

ADVANCED MANUFACTURING FOR AFFORDABLE CARBON CAPTURE

3D printing to produce rapid prototypes with the potential to capture CO₂ more efficiently and economically

IMPROVING PERFORMANCE THROUGH ADDITIVE MANUFACTURING



Triply periodic minimal surface structure, 3D-printed at LLNL

Additive manufacturing, utilizing 3D printing, enables the development of carbon capture devices that **intensify thermodynamic operations, improve process performance, and reduce equipment size**, lowering capital and operating costs.

QUICK FACTS

AWARD NUMBERS

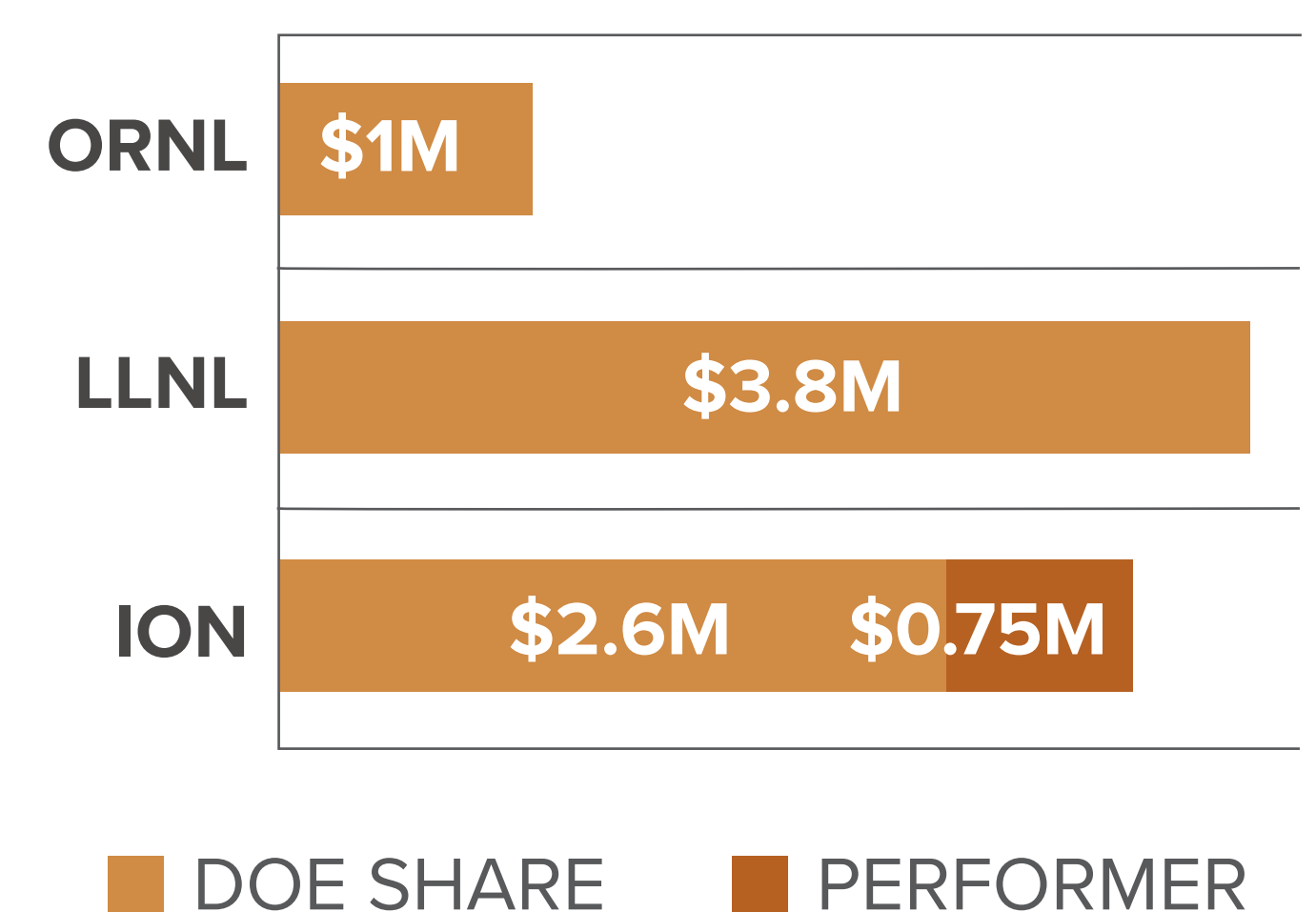
FWP-FEAA130 (ORNL)

FWP-FEW0225 (LLNL)

DE-FE0031530 (ION)

PROJECT BUDGET

FY18 FUNDING



DEVELOPING TRANSFORMATIONAL MATERIALS



Oak Ridge National Laboratory (ORNL) is using additive manufacturing to produce intensified devices that combine multiple thermodynamic operations, improving solvent-based technologies that capture CO₂ from coal-fired flue gas.



Lawrence Livermore National Laboratory (LLNL) is designing and fabricating high-efficiency reactors using novel geometries that support advanced solvents for transformational carbon capture.



ION Engineering (ION) is developing a 3D-printed absorber with integrated packing and internal cooling capabilities to help optimize solvent-based capture.

CONTACTS

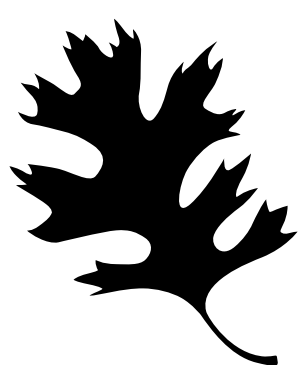
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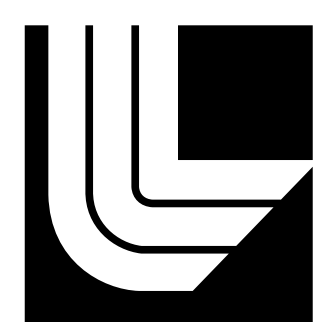
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REDUCING THE COST OF CARBON CAPTURE



ORNL Prints Intensified Device for CO₂ Capture

ORNL 3D printed an aluminum version of a column packing structure with built-in heat exchange.



LLNL Develops High Resolution Techniques

LLNL created silicon-based gyroid structures with one micrometer resolution using stereo-lithography.



ION Prints Absorbers for CO₂ Capture Testing

ION 3D printed two absorbers on plastic for initial testing and plans to print metal absorbers in early FY19.



Packing with different cell densities, 3D printed at ORNL

