics

- BioEnergy Center strategy workshops
 - Initial workshop held Sept. 2, 2009
 - 3 Follow up workshops in FY10, next one November 9, 2009
- Alignment with Feedstocks Assembly Program
- EPSCoR, SBOE, EERE Proposals
- Student preparation of review paper for publication
- Continued participation with OER and Idaho Strategic Energy Alliance
- LDRD deliverables:
 - Characterization of feasibility of lignocellulosic feedstocks
 - Identification and encapsulation strategies for catalysts appropriate to those feedstocks
 - Engineering design for incorporation of those feedstocks
 - 2 Peer reviewed publications

Initiative Outcomes: Projects

Year (\$)	Project	Customer	Collaborators
FY 2009	*\$150K Lignocellulosic Ethanol Potential in Idaho	LDRD	UI, ISU, BSU
Total \$	*\$150K		
FY 2010	*\$150K Lignocellulosic Ethanol Potential in Idaho	LDRD	UI, ISU, BSU
	*\$2.3M/3 yrs Ecologically Sustainable and Socioeconomically Responsible Production of Biofuels and Biproducts	DOE EPSCoR	UI, ISU, BSU
Total \$	\$1M/3 yrs BioEnergy/BioProducts Center	Idaho SBOE	UI, ISU, BSU
	\$400K Feasibility of Biomass Gasification Technology to Produce Electricity and Liquid Fuels from Manure	Idaho Office of Energy Resources	Counties, Dairy Cooperative, INL, UI
FY 2011	*\$150K Lignocellulosic Ethanol Potential in Idaho	LDRD	UI, ISU, BSU
Total \$	\$100K New LDRD defined by center	LDRD	

Initiative Outcomes: Highlights

- Current faculty engaged in current research project (4)
 - UI – 1; ISU – 1; BSU – 1; INL – 1
- Current students (3)
 - 1 PhD under way
 - 1 MS under way
 - 3 Undergraduate
- 2 new proposals in preparation

Initiative – Investments



FY09 Total: \$165K	\$150K LDRD \$15K PDF \$0K Capital Equipment
FY10 Total: \$180K	\$150K LDRD \$30K PDF
Multi-Year Total: \$300K/yr	\$250K LDRD \$50K PDF

Initiative Investments

- LDRD: Development of Lignocellulosic Ethanol Production Potential in Idaho
- \$150K/yr FY09, FY10, FY11
- This project is designed specifically to address the technical challenges of utilizing novel available lignocellulosic feedstocks in Idaho and the region to produce biofuels economically. Proposed LCA approaches will help determine other challenges that must be addressed for economical sustainability

Initiative Investments

- PDF (2009 and 2010)

Activity	2009 \$	2010 \$
Proposals: LCA for Idaho Ethanol EPSCoR Proposal SBOE Proposal REEZ Proposal	PDF: \$7K ROI: 0	No PDF Potential ROI: \$2.3M No PDF Potential ROI: \$1M PDF: ?? Potential ROI: \$400K
Meetings: Center Workshops: Meetings with Industry	PDF: \$2K PDF: \$6K	PDF: \$15K PDF: \$15K
Other		

Initiative – Infrastructure and Human Capital

- Equipment:
 - UI providing pilot scale engineering equipment for testing lignocellulosic feedstock incorporation (LDRD). Larger scale testing capability may become issue in future
- Facilities:
 - Current research and modeling efforts accommodated at each institution. Need to utilize CAES facilities for testing and modeling anticipated in FY11 and beyond
- Staffing:
 - UI Bioenergy faculty position proposed

Initiative – Discussion Points

- Each institution currently participating in proposal and research efforts
- Investment and commitment by each institution will be required initially to successfully stand up a “center”
- Engagement with BSU Energy Policy Institute needed
- Need for better involvement/engagement with INL Feedstock Assembly Program and insights into DOE EERE requirements

Cross-Cutting Discussion Points

- BioEnergy Center directly aligned with CAES and UI missions; less so with BSU and ISU.