



EFFICIENCY CITIES NETWORK

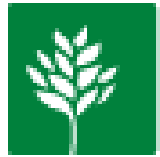
Cleantech Redefined

Tuesday, December 3, 2013
3pm Eastern

Moderators:

Joel Rogers, Center on Wisconsin Strategy (COWS)

James Irwin, Center on Wisconsin Strategy (COWS)



AS YOU SOW

Agenda

- Welcome
- Introduction to me & my organization
- Cleantech Paper
- Cleantech in Cities Applications

Cleantech Redefined

Why the next wave of cleantech infrastructure, technology and services will thrive in the twenty first century

Dallas Kachan & Danielle Fugere
October 2013

www.kachan.com
www.asyousow.org
www.endowmentethics.org



Cleantech is an umbrella investment theme for a wide range of technologies and services.

Cleantech is now everywhere, and poised for even more rapid expansion.

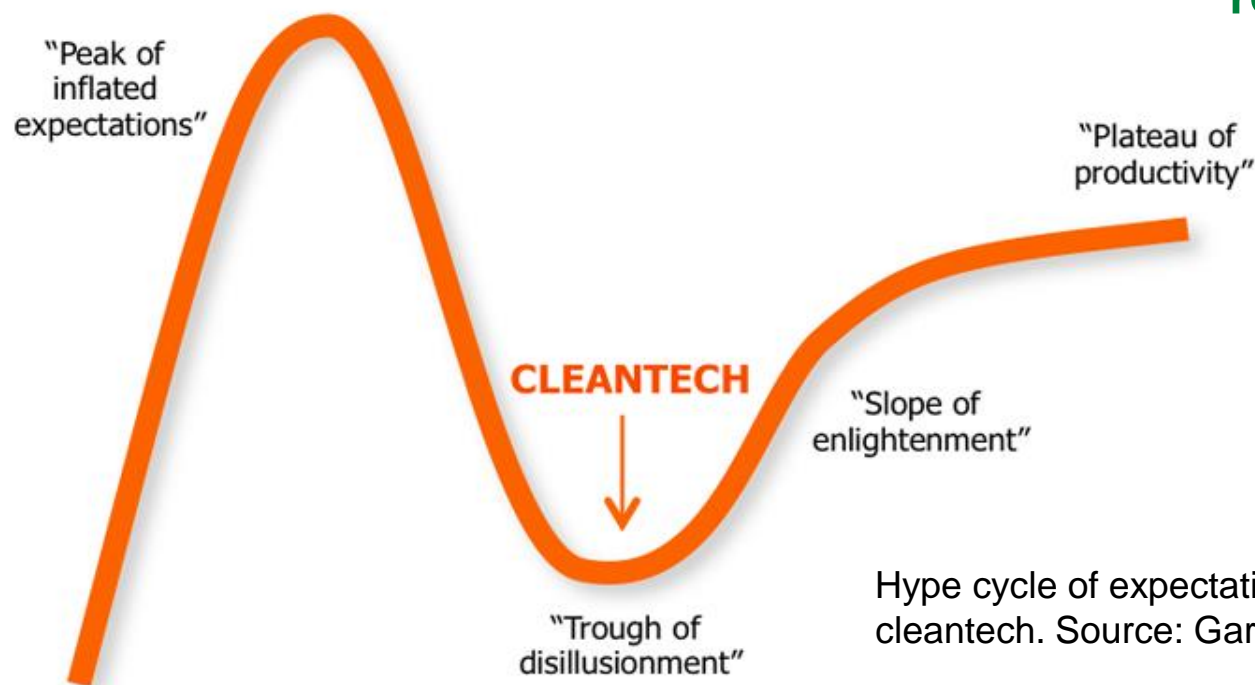
The Cleantech Story

- **Redefining cleantech**
- **Cleantech's many drivers**
 - **Increased resource scarcity**
 - **Climate change**
 - **Changing policy and regulatory requirements**
 - **Risk mitigation**
 - **Many more**

To achieve our economic and environmental objectives, capital needs to be allocated toward products and services that can do and provide more with less.

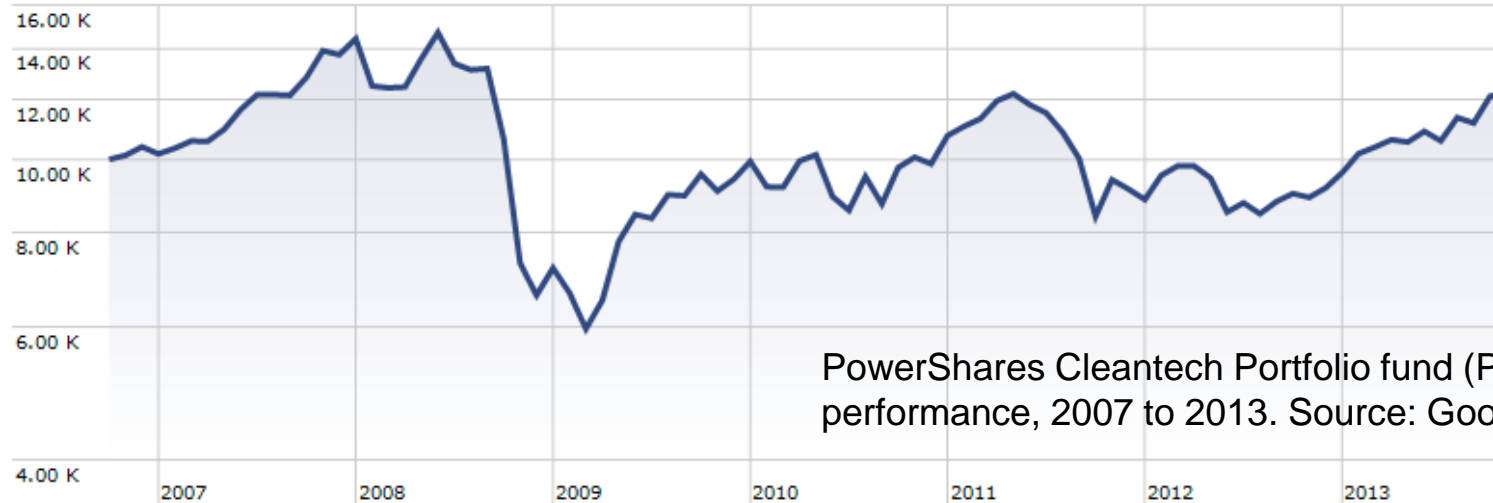
Cleantech's growth mimics the dot com curve

Clean technology has had 10 years of mostly underwhelming returns. Yet there have been bright spots. And a broad recovery seems to be underway.



Hype cycle of expectations over time related to cleantech. Source: Gartner

PowerShares Cleantech:12,236.89

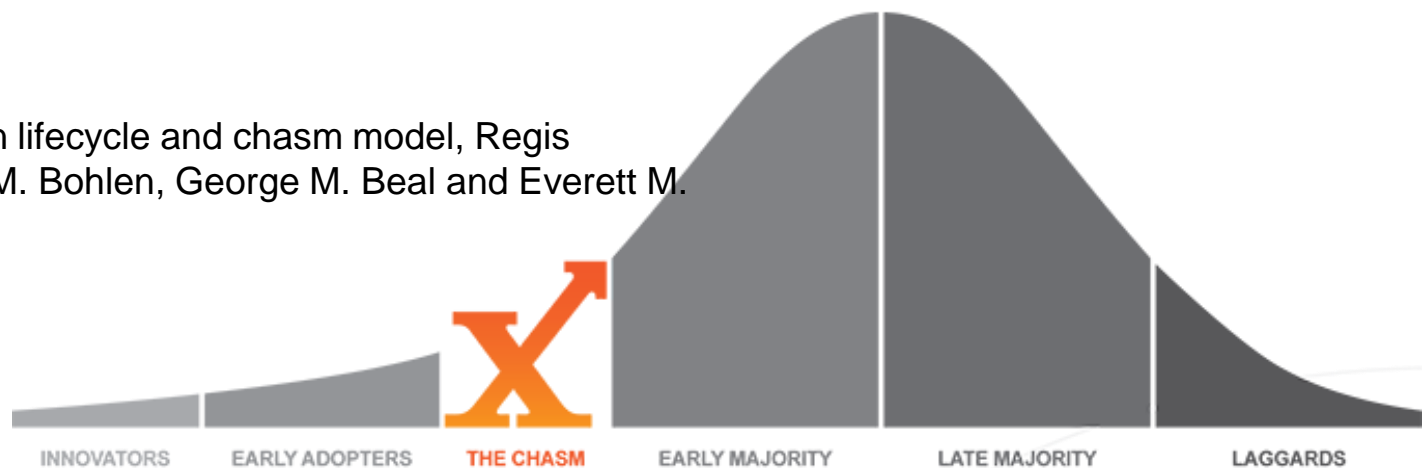


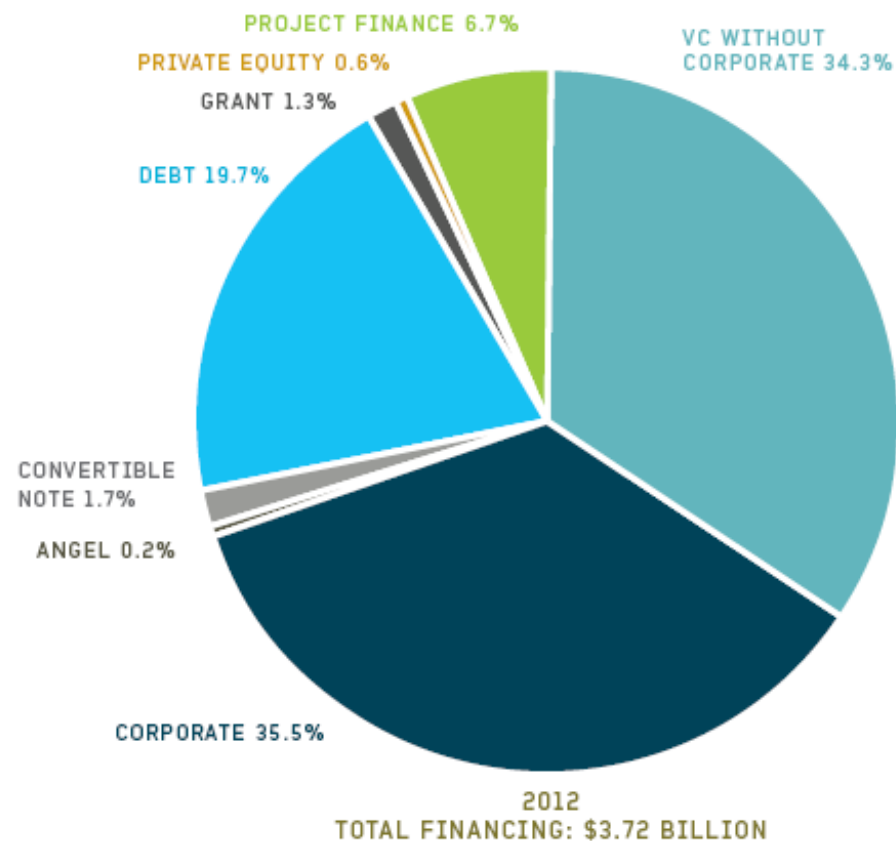
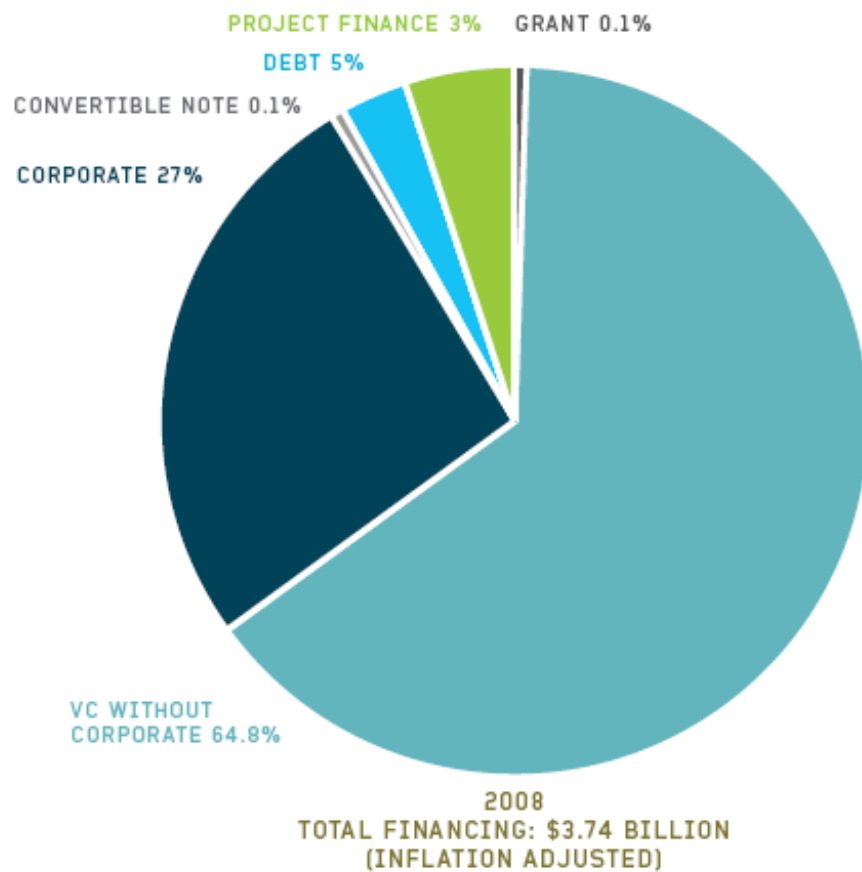
PowerShares Cleantech Portfolio fund (PZD)
performance, 2007 to 2013. Source: Google Finance

Recovering from overhyped expectations and poor returns

Transitioning to the mass market

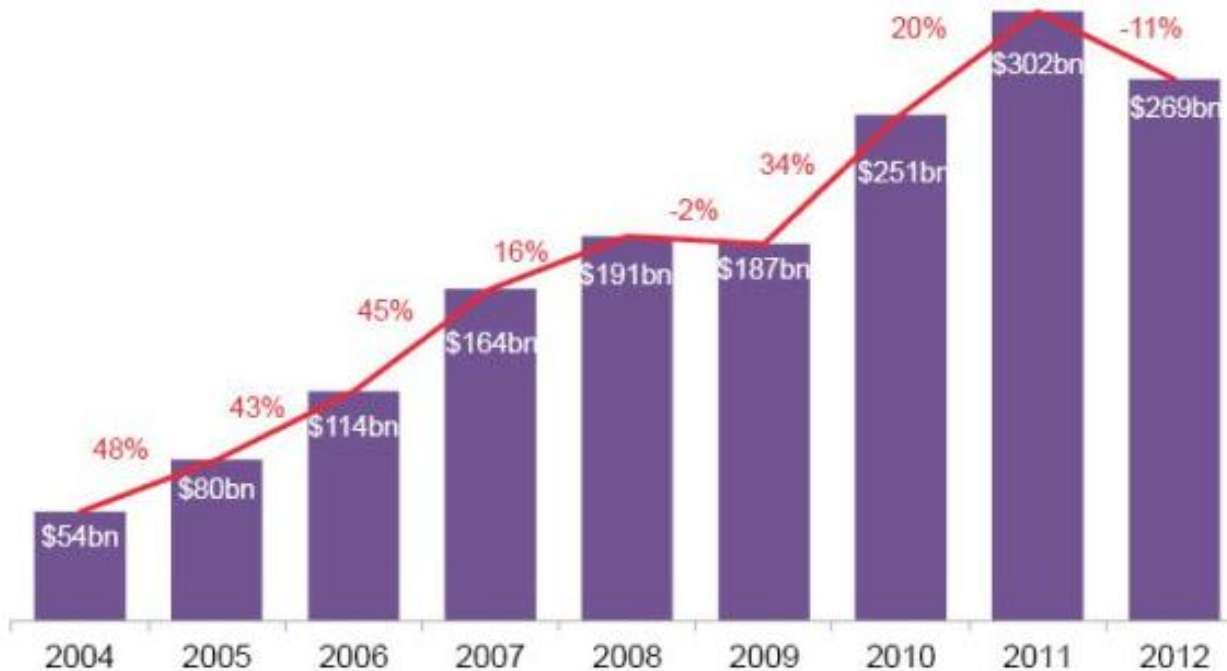
The technology adoption lifecycle and chasm model, Regis McKenna. Source: Joe M. Bohlen, George M. Beal and Everett M. Rogers





Sources of clean technology financing in California, 2008-2012. Source: CB Insights Analysis, Collaborative Economics

Moving beyond the venture capital bubble



Global total investments in clean energy (2004 – 2012, \$B).
Source: Bloomberg New Energy Finance

“A shift in the sources of cleantech funding shows that the industry is changing from one that relies on seed stage venture capital to one ready for investment from major corporations.”

-Noel Perry, Next 10 founder and venture capitalist

Investment opportunities



Clean energy

- Wind
- Solar
- Renewable fuels
- Marine
- Biomass
- Geothermal
- Fuel cells
- Emerging
- Measurement & analytics



Efficiency

- Smart grid
- Green building
- Building automation
- LED lighting
- Data centers & devices
- Smart appliances
- Semiconductors
- Collaborative consumption systems
- Infrastructure



Transportation

- Vehicles
- Traffic management
- Fleet management
- Fueling/charging infrastructure
- Vehicle-to-grid
- Battery swapping
- Alternative fuel conversion



Water

- Production
- Treatment
- Transmission
- Efficiency
- Monitoring & compliance



Agriculture

- Crop farming
- Controlled environment agriculture
- Sustainable forestry
- Animal farming
- Aquaculture



Energy storage

- Batteries
- Thermal storage
- Mechanical storage
- Super/ultracapacitors
- Hydrogen storage



Air & environment

- Emissions control
- Bioremediation
- Recycling & waste
- Materials reclamation
- Waste treatment
- Monitoring & compliance
- Sensors, measurement/testing hardware



Clean industry

- Materials innovation
- Design innovation
- Equipment innovation
- Production
- Monitoring & compliance
- Advanced packaging

Eight major groupings of clean technologies. Source: Kachan analysis



Clean energy

“Poster child” of the clean technology theme

Energy storage

Enabling technology for other promising industries



Efficiency

Green construction materials; automation; control systems



Transportation

Growth in the transportation sector is mirrored by growth in clean transportation technologies



Water

Irrigation;
water treatment
and reuse;
desalination



Agriculture

Crop farming; urban agriculture;
sustainable forestry; animal farming;
aquaculture



Air & environment

Policy support will ensure continued markets for industrial emissions control equipment



Clean industry

Continued efficiency improvements; reduced toxicity in industrial equipment and processes; advances in materials science

Making it Happen

- Invest
- Deploy
- Policy & Economic Development

Invest: Increasing Capital to Clean Industry

- Reallocation of existing assets
 - Pension funds.
- New vehicle examples
 - Green bonds.
 - REIT.
 - MLP.
 - Solar securitization.

Deploy

- Capital investments and retrofits with more efficient products in municipally owned property.
 - Economies of scale
- Public-private partnerships.

Policy & Economic Development

- Public support & media.
- Increasing requirements for unsustainable industry.
- Shareholder activism.
- Lobbying state government.
- Incentivizing constituent adoption.
- Incorporating sustainability standards into zoning requirements.
- Facilitating/ fast tracking permits.
- Sustainable preferences in procurement requirements.
- Marketing your area to cleantech firms for locating.
- Tax incentives.

Thank you! Please feel free to
follow up with me at
atimbers@asyousow.org

Cleantech Redefined: Beyond Solar, Wind, and Efficiency

Dan Apfel

Responsible Endowments Coalition

dan@endowmentethics.org

Cities



RESPONSIBLE ENDOWMENTS COALITION



Successes

- 8 Schools
- Over 20 cities
- Religious Orders
- Pension Funds (internationally)
- Foundations

The Importance of Investment

- Jobs
- Long-term sustainability
- Equality
- Protects local environment
- Climate Change
- The economy, stupid

Reinvestment Vehicles

- Pension Funds
- CDFIs
- Municipal Bonds
- Green Revolving Funds
- Cooperatives
- Local Business
- Food & Agriculture

Investment Sources

- Pensions
- Anchor Institutions
 - College endowments
 - Hospitals
 - Other non-profits
- Other City Funds
- Private Investors

Takeaways

- Shift to a sustainable economy is necessary
- Divestment is important, but not enough
- Cities can be innovation labs
- Work with all the investors locally
- Highlight and partner to create options that can work with many different investors

Contact Information for ECN



EFFICIENCY CITIES NETWORK

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Listserv - ecnmembers@efficiencycities.org

Website - www.efficiencycities.org

To Join - www.efficiencycities.org/join-us