

“Distributed Electric Power from Bio-based and Fossil Fuels”

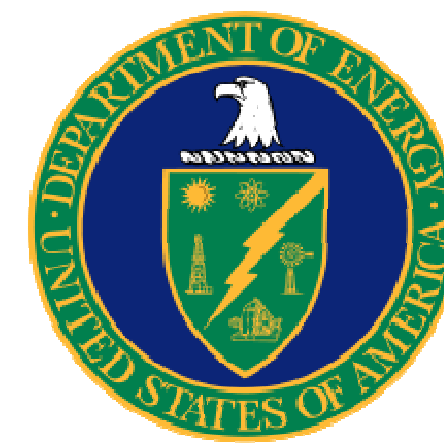
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Project Goal

Engineer & demonstrate TMI's 1 kW systems for 30-90 days on liquid biofuel, including “on the fly” transitions from biofuels to a more traditional fossil fuel and then back again at a test site.

Outcome

Positive economic & technical metrics which can establish early market demands for the system & feedback for TMI product developers.

TASK 1 – Project Management, Planning & Reporting

- **Kick Off Presentation to DOE / NETL**
- **Completed Peer Review**

TASK 2 – Site Selection

- Survey, Rank Ordered, Select Demonstration Site
 - Goal:
 - <60 miles from TMI in Ohio Congressional District 14
 - Project is CDP through Rep. LaTourette
 - Willing end-user with agricultural production preference
 - Acceptable Security & Local Cooperation
- **Completed Site Selection and Final Review**

TASK 3 – System Design and Fabrication

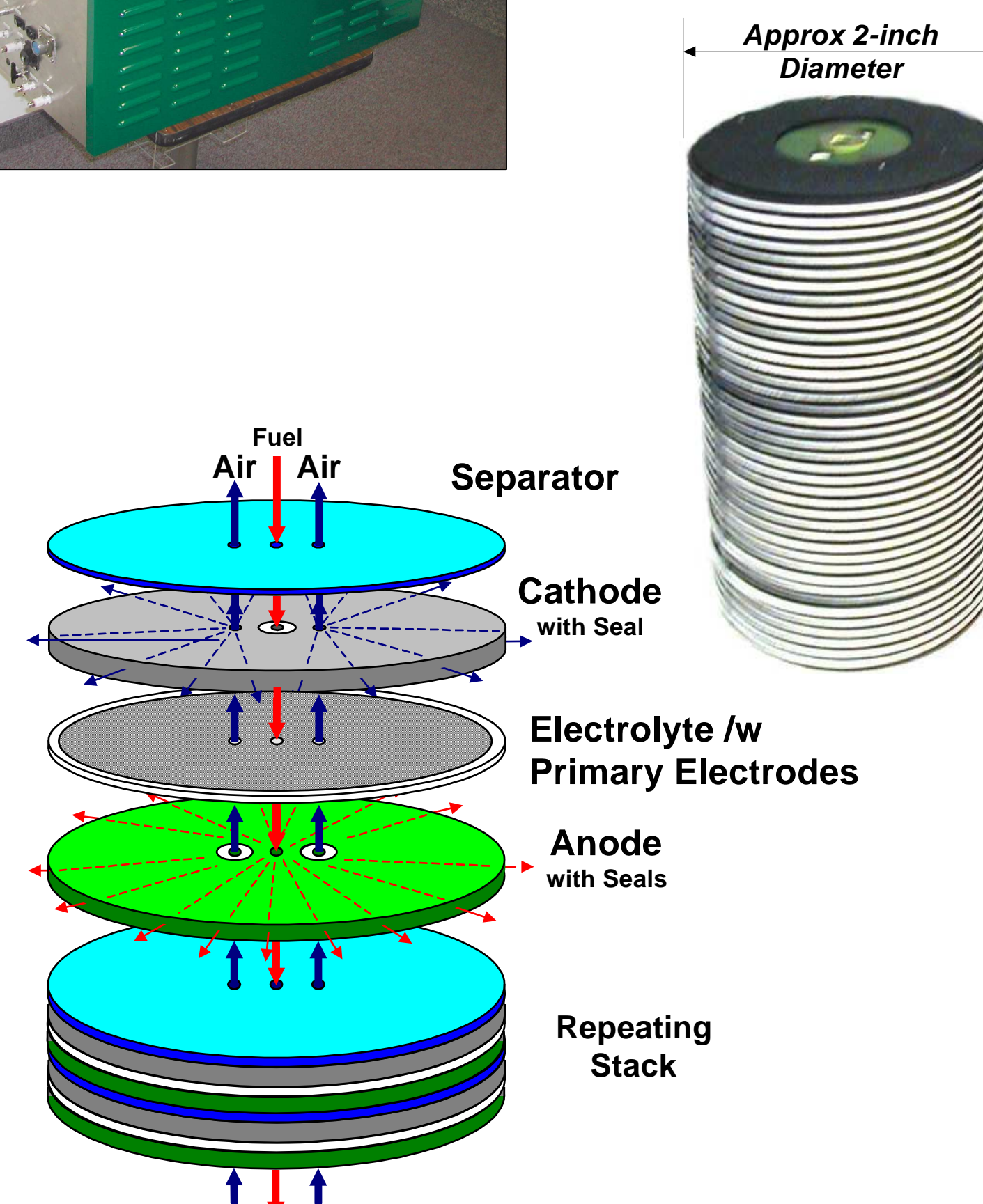
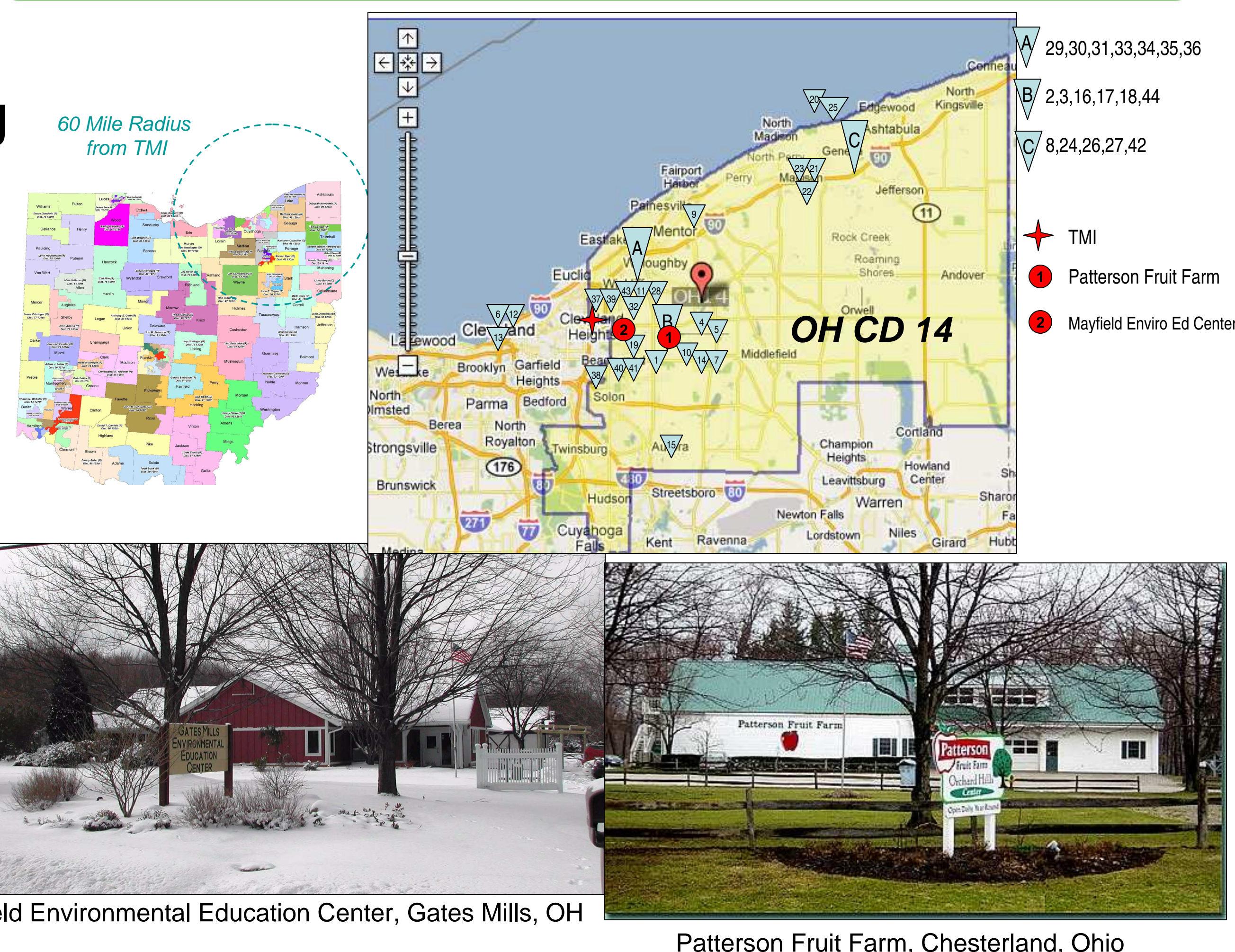
- Design/Build/Test Two (2) 1-kW Complete Systems
 - Based on latest TMI designs
 - Operation on both fossil & bio fuels
 - Baseline testing to determine range of performance
- **System Design Completed**
- **Balance of Plant Fabrication Completed,**
- **Hot Subassembly Fabrication - Delayed due to fabricator welding issues**

TASK 4 – Stack Fabrication

- Cell Component & Stack Fabrication for Pre-Testing & Demo
- **Approximately 50% of Stacks Completed**

TASK 5 – Demonstration

- Site Prep/Installation/Testing/Decommissioning
 - 30 to 90 day test under End User loads
 - Remote monitoring of performance over time
- **System Installed / Test Initiated (Expected Completion 11/11)**



System Development Background

- Preliminary Tests on JP-8:

Peak Gross Efficiency	35.6%LHV
Peak Net Efficiency	29.8%LHV
Peak Gross Power	1215 Watts
Peak Net Power	1019 Watts

- Developed specifically for Lockheed Martin for operation on JP-8 & diesel fuel
- Transported to Lockheed- Akron from TMI while operating on JP-8 without change in performance
- First off-site operation of TMI SOFC System on JP-8

- Originally developed for operation on biodiesel & vegetable oil (USDA/DOE, Ohio Soybean Council)
- Demonstrated 30 days operation on soybean oil at farm in Wakeman, Ohio (2009)
- Tested on JP-8 fuel:

Peak Gross Efficiency	34.3%LHV
Peak Net Efficiency	28.1%LHV
Peak Gross Power	1071 Watts
Peak Net Power	822 Watts

