



# Diversifying Florida's Economy: Cleantech Cluster

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# Florida's 21<sup>st</sup> C Innovation Economy

Leadership for the 21<sup>st</sup> Century — Diversifying Florida's Economy

**ROADMAP TO FLORIDA'S FUTURE**

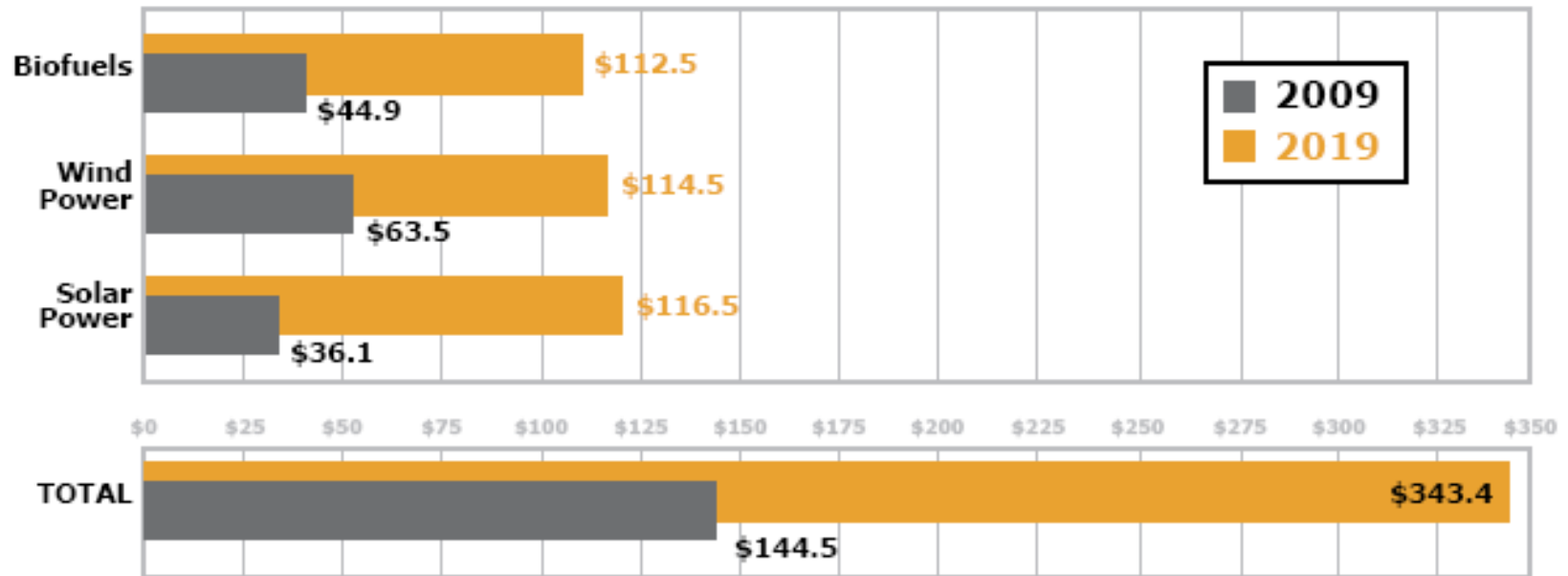
**FLORIDA. INNOVATION HUB OF THE AMERICAS.®**

***CleanTech a targeted cluster strategy for  
diversification and growth***

- Emerging Technology/ Horizon Market Research
- Cleantech innovation infrastructure
- Branding Florida as emerging cleantech hub
- Business development: from recruitment to start-ups; venture capital to workforce
- Global expansion with international commerce

# Large Growth Market

## Global Clean-Energy Projected Growth 2009-2019 (\$US Billions)



Source: Clean Edge, 2010

# Potential for Job Growth

## Global Clean-Energy Jobs (Direct and Indirect): Solar and Wind

	2009 (Current)	2019 (Projected)
Solar Photovoltaics	267,562	2,178,919
Wind Power	563,577	1,122,815
<b>TOTAL SOLAR AND WIND JOBS (Global)</b>	<b>831,139</b>	<b>3,301,734</b>

*Source: Clean Edge, Inc., 2010*

# Increase in VC Investments

## Clean-Energy Venture Capital Investments in U.S.- Based Companies as Percent of Total 2001-2009

Year	Total Venture Investments (US\$ Billions)	Energy Technology Investments (US\$ Millions)	Energy Technology Percentage of Venture Total
2001	\$40.6	\$351	0.9%
2002	\$22.0	\$271	1.2%
2003	\$19.7	\$424	2.2%
2004	\$22.5	\$650	2.9%
2005	\$23.0	\$797	3.5%
2006	\$26.5	\$1,308	4.9%
2007	\$29.4	\$2,867	9.8%
2008	\$28.3	\$3,213	11.4%
2009	\$17.7	\$2,216	12.5%

Source: Bloomberg New Energy Finance with supporting data from Clean Edge and Nth Power, 2010. NOTE: New Energy Finance's energy-tech VC numbers include investment in renewable energy, biofuels, low-carbon technologies, and the carbon markets. VC figures are for development and initial commercialization of technologies, products, and services, and do not include private investments in public equity (PIPE) or expansion capital deals.

# Cleantech Cluster Strategy

FLORIDA is at  
the leading edge of cleantech innovation.

## CLEANTECH TRENDS

### ENERGY

#### Solar



The demand for utility-scale PV systems has picked up dramatically in the U.S. over the past several years.

#### Biofuels



Second generation cellulosic ethanol is soon expected to achieve commercialization. Third generation biofuels are rapidly approaching financial feasibility and are expected to hit the market by 2016.

#### Ocean



Oceans offer an abundant, predictable, and dense source of energy—and are attracting billions of dollars of investment in electric generation capacity.

#### Storage



Energy storage technologies will play an integral role in supporting the deployment of renewable energy technologies. New batteries are needed for a broad range of applications, from vehicles to RFID.

#### Smart Grid



Smart grid is a leading area for U.S. cleantech investment, attracting more than \$400 million in venture capital in 2008 and 2009.

## FLORIDA INNOVATIONS

Florida utilities have been leaders in the deployment of utility-scale PV systems. In fact, Florida Power and Light's 25 MW DeSoto West Generation Solar Energy Center is the largest of its kind in operation.

Attracted by Florida's biomass resources, climate, and leading biofuel researchers, industry leaders Verenium and BP have already broken ground on a commercial scale bioethanol plant in rural Florida. Several Florida companies are also ramping up algal biodiesel production.

Florida's long coastline, proximity to the Gulf Stream, and marine research strengths are supporting a broad range of ocean energy deployment activities, including turbine, wave, and thermal technologies.

Florida companies are involved in all aspects of energy storage and battery technologies—developing and manufacturing everything from hybrid fuel cells to advanced lithium ion batteries.

Florida companies develop and manufacture smart meters, integrated circuits for powerline communication, and smart grid software systems. Florida is also home to some of the nation's largest smart grid demonstration projects.

### EFFICIENCY

#### Advanced Materials



Advanced materials—including nanomaterials, coatings, and bioplastics—will play an important role in reducing the environmental impact of production, transportation, and day to day activities while delivering improved products and lower costs for consumers.

Florida researchers are at the forefront of solid state lighting innovation—recently breaking the world record for OLED efficiency. The state also offers great strength in advanced materials—especially bio and nano materials and ceramics.

#### Green Building



The U.S. green building market for new construction alone is projected to reach up to \$140 billion by 2013.

Florida companies are leading the way in green design, building controls and automation technologies, and green building materials and fixtures.

### ENVIRONMENT

#### Water



Resource constraints, decaying infrastructure, and rising water prices are just a few of the factors driving demand for advanced water technologies across the globe.

Florida companies are at the forefront in advanced filters, separation technologies, and reverse osmosis desalination systems.

#### Air and Environment



Environmental monitoring, air pollution prevention, and bioremediation technologies are an important part of the clean technology industry.

Florida is home to one of the nation's top biotechnology industries, and the state's biotech companies possess particular skills in the development of bioassays, biochips, and bioremediation technologies.



# Cleantech Microsite

eFlorida.com/Cleantech

- Industry Quick Links

- Latest Buzz
- Current News
- Fresh Content
- RSS Feed

- Cluster Videos
- EFI YouTube Channel Feed

- Thought Leadership
- Webinars
- White Papers
- Podcasts

- Florida In Depth
- Cluster Snapshot
- Market Brief

- Cluster Map

- Cleantech Market Brief
- Industry Newsletters
- Expansion Assistance

# Marketing Florida Innovations

- Environmental Remediation
- Biofuels
- Solar
- Energy Storage
- Smart Grid
- Ocean Energy
- *More in future.....*

## Strategic Alliances:



**SmartBrief on Sustainability**  
The Future of Responsible Business is Now



The screenshot shows the Enterprise Florida website's 'CLEANTECH TREND SPOTLIGHT' page. The page is titled 'CLEANTECH TREND SPOTLIGHT' and includes a sub-header '\*My eFlorida registration required'. The main content is organized into several categories, each with a brief description and a list of related resources:

- Environmental Remediation:** As a cleantech mainstay, the environmental monitoring, compliance and remediation sector is strongly represented in Florida. The state's expertise in bioremediation and waste treatment technologies is complemented with emerging capabilities in environmental management software, array biosensors and other related areas.
  - On Your Radar: Environmental Remediation
- Biofuels:** In recent years, the growth in the U.S. biofuels production and consumption has been driven largely by policy measures. Mandates are requiring increasing amounts of biofuels to be blended into the nation's petroleum supply. As a result, significant investments are being made in R&D and the commercialization of advanced biofuels.
  - On Your Radar: Bringing Up Biofuels: The Next Generation
- Solar Energy:** The solar sector is one of the hottest areas in cleantech, with increasing demand, falling PV prices and continuous technological innovations. The US solar market, in particular, is evolving as fast as it is growing.
  - On Your Radar: New Ideas in Solar
  - On Your Radar: Concentrated Solar Thermal Energy
- Energy Storage:** Called "the latest 'Google of Greentech,'" energy storage is emerging as one of the fundamental building blocks of the clean energy economy. Storage can make energy generation, transmission and distribution more cost-efficient and reliable.
  - On Your Radar: Energy Storage
- Smart Grid Technologies:** Smart grid technologies promise to improve power distribution and reduce consumption while connecting to diverse load, storage and generation resources and making the system more efficient, interactive and flexible for both consumers and utilities. Before the projected benefits can be realized, however, key issues have to be resolved.
  - On Your Radar: Smart Grid
- The Ocean: The Next Frontier in Renewable Energy:** Ocean energy could satisfy 10% of the total national demand for electric power, while having a minimum negative impact on the environment. Ocean energy technologies, however, have only recently emerged as an area of significant R&D. A number of such technologies—designed to tap the power of the ocean's waves, temperature differences, currents and tides—are currently under development.
  - On Your Radar: A Wave of Investments in Ocean Technologies
  - On Your Radar: The Next Frontier in Renewable Energy?
  - On Your Radar: Harnessing the Power of the Gulf Stream
- Turning Innovation Into Market Growth:** Several emerging clean energy trends offer great opportunities for small and medium size companies to innovate and grow with the marketplace in this dynamic industry. Learn more in this report from the Cleantech Group and Enterprise Florida.
  - Transforming Innovation into Market Growth\*

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# Some Early Results (2008-10)

- Projects: 18
- Projected Jobs: over 2,000
- Projected Investment: over a billion dollars
- Broad representation:
  - Cellulosic ethanol manufacturing
  - Solar/wind turbine manufacturing
  - Lithium-ion battery manufacturing
  - LED lighting
  - Biofuels production from organic waste
  - trash to renewal fuel
  - algae biofeuls

# www.eflorida.com/cleantech

