

# Carbon Recycling Forum Pathways To Implementation

David Haberman  
IF, LLC  
Phoenix, Arizona

# Agenda

## Tuesday, Sept 16

4:30 – 6:30 pm

Reception & Registration

Sponsored by  
**PARSONS**

## Wednesday, Sept 17

7:30 am

Registration

7:30

Continental Breakfast

8:00

Welcome

8:10

Forum Organization

8:20

APS Integrated Strategy

9:30

Coffee Break

9:50

Carbon Management

10:50

Roadmap Exercise

12:00

Lunch

13:15

Algae Technology

14:30

Coffee Break

14:50

Carbon Regulations

15:45

Algae Based Fuels

16:45

Adjourn

Scott Klara, NETL

David Haberman, IF, LLC

Ray Hobbs, APS

Scott Klara, NETL

David Haberman, IF, LLC

Isaac Berzin, IDC

Doug Smith, VNF

Dave Daggett, Boeing

Mark Crocker, Univ. of Kentucky

# Thursday Agenda

7:30 am	Registration	
7:30	Continental Breakfast	
8:00	Welcome	Dan Cicero, NETL
8:10	Forum Organization & Roadmap	David Haberman, IF, LLC
8:30	University of Colorado	Allan Weimer
9:00	University of Kentucky	Mark Crocker
9:20	Auburn University	Ron Putt
9:40	Utah State	Jeff Muhs
10:00	Coffee Break	
10:20	Carnegie Mellon University	Mike Domach
10:40	Innovators Panel	
	Prometheus	John Barclay
	Phycal	Bob Polak
	SRI	Barb Heydorn
	Universal Biodiesel	Mike English
12:00	Lunch Presentation	Isaac Berzin, IDC
13:00	UND-EERC	Tom Erickson
13:30	Boeing	Dave Daggett
14:00	General Atomics & Texas A&M	Dave Hazlebeck
14:30	Coffee Break	
14:50	Desert Biofuels	Eric Johnson
15:10	University of Arizona	Joel Cuello
15:30	Algae Biosciences	Andrew Ayers
15:50	Solix	Bryan Willson
16:10	Arizona State University	Jerry Lin
16:30	Diversified Energy	Jeff Hassannia
16:50	Adjourn	

# Implementation Goals

- Minimize Costs Of Carbon Management
- Implementation Risk Reduction
- Policy & Regulatory Support
- Continuing Efficiency Improvement
- Broad Stakeholder Involvement
- Gaining Public Confidence
- Economic Development & Competition
- Build National Knowledge Base

# Session Objectives

- Identify Obstacles & Barriers
- Technology Readiness
- Risk Inventory
- Policy & Regulatory Suggestions
- R&D Criticality
- Government Role
- Industry Role
- Academia's Role

# Forcing Functions For Change

- Carbon Management
- Fossil Fuel Supply Instability & Costs
- Environmental & Public Health Concerns
- Water Resource Stewardship
- National Security
- Economic Development

# Customers

- Utilities & Regulators
- Public – Transportation Fuel
- Industry – Energy & Fuel Market Participation
- Communities – Economic Development
- All – Seeking Energy & Fuel Cost Stability

# Obstacles & Barriers

- Reference System In Place
- No Due Diligence
- No Regulatory Recognition
- No Implementation Cost Confirmation
- Little Downstream Market Pull
- No Reliable Implementers
- Resource Use (Water)

# Technology Readiness

- Algae Biology
- Growth Environments
- Connectivity To Power Plants
- Algae Processing (Dewatering & Oil Extraction)
- Algae Oil Based Product Manufacturing
- Algae Meal Based Product Manufacturing

# Risk Inventory

- Technology Performance
- Intellectual Property
- Qualification As Allowable (Regulations)
- Power Plant Connectivity
- Environmental Impact
- Financial Performance
- Reliable Implementers

# Policy & Regulatory Suggestions

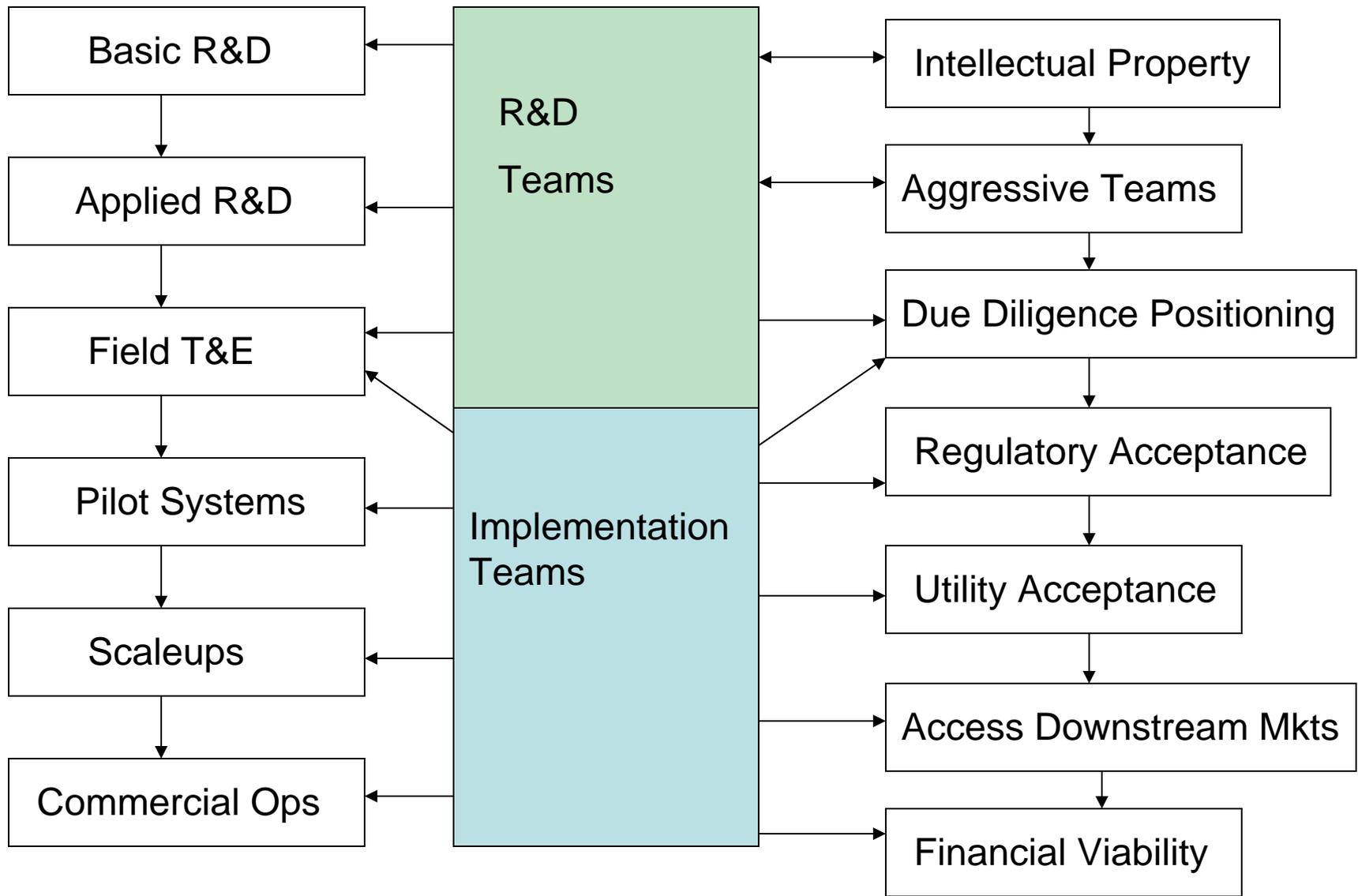
- Applicable Regulations Allow Use?
- Analyze Need For New Regulations
- Qualification Regime
- Monitoring Regime
- Enforcement
- Comparative Database
- Competitive Supply Base

# R&D Criticality

- NETL & APS Project
- DARPA
- Universities
- Industry IR&D
- Innovators & Small Business
- NGOs
- States

# Roles

- Government Role
- Industry Role
- Academia's Role
- Utilities
- Regulators
- NGOs



# Supporting Progress

- Support Broad-Based National Effort
- Establish A National Dialog
- Inform Policy & Regulators Responsibly
- Minimize Zero-Sum Game
- Establish A Qualification Method For Regs
- Build Confidence Along Entire Value Chain
- Increase Funding To Promote Innovation
- Articulate Benefits To Nation
- Encourage Competition

# Next Steps

- Share The Content & Results Of Forum
- Building Networks & Teams
- Input Ideas To NETL
- Express Your Perspective Directly To Policy Makers and Regulators
- Reject PR As A Substitute For Results

# Thank You

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