U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Agile BioFoundry Peer Review Panel

5 April 2023

Gayle Bentley

Your host for this session

BETO Conversion Technology Manager

Agenda Overview

DAY 3 – Wednesday, April 5, 2023					
8:30 AM	8:45 AM	15	Technology Area Daily Intro	BETO	Gayle Bentley
8:45 AM	9:15 AM	30	Funding and Partnering Mechanisms	ABF	James Gardner
9:15 AM	9:27 AM	12	ABF DFO with Invaio	ABF - DFO	Jon Magnuson
9:27 AM	9:39 AM	12	ABF DFO with Super Brewed Foods	ABF - DFO	Adam Guss
9:39 AM	9:51 AM	12	ABF DFO with U Delaware/WashU	ABF - DFO	Deepti Tanjore
9:51 AM	10:03 AM	12	ABF DFO with Enduro Genetics	ABF - DFO	Deepti Tanjore
10:03 AM	10:15 AM	12	ABF DFO with Kalion, Inc	ABF - DFO	Violeta Sanchez i Nogue
10:15 AM	*10:30 AM*	*15*	*Break*		*All*
10:30 AM	10:42 AM	12	ABF DFO with C16 Bio	ABF - DFO	Di Liu
10:42 AM	10:54 AM	12	ABF DFO with Pyrone	ABF - DFO	Alberto Rodriguez
10:54 AM	11:06 AM	12	ABF DFO with Danimer	ABF - DFO	Gregg Beckham
11:06 AM	11:18 AM	12	ABF DFO with Technology Holding Inc	ABF - DFO	Gregg Beckham
11:18 AM	11:30 AM	12	ABF DFO with iMicrobes	ABF - DFO	Eric Sundstrom
11:30 AM	12:00 PM	30	ABF Panel Discussion	ABF	James Gardner
12:00 PM	*1:00 PM*	*60*	*Lunch*	*All*	
1:00 PM	2:00 PM	60	ABPDU - Operations Project	ABPDU	Deepti Tanjore
2:00 PM	2:30 PM	30	ABPDU - Reflection from Industry Collaborators	ABPDU	Deepti Tanjore
2:30 PM	3:00 PM	30	ABPDU - Research and Synergistic Efforts	ABPDU	Deepti Tanjore
3:00 PM	3:30 PM	30	ABF Closing discussion	ABF	Gayle Bentley, Nathan Hillson
3:30 PM	*3:50 PM*	*20*	*Break*	*All*	
3:50 PM	*4:30 PM*	*40*	*Closed Door Comment Review Session*	*Reviewers*	

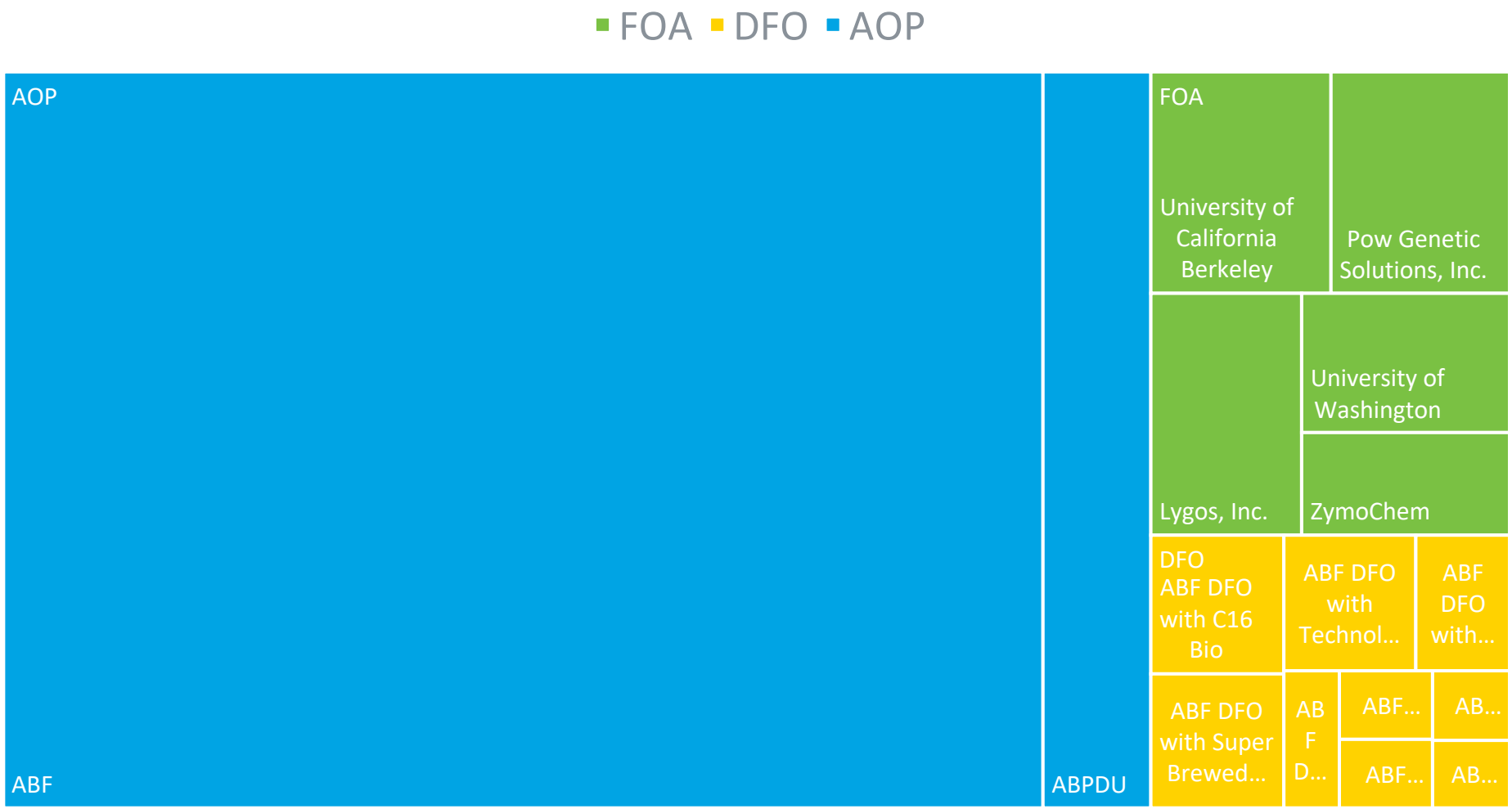
Reviewer Introductions

Welcome back, Reviewers!

Name	Affiliation
Karen Draths	Michigan State University
Brentan Alexander	CIO, Synonym
Doug Friedman	CEO, BioMADE
Ramana Madupu	DOE Office of Science
Hanny Rivera	Ginkgo Bioworks
Gale Wichmann	Amyris
Fuzhong Zhang	Washington University in St. Louis

Ground Rules
Presenters: We will give you a 5 minute warning. When your time is up, we will verbally let you know. Please wrap up quickly.
Reviewers: Please ask questions during the Q&A period. Be considerate to allow all reviewers the opportunity to ask a question.
General public: We will field questions as time allows after the reviewers have asked questions.

Portfolio Funding Overview



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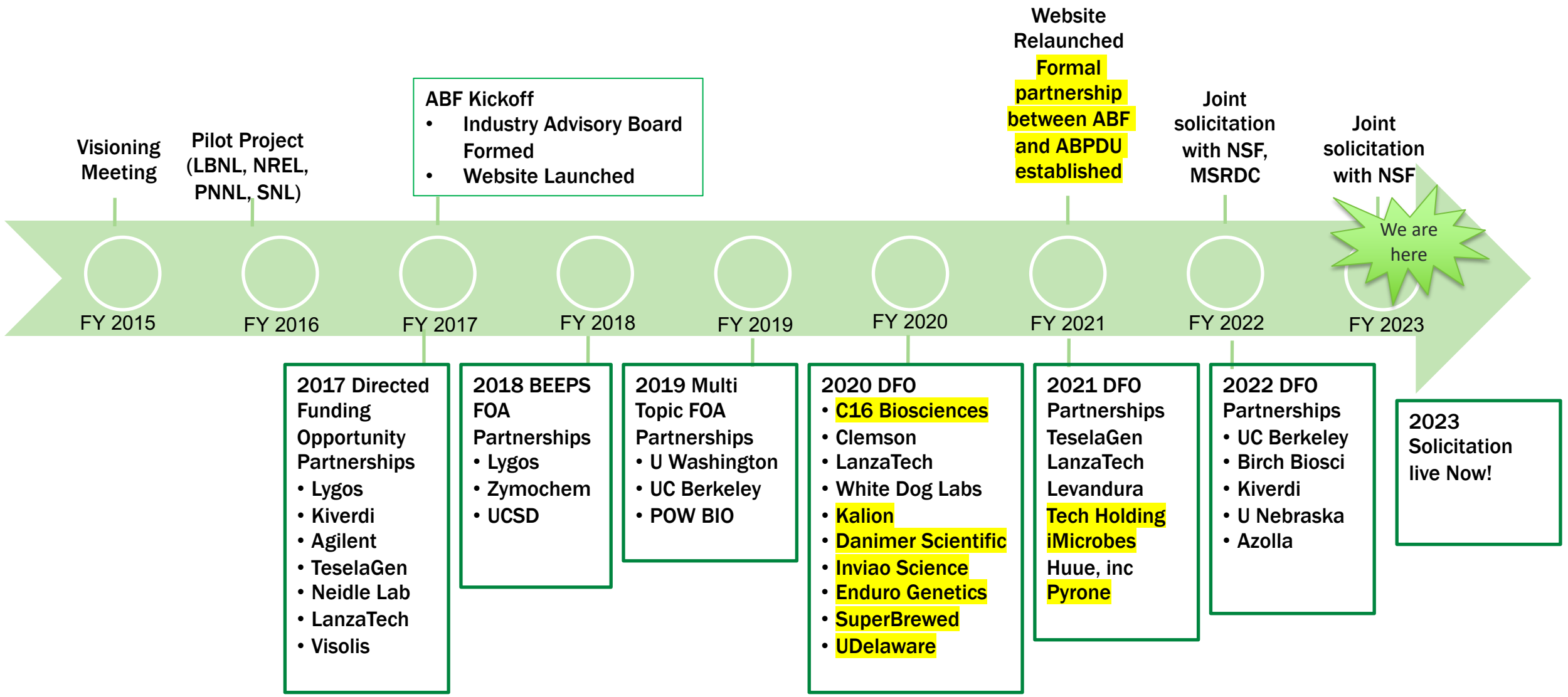
ABF Timeline and History



Directed Funding Opportunities (DFO) vs Funding Opportunity Announcements (FOAs)

Directed Funding Opportunities (DFOs)

- Process run by the National Laboratories (ABF)
- ABF works with applicants on proposal
- DOE can advise on topics of interest and process
- External merit review informs recommendations
- Recommendations made by the ABF to the DOE
- Funding goes to the ABF with cost share from industrial/academic partners
- Use of CRADA as project vehicle – ABF funding managed through National Laboratory contract
- Statement of work negotiated by ABF and approved by DOE

Funding Opportunity Announcements (FOAs)

- Process run by the DOE
- ABF works with applicants on proposal
- DOE mandates topics of interest and process
- External merit review informs recommendations
- Recommendations made by the Federal Consensus Board to the DOE selection officials
- Funding goes to external prime- and sub-recipients and to the ABF with cost share from those partners
- Use of CRADA as project vehicle – ABF funding managed through National Laboratory contract in addition to normal DOE funding to FOA recipient
- Statement of work negotiated by DOE

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Directed Funding Opportunities (DFO) vs Funding Opportunity Announcements (FOAs)

Directed Funding Opportunities (DFOs)

- Opportunity for smaller targeted awards in addition to larger awards
- Application 5-7 pages + simple additional information
- Time from announcement to selections ~5 months

Funding Opportunity Announcements (FOAs)

- Minimum award size ~1.5M to be practical
- Application ~25pg technical volume + a variety of additional information
- Time from announcement to selections ~7 months

Additional opportunities for Strategic Partnership Projects (SPPs), Small Business Innovative Research (SBIR), Tech Commercialization Fund (TCF)

Funding mechanisms

	FOA	AOP	CRADA
Selection Method	Competitive	Lab Call	Competitive
Open to the Public	✓	☒	✓
National Lab Participant	Only as Subrecipient	✓	✓ *
Go/No-Go Decision Points	✓	✓	☒
Verifications	✓	☒	☒
Award Modifications Method	Contracting Officer (CO)	AOP Tool Change Control	AOP Tool Change Control

FOA = Funding Opportunity Announcement

AOP = Annual Operating Plan

CRADA= Cooperative Research and Development Agreement

*Funding *only* at National lab as a part of their AOP budget to work on collaborative scope of work

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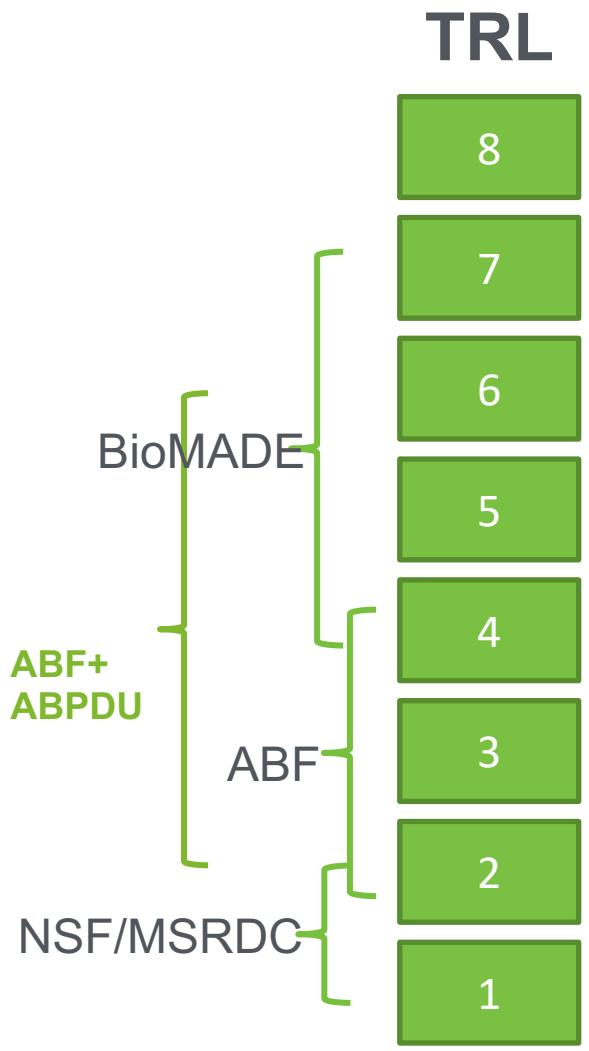
Strategy for collaborative work

- **ABF + NSF**: $1M ABF DFO, plus $4-5M from NSF. Support for collaborations between NSF-supported academic PIs and DFO-supported ABF teams.
- **ABF + MSRDC**: $1M DFO. Expand ABF partners to PIs at minority serving institutions
- **ABF + BioMADE***: $2M DFO. Provide a route to mature ABF technologies and provide ABF support to BioMADE
- **Core ABF DFO**: $1-5M. Depends on budget. Will focus on advancing core BETO decarbonization goals



ABPDU and ABF are formal partners

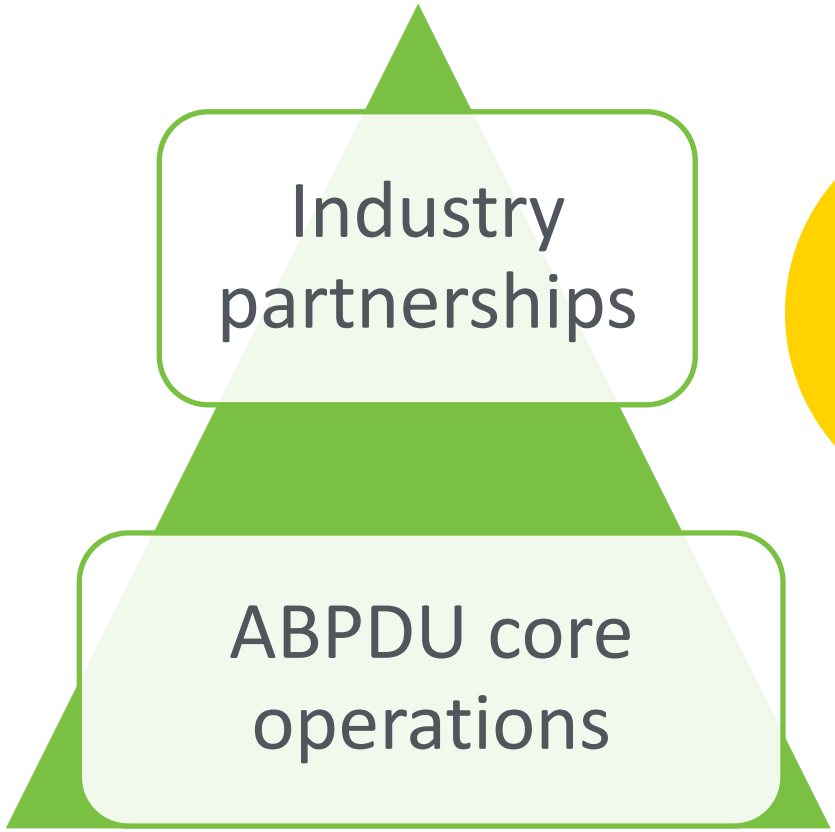
- ABPDU was a part of the Systems Development and Integration Portfolio prior to 2021.

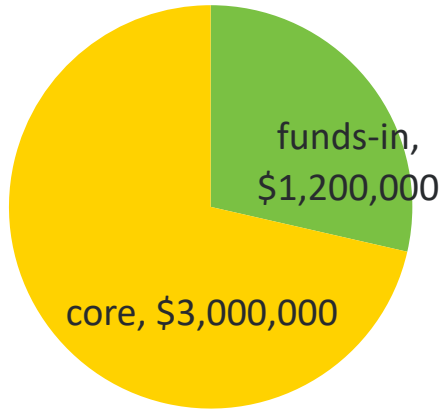
ABPDU meets BETO strategic goals:

- Lowering the cost of production through increased efficiency, productivity and yields; and
- Completing applied research and development on complex, real world systems, and integrating engineering processes for promising new advanced bioenergy technologies

ABPDU provides critical bioprocess scale-up infrastructure, and is the preeminent facility for scale up process development.

- ✓ Support industry
- ✓ Support other BETO projects
- ✓ Support academia





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ABF, SepCon, and ABPDU form a pipeline to commercialize bioproducts

ABF builds the synthetic biology infrastructure to accelerate bioprocess development

Bioprocessing Separations Consortium develops the downstream processing technologies to isolate products

Advanced Biofuels and Bioproducts Process Development Unit (ABPDU) provides process development and scale up demonstration infrastructure to take commercial products to market

ABF Partners

BIRCH BIOSCIENCES
huue.
LanzaTech
PHYCUS BIOTECHNOLOGIES
ENDURO
Agilent
SUPERBREWED FOOD
KALION, INC.
iMICROBES
TECHNOLOGY HOLDING SUSTAINABLE SOLUTIONS
LYGOS
danimer scientific
KIVERDI
PYRONE SYSTEMS INC.
invaio sciences A FLAGSHIP PIONEERING COMPANY
ZymoChem NEXT-GENERATION MICROBES FOR INDUSTRIAL CHEMICALS
North Texas
University of Georgia
Berkeley
University of Wyoming
teselagen BIOTECHNOLOGY
AZOLLA
VISOLIS CARBON NEGATIVE MATERIALS
c16 BIOSCIENCES
University of Delaware
University of Nebraska Lincoln
UC San Diego
University of Washington

BOLT THREADS
Silk and leather textiles

CHECKERSPOT
Triglyceride polymers for eco-friendly skis

EVERY
EVERY Egg White

AFATER
Recycled cellulose

Geltor
Biodesigned, animal-free collagen

GINKGO BIOWORKS THE ORGANISM COMPANY
Perfume ingredients

KALION, INC.
Glucaric and glucuronic acid

Oobli
Sweet proteins from plants for healthier foods

LYGOS
Malonic acid

MANGO MATERIALS
Sustainable PHA for bioplastics

VISOLIS
Mevalonic acid for skincare

mosaic
Metal organic frameworks

MycoWorks
Fine mycelium for leather

PERFECT DAY
Animal-free dairy proteins

ripple
Pea protein for milk products

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Questions?