Renewable Energy Markets

Jon Powers | October 19, 2015
The Bloom Energy Server: 21st Century Solution

All-Electric Solution

Natural Gas or Biogas

AC Power

DC Power

Low/No CO₂
No NOₓ or SOₓ

Mission Critical reliability

Resiliency to threats

Strategic and Targeted placement

Cost-effective and predictable
Bloom Energy’s Growing Customer Base
How It Works

Convert fuel directly into electricity…without combustion

**Conventional Electrical Generator**

- **Natural Gas** (Chemical Energy)
- **Combustion** (Thermal Energy)
- **Turbine** (Mechanical Energy)
- **Alternator** (Electrical Energy)

**Bloom’s Fuel Cell**

- **Natural Gas** (Chemical Energy)
- **Electrochemical Reaction** (Electrical Energy)

Efficient = More Electricity

Bloom offers up to **60%+ electrical efficiency**, the highest commercially available.
Scalable, Flexible, Modular

Fuel Cell
25 W

Stack
1 kW

Module
40-50 kW

System
200 - 250 kW

Solution
200 kW to MWs
Bloom Energy Server Architecture

AC Power to Grid

Fuel

380V DC Bus

6 Sets of Fuel Cells (independent power plants)
Natural Gas is the backbone for our DG everywhere:
- 2.3 million miles of pipeline nationwide
- Highly reliable underground delivery system
- Abundant supply, and readily available
- Made in the USA
- Most economical fuel source

Every Bloom MW uses ~1,200,000 MMBtu over a 20 year project life
Attributes of Bloom Platform

1. Simple, Modular Building Blocks For “Pay as You Grow” Scalable Solutions

2. Reliable, Constant Electrical Output 24x7x365

3. Solid State & Redundant Design Resilient to External Events

4. Reduced/Zero CO₂ No NOx/SOx

5. Low Resource Demands Requires Virtually No Water

6. Cost Control and Predictability for Up to 20 Years

7. Local Fuel Flexibility Natural Gas, Biogas, LNG

8. Time to Power

The Bloom Energy Server

[Images of Bloom Energy Server components and icons for various attributes]
DG Configurations Leveraging Nat Gas Infrastructure

**Bolster Reliability, Enhance T&D**

- No gas or electric disruption through Hurricane Sandy
  - “The Bloom Energy electrical project in New Castle was unaffected by Hurricane Sandy.”
  - Gary Stockbridge
  - Delmarva President

**Mission Critical Customers**

- Mission Critical Power at PayPal Data Center
  - “It is really throwing out the way people have done it in the past. You can build a better mousetrap.”
  - Dean Nelson
  - eBay Vice President of Global Foundation Services

**Microgrids**

- Powering Critical Facilities in the City of Hartford
  - “We know from first-hand experience that we must make our energy grid stronger, smarter, and more secure.”
  - Dannel P. Malloy
  - Governor of Connecticut

---

“We know from first-hand experience that we must make our energy grid stronger, smarter, and more secure.”

Dannel P. Malloy
Governor of Connecticut