

Introducing Bloom Energy

Energy and National Security Program
Center for Strategic and International Studies

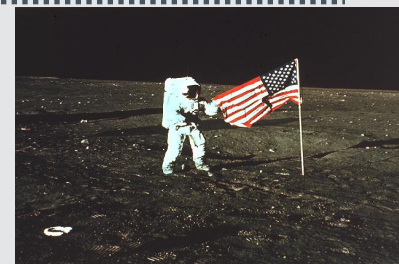
May, 2010

About Bloom Energy

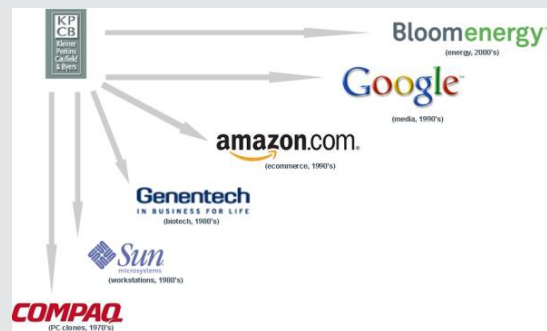


Mission: “To make clean, reliable energy **affordable** for everyone in the world.”

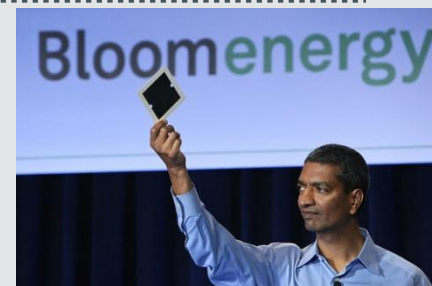
Solid oxide fuel cell
technology first developed for
NASA



Kleiner Perkins’ first
cleantech investment in 2002



Official company **launch** in
February, 2010



Energy Problem: Centralized Generation

Power Generation



- Capital Intensive
- Large CO₂ Footprint
- “Not in my backyard”
- Conversion Loss ~60-70%

Transmission



- Aging Infrastructure
- Capacity Constrained
- “Run to Fail”
- Transmission Loss ~10-40%



Susceptible to Cyber and Physical Attack

Energy Solution: Distributed Generation

Computing



Telephony



Energy



Bloom Fuel Cell Technology

Powder to Power™



***Bloom Energy's
Solid Oxide Fuel Cells***

vs Legacy Fuel Cells

Materials



Low Cost

Temperature



High Efficiency
Fuel Flexibility

Reversibility



Generation
and Storage

Bloomenergy™

Vision: Home Energy Server™

Vision for the Future: Bloom Energy's Home Energy Server™

Bloom's Energy Server is a flexible energy platform capable of clean, reliable, affordable energy generation and storage, and providing a personal "gas station" for tomorrow's hybrid, electric, or hydrogen vehicles.

1 Solar Power

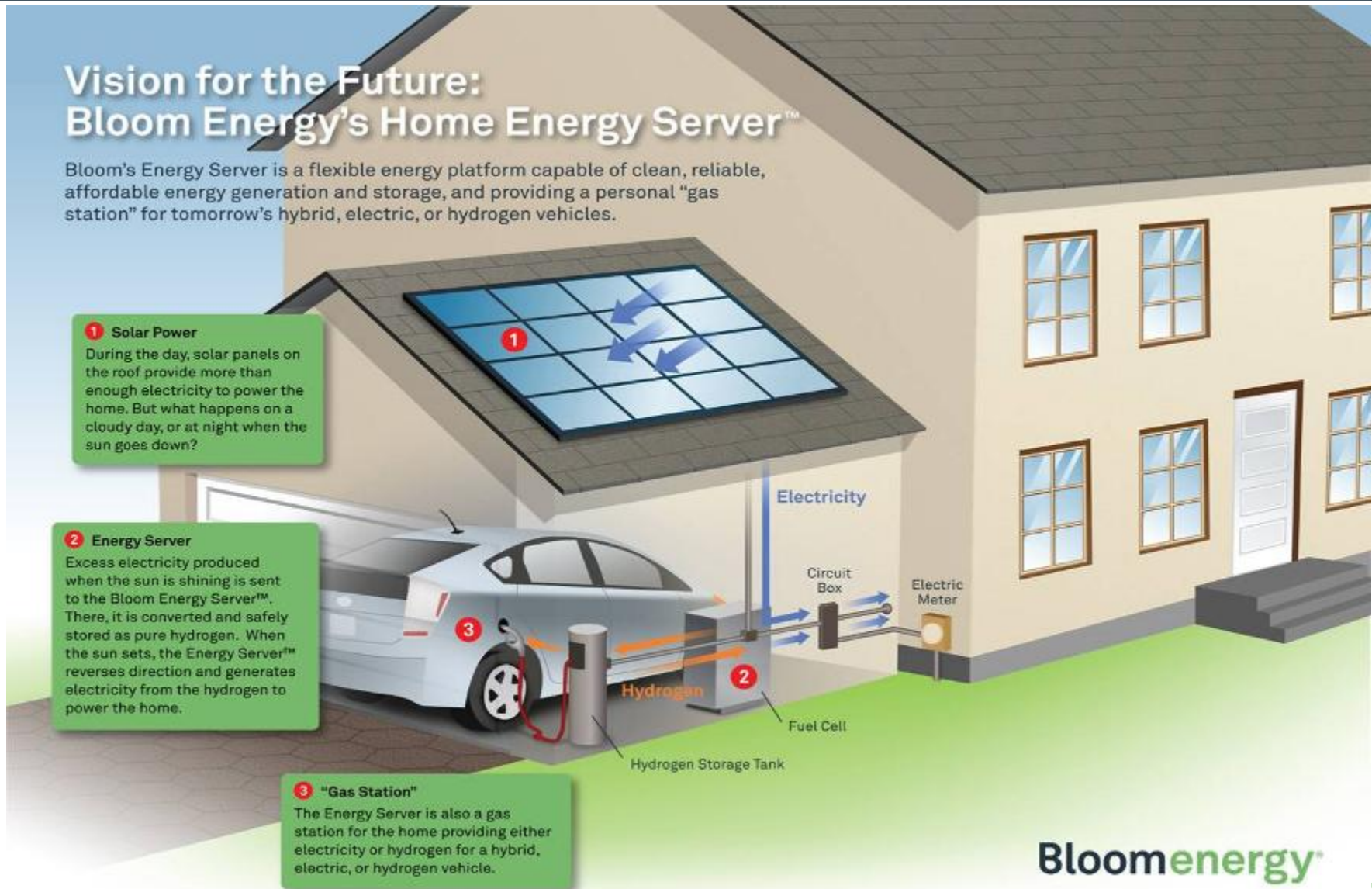
During the day, solar panels on the roof provide more than enough electricity to power the home. But what happens on a cloudy day, or at night when the sun goes down?

2 Energy Server

Excess electricity produced when the sun is shining is sent to the Bloom Energy Server™. There, it is converted and safely stored as pure hydrogen. When the sun sets, the Energy Server™ reverses direction and generates electricity from the hydrogen to power the home.

3 "Gas Station"

The Energy Server is also a gas station for the home providing either electricity or hydrogen for a hybrid, electric, or hydrogen vehicle.



Bloomenergy

Sample Customers



America's Energy Policy



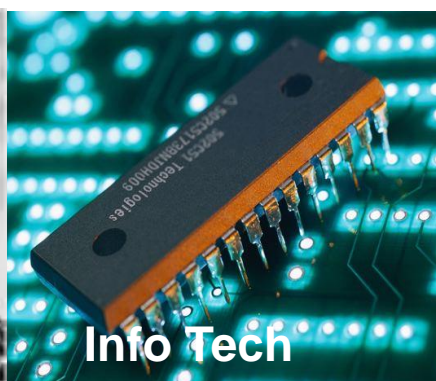
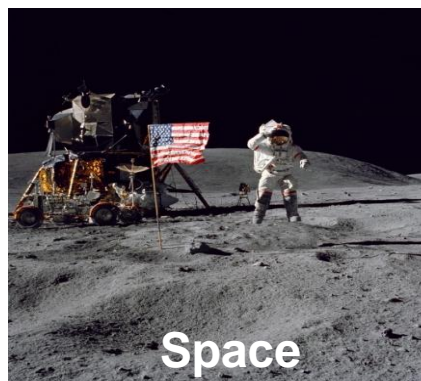
Environmental and National Security Implications



Today's Focus: America's Role as a Global Leader

American Leadership

??? (TBD)



Cleantech represents the **greatest economic opportunity** of the 21st century

America can not assume it will be the cleantech leader

- Where will the clean energy jobs and technologies be created?
- Will America be an importer or exporter?
- **America needs to LEAD**, not follow, when it comes to cleantech

Global Race

- 2009: \$162 billion in new cleantech investments worldwide
 - China invested \$35 billion
 - America invested \$19 billion
- In 1999, 1% of world's solar panels produced in China; by 2008 China had 32% market share
- Only 4 of the top 30 renewable energy manufacturers are based in the United States
- Less than half of the 8,500 GW of wind turbines used in the US last year were made in the United States

What Should We Do?

- 1) Lead by Example
- 2) Increase Domestic Demand and Production
 - Not just RPS/RES or FIT
 - Supporting Domestic Manufacturing is Critical
- 3) Provide Access to Growth Capital for Promising New Clean Energy Technologies



Consume: Government as a Customer

- The Federal Government is the largest consumer of energy in the US
 - ~1 Quadrillion BTUs consumed
 - Over \$200B spent.
- Power of the single largest customer to shape a market
 - **Consume** alternative energy
 - Set quotas for government consumption
 - Performance-based criteria
 - **Educate** and inspire the public
 - Technology **Neutrality**



Focus on US Jobs

- Will we be a leading consumer
- Or Will the US ALSO be a leading cleantech producer?

Consumer Jobs

- Installation
- Service
- Sales

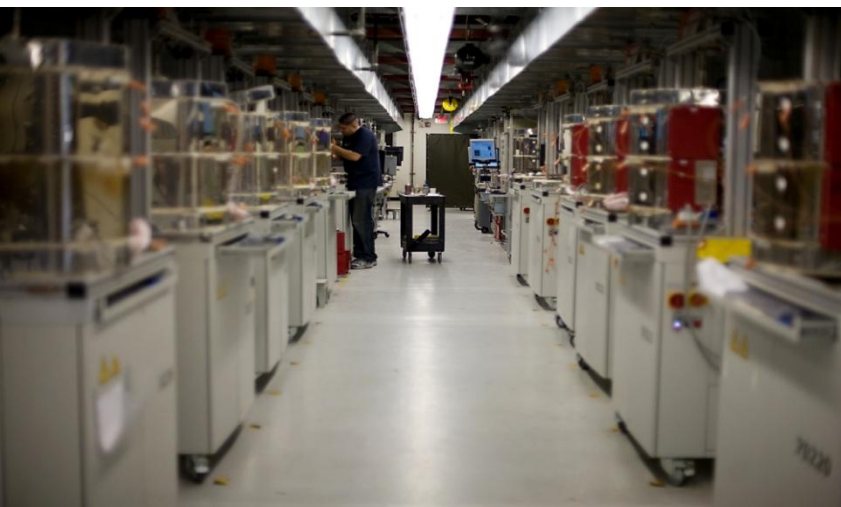
Producer Jobs

- Electrical Engineers
- Software Engineers
- Civil Engineers
- Mechanical Engineers
- Testing Engineers
- Chemists
- Machinists
- Sheet metal workers
- Welders and Solderers
- Marketing Managers
- Product Managers
- Project Managers
- Accountants
- Human Resources
- Executive Assistants
- Stock Clerks
- Customer Service
- Reps
- Installation
- Service
- Sales



Uncertainty about Manufacturing Support in US

- Section 48(C) Manufacturing Tax Credit 3x oversubscribed
- Lack of extension despite administration's and Congress' stated support
- Lack of transparency into selection process



Increase Access to Capital

- Decisive Action by China Development Bank:
 - \$7.3 billion to Suntech Power Holdings
 - \$4.4 billion to Trina Solar
- DOE Loan Guarantee Program:
 - Established in EPCA 2005 to "employ new or significantly improved technologies...that avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases."



The US can be the Global Cleantech Leader

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Bloomenergy™

Be sustainable independent relevant

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