PORIFERA
CARBON NANOTUBE MEMBRANES
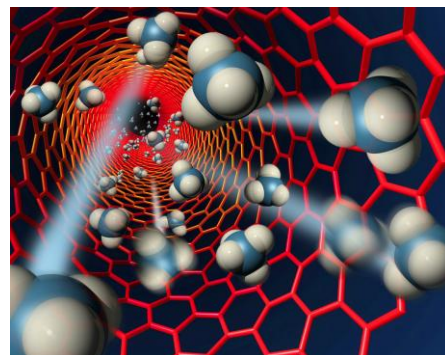
PROJECT TITLE:	Carbon Nanotube Membranes for Energy-Efficient Carbon Sequestration		
ORGANIZATION:	Porifera, Inc.	LOCATION:	Hayward, CA
PROGRAM:	FOA1	ARPA-E AWARD:	$1,153,975
TECH TOPIC:	Carbon Capture	PROJECT TERM:	3/1/10 – 2/29/12
WEBSITE:	www.poriferanano.com		

CRITICAL NEED

Coal-fired power plants provide nearly 50% of all electricity in the U.S. While coal is a cheap and abundant natural resource, its continued use contributes to rising carbon dioxide (CO_2) levels in the atmosphere. Capturing and storing this CO_2 would reduce atmospheric greenhouse gas levels while allowing power plants to continue using inexpensive coal. Carbon capture and storage represents a significant cost to power plants that must retrofit their existing facilities to accommodate new technologies. Reducing these costs is the primary objective of ARPA-E's carbon capture program.

PROJECT INNOVATION + ADVANTAGES

Porifera is developing carbon nanotube membranes that allow more efficient removal of CO_2 from coal plant exhaust. Most of today's carbon capture methods use chemical solvents, but capture methods that use membranes to draw CO_2 out of exhaust gas are potentially more efficient and cost effective. Traditionally, membranes are limited by the rate at which they allow gas to flow through them and the amount of CO_2 they can attract from the gas. Smooth support pores and the unique structure of Porifera's carbon nanotube membranes allows them to be more permeable than other polymeric membranes, yet still selective enough for CO_2 removal. This approach could overcome the barriers facing membrane-based approaches for capturing CO_2 from coal plant exhausts.

IMPACT

If successful, Porifera's project would position membrane-based carbon capture ahead of chemical absorption techniques and enable significant reductions in greenhouse gas emissions from coal-fired power plants.

- SECURITY: Enabling continued use of domestic coal for electricity generation will preserve the stability of the electric grid.
- ENVIRONMENT: Carbon capture technology could prevent more than 800 million tons of CO_2 from being emitted into the atmosphere each year.
- ECONOMY: Improving the cost-effectiveness of carbon capture methods will minimize added costs to homeowners and businesses using electricity generated by coal-fired power plants for the foreseeable future.
- JOBS: Retrofitting coal-fired power plants to capture and store carbon dioxide could create jobs in the U.S. manufacturing, construction, and engineering sectors.

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