



City of San Diego Clean Tech Initiative

**Engineers Without Borders
San Diego State University Chapter
April 28, 2011**



***Building a
Green-collar
Job Base in
San Diego***





San Diego Assets

- Universities (UCSD, SIO, SDSU, USD)
 - Source of innovations
- 60 Research Centers
- Dominant Industry sectors:
 - Biotech, Wireless, Software & Aerospace/Defense
- Strong entrepreneurial community
- Skilled workforce
- Natural assets (sun, wind, ocean)



Environmental Leadership

- ✓ *More than 19 MW of renewable power is produced at city-owned facilities, earning top rankings by the EPA as a Green Power Purchasing Agency.*

POINT LOMA WASTEWATER TREATMENT PLANT:

- 90-foot outfall is a hydroelectric generator that powers the operation.
- The methane gas created as a by-product of waste treatment is captured and sold.





Environmental Leadership

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SOLAR INSTALLATIONS

- 1.1 MW solar installations power Alvarado and Otay Mesa water treatment plants
- 17 other, smaller solar installations at city facilities





Environmental Leadership

Otay Mesa Water Treatment Facility

- 945-kilowatt solar array
- SunEdison.
- Power Purchasing Agreement (PPA)
- San Diego has more power generated by the sun than any other California city



Source: SunEdison



Environmental Leadership

- ✓ *The city saves taxpayers millions of dollars on energy costs each year through policies and practices, including LEED-certified buildings and energy-efficiency retrofits.*



ENERGY EFFICIENCY:

- Ridgehaven office facility was nation's first Energy Star Building
- SD Convention Center retrofit saves 2.7 million kWh annually
- All city facilities have undergone energy-efficiency overhauls
- Mandating that all new City facilities and major renovation projects achieve LEED "Silver" Level Certification





Environmental Leadership

- ✓ *The city is committed to best environmental practices at all its facilities and has led the way on green initiatives.*

MIRAMAR LANDFILL:

- ISO 4001 certification
- Landfill-diversion (recycling) rate of 64%
- Biomass energy production

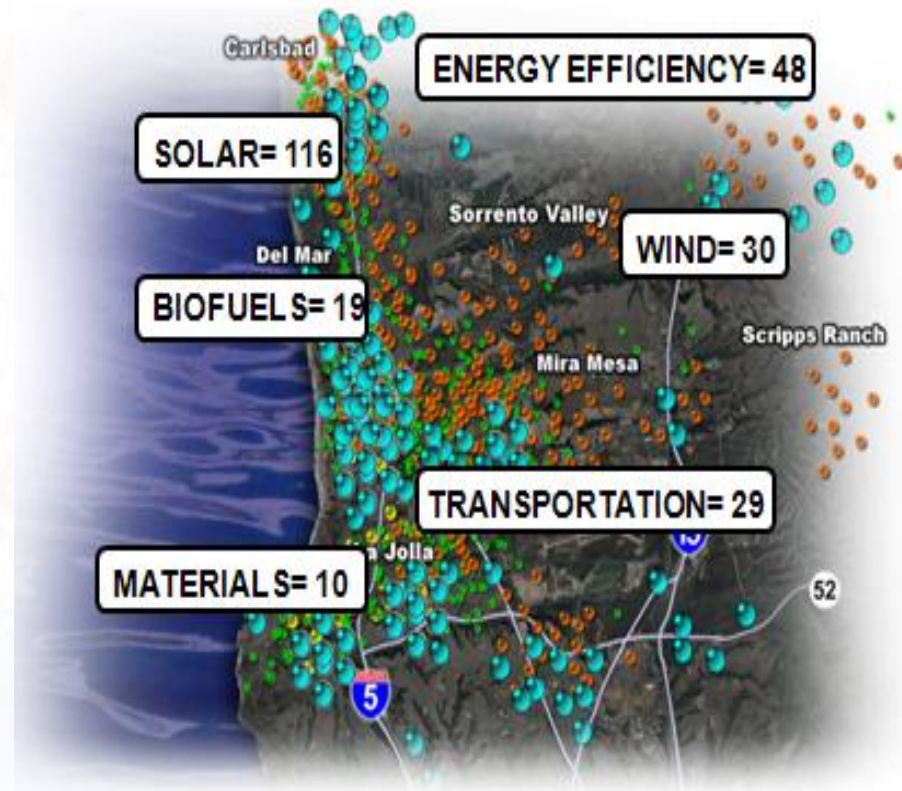




San Diego Clean Tech Cluster

San Diego Clean Tech Initiative (2007)

- Key desired outcomes: job creation, additional revenues and improve environmental quality (reduction of GHG (AB32))
- ~450 Clean Tech companies in San Diego County
- 200+ in the City of San Diego
- Including facilitators (~700+) companies
- Key subsectors: renewable energy, biofuels, transportation, energy efficiency, smart grid and advanced materials





20-Year Vision

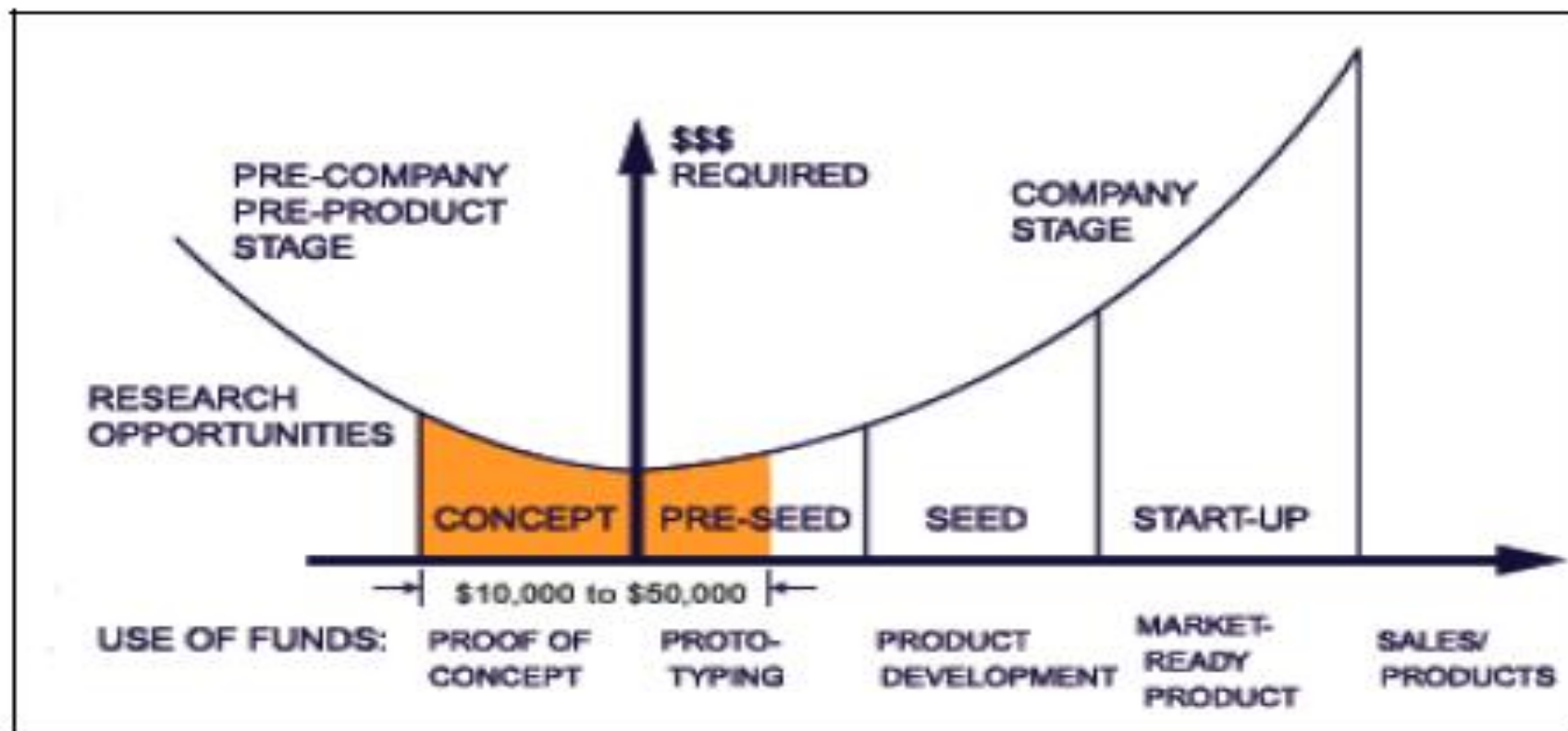
- ✓ **10,000 new cleantech jobs**
- ✓ **300 megawatts of renewable energy**
- ✓ **50 million square feet of green buildings**
- ✓ **10% of homes net-zero-energy**
- ✓ **80% landfill-diversion rate/energy conversion**
- ✓ **100% of public fleet alternatively fueled/zero-emission**
- ✓ **Water consumption down 30%**
- ✓ **Water-supply portfolio expanded to three or more sources**



Cleantech Cluster Development

RESEARCH AND MARKET DEVELOPMENT

- Clean Enterprise Program
- SD CleanTech Innovation Grants Program
- San Diego Zoological Society Biomimicry Partnership
- Cleantech Business Incubator
- Green Workforce Training Program
- Demonstration site(s)





SD Clean Tech Innovation Grants Program

Commercialization of cleantech innovations:

- UCSD William J. von Liebig Center
 - SDSU The Technology Transfer Office
 - Scripps Institute of Oceanography
 - Sustainability Solutions Institute
 - Clean Tech San Diego
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- The process of commercialization of an idea can be complicated and challenging
 - Pre-company development stage have traditionally limited access to financing support due to the inherent risks and uncertainty

"Many great clean energy technologies have been born in our nation's research universities. Accelerating linkages between university research, investors and the business world is essential to moving these ideas to the marketplace," said DOE Secretary Steven Chu.



SD Clean Tech Innovation Grant Program

- Seed funding from the City of San Diego (2008)
- Additional funding from Qualcomm Inc.
 - Two researchers from UCSD and one from SDSU
 - Each awardees received \$50,000 + advisory support for a full year (provided by the UCSD Von Liebig Center)
 - Milestone process
- 2010 SD Clean Tech Innovation Program
 - Sempra Energy Foundation
 - Kauffman Foundation and other regional partners
- Department of Energy (DOE) (three-year - \$1.05 million grant)
 - San Diego Regional Energy Innovation Challenge



ECOtality Project – San Diego

- ECOtality is in the process to deploy 2,550 electric vehicle supply equipment (EVSE) in San Diego County
 - Residential, Commercial and Public EV charging locations
 - San Diego is among the 16 major metropolitan areas included in the EV Project, which will ultimately install more than 15,000 home and commercial charging stations
 - Three-year study to collect data on how the vehicles, batteries and chargers perform in various climates and geographies
 - evaluate the charge infrastructure & revenue systems.



ECOtality's Blink EVSE



NISSAN Corp.



San Diego Biomimicry Hub



**Biomimicry: a new
way of looking at nature**



San Diego Biomimicry Hub

- Biomimicry – **Bios meaning life and mimesis meaning to imitate**
- *Biomimicry is an innovation method that seeks sustainable solutions by emulating nature's time-tested patterns and strategies, e.g., a solar cell inspired by a leaf.*
- Collaborative Partnership with San Diego Zoological Society (SDZS)
 - SDZS is home to more than 4,000 rare and endangered animals
- 2008 - Workshop: Introduction to Biomimicry
- 2009 - Biomimicry Conference (1.5 day)
 - Speakers: Mayor Jerry Sanders and Chip Heath Janine Benyus
- 2011 Biomimicry Conference – Nature, Innovation & The New Economy



San Diego Conference

2011 Biomimicry Conference

Nature, Innovation and the New Economy

April 14-15, 2011

San Diego Zoo Global is pleased to announce the 2011 Biomimicry Conference in San Diego presented by *mirasol*®, a display innovation by Qualcomm. This two-day conference offers the opportunity to consider the solutions nature can offer. Come join leaders in business and innovation to learn about how biomimicry will transform your industry.

Biomimicry has the potential to be a key driver of innovation and an economic game-changer. Products based on nature's principles are poised to be industry leaders in innovation, efficiency and sustainability. As the keeper of the world's largest collection of plants and animals, San Diego Zoo Global continues to develop collaborative efforts with national companies and organizations.

AGENDA

- Keynote speakers on the practical aspects of nature-inspired innovation
- Special animal encounters and tours at the San Diego Zoo
- Interactive workshops on how to incorporate nature's solutions into the design process
- Rapid-fire innovation session featuring new nature-inspired inventions
- Networking receptions

CONFIRMED SPEAKERS

- James Burke, award-winning science historian and host of the BBC series Connections
 - Robert Full, Chancellor's Professor and CiBER Director, UC Berkeley
 - Matt Mason, best-selling author of *The Pirate's Dilemma*
 - David Schenone, Innovation Director for Advanced Concepts at Nike
 - Jane Fulton Suri, Managing Partner and Creative Director at IDEO
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San Diego Biomimicry Hub

- **Biomimetics Examples:**
 - **Natural Ventilation System Termite Mound** (self-cooling designs in the construction of energy-efficient buildings)
 - **Qualcomm Mirasol Screen display** (requires no backlighting and can be viewed in bright sunlight)
 - **Dirt-and Water-Resistant Paint** (Lotus leaf self-cleaning properties)
 - **Biomatrica - Preserve DNA and RNA at room temperature** (Tardigrades ability to preserve itself during long drought periods)



Wikimedia



Wikimedia



Qualcomm Inc.



Wikimedia



Biomatrica



California Clean Innovation (CACI)

- May 5th, 2011 at UCSD – Price Center
- UCSD Rady School of Management and UCLA Anderson School of Management
- Keynote speakers:
 - Mayor Jerry Sanders, City of San Diego
 - John Denniston Partner, Kleiner Perkins Caufield & Byers
- Fast Pitch Business Competition
- Panel Discussions:
 - Making green from Clean: Trends in venture capital, M&A, and IPO activities
 - Bureaucratic Bottlenecks: Permitting, financing, and regulating renewable energy projects in California
 - Turning Trash into Treasure: How can we best utilize trash through waste-to-energy and waste management?



MAYOR JERRY SANDERS, CITY OF SAN DIEGO





Questions?

