

## Membrane Technology Workshop – July 24, 2012

### Purpose

This Advanced Manufacturing Office (AMO) workshop will gather input from stakeholders in industry and academia on the current state of the art, and identify emerging applications, barriers and actions to advance membrane technologies. Specifically, AMO wants to learn more about the current state of membranes research, industry trends and emerging applications; identify the barriers to research, development and implementation of membrane technology at commercial scale; and identify actions needed to advance the use of membrane technology for commercial and industrial applications.

Participants will learn about AMO -- our vision, goals, and initiatives and be encouraged to network with other leaders in this technical field. Participants are asked to provide their individual perspective during discussions. Workshop sessions will cover results and progress from previous workshops.

Workshop participants should NOT discuss specific budget formulation activities, procurement-sensitive or proprietary activities including recent solicitations or awardees, promote specific membrane technologies or products, or identify the specific technical solutions to problems that are identified. Participants will NOT be asked to reach consensus on, or prioritize any subjects under discussion.

### Background

Manufacturing converts a wide range of raw materials, components, and parts into finished goods that meet market expectations. The Advanced Manufacturing Office (AMO) partners with industry, small business, universities, and other stakeholders to identify and invest in emerging technologies with the potential to create high-quality domestic manufacturing jobs and enhance the global competitiveness of the United States.

AMO has a number of Advanced Manufacturing initiatives, such as the Innovative Manufacturing Initiative and Manufacturing Demonstration Facilities (MDFs): <http://www1.eere.energy.gov/manufacturing/rd/index.html>

Some past Membrane and Separation technology workshop reports can be found online:

<http://www.chemicalvision2020.org/pdfs/sepmap.pdf>

[http://www.chemicalvision2020.org/pdfs/h2\\_report.pdf](http://www.chemicalvision2020.org/pdfs/h2_report.pdf)

[http://www1.eere.energy.gov/manufacturing/industries\\_technologies/chemicals/pdfs/feedstock\\_workshop\\_report.pdf](http://www1.eere.energy.gov/manufacturing/industries_technologies/chemicals/pdfs/feedstock_workshop_report.pdf)

[http://www1.eere.energy.gov/manufacturing/industries\\_technologies/chemicals/pdfs/hybrid\\_separation.pdf](http://www1.eere.energy.gov/manufacturing/industries_technologies/chemicals/pdfs/hybrid_separation.pdf)

### Breakout Discussion Ground Rules

- No Speeches
- Listen to Each Other
- Suspend Judgment
- Challenge Ideas, not People

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### Agenda

8:00am-9:00am	Registration and Breakfast	
9:00am-9:15am	Welcome and Introductory Remarks	Dr. Robert Gemmer, AMO
9:15am-9:30am	Review of Historical Membrane Workshop Results	Dr. Sharon Robinson, ORNL
9:30am-11:00am	Where are we today? <i>Industry and Academic Perspectives</i> <i>10-minute overview presentations, followed by 10 minutes of Q&amp;A</i>	Expert Panel Facilitated by Dr. Gemmer
	Mr. Shawn Feist - The Dow Chemical Company	
	Dr. Zissis Dardas - United Technologies Research Center	
	Mr. Charles Page - Air Products	
	Mr. Shekar Balagopal - Ceramatec	
	Dr. Jun Liu - Pacific Northwest National Laboratory	
	Dr. William Koros - Georgia Institute of Technology	
11:00am-11:15am	Break	
11:15am-12:00pm	Breakout Session: Past Successes Facilitated by Lee-Ann Tracy and Marci DuPraw, SRA International	Two concurrent sessions
	<ul style="list-style-type: none"> <li>▪ Review facilitation ground rules and identify 2 reporters for each group.</li> <li>▪ What have been the successes in membrane technology?</li> <li>▪ What are characteristics of successes or “lessons learned”?</li> </ul>	
12:00pm-12:45pm	Lunch and Networking Session	
12:45pm-1:30pm	Breakout Session: Emerging Opportunities	Two concurrent sessions
	<ul style="list-style-type: none"> <li>▪ What are high value current and emerging applications for membranes?</li> <li>▪ List the opportunities. <i>Characteristics to consider: energy savings potential, process intensification, contribution to US competitiveness, broad applicability, ability to perform a difficult separation, etc.</i></li> </ul>	
1:30pm-2:30pm	Breakout Session: Barriers	Two concurrent sessions
	<ul style="list-style-type: none"> <li>▪ What are the barriers to application and increased adoption of membranes for the opportunities identified?</li> <li>▪ List the barriers. <i>Types of barriers to consider: Materials characteristics (selectivity, flux, durability), manufacturing challenges, field testing, modeling or analytical capabilities, etc.</i></li> </ul>	
2:30pm-2:45pm	Break	
2:45pm-3:45pm	Breakout Session: Actions	Two concurrent sessions
	<ul style="list-style-type: none"> <li>▪ What are the actions to overcome the barriers identified?</li> <li>▪ List the actions.</li> </ul>	
3:45pm-4:00pm	Break	
4:00pm-4:30pm	Breakout Session Reports & Closing Remarks	Rapporteurs and Dr. Gemmer
4:30pm	Adjourn	