

## Cleantech Nation: Cleantech playing a central role in the national recovery agenda

Cleantech industries are poised to benefit as an infrastructure play and job-growth driver in President Barack Obama's push for a new energy economy, boosting opportunities for cleantech investors, producers and adopters.

### Highlights

1. Stimulus plan hopes to fill financing gap in cash-starved, capital-intensive, renewable/alternative energy and smart grid projects—rapid delivery crucial to ease credit squeeze.
2. Venture capital cleantech investment tops \$4 billion in 2008, up 54% over 2007, though cooled in Q4. Solar remains bright spot.
3. Democrats already eyeing second phase of energy legislation before December Copenhagen climate change talks; possible push for national Renewable Portfolio Standard and cap and trade.

### New energy infrastructure build-up to benefit cleantech

#### Government backing

American Recovery and Reinvestment Act fuels \$83 billion into cleantech sectors, and renewable tax incentives were extended.

#### Extended investor visibility

Longer-term energy policy encourages widening the tax-equity investor pool and spurring venture capital, public investment, strategic investment and business combinations.

#### Multiple industry players lead to diversified economic impact

Cleantech investment drives economic and job growth across a spectrum of industries—from IT, automotive, manufacturing and biotech to agriculture.

#### Greenhouse gas, energy supply solutions

Modernized and efficient energy infrastructure dovetails with greenhouse gas reduction goals, and long-term energy supply needs.

# The stimulus package is a clear signal of sustained government support for cleantech—from solar to smart grids—in the short and long term

### A second surge for cleantech

Cleantech industries have grown rapidly in the past several years. Rising oil prices have certainly played a role, but cleantech has been driven largely by government action—including grants, mandates, and tax incentives—to add more renewable electricity and alternative transportation fuels to the nation's energy supply. In 2008, solar installations doubled in the US, and a record 8,300 megawatts of wind capacity was added. Venture capital cleantech investment hit a record-high \$4.1 billion in 2008, up from \$1.4 billion in 2006.

Despite the momentum, the credit squeeze has challenged sectors such as wind and solar, stalling new and expansion projects. The pool of tax equity investors—including investment banks and insurance companies—has diminished. Meanwhile, venture capitalists face a weak exit environment, disrupting traditional liquidity sources and trying the patience of limited partners.

As the recession deepened, Congress passed the Emergency Economic Stabilization Act of 2008 (EESA) containing a \$17-billion energy tax title incentivizing energy efficiency and renewable energy, including an 8-year extension of the 30% commercial and residential solar investment tax credit (ITC), eliminating a cap on residential solar installations and permitting utilities and alternative minimum tax filers to use the credit. The act also extended the ITC for wind electricity for one year and granted or extended credits for other sectors, including biofuels, combined heat and power, geothermal power, building and vehicle efficiency, and alternative (biofuel and electric) fueling stations.

Government, again, is boosting cleantech.

### Obama's turn...

On February 17, 2009, President Obama signed the American Recovery and Reinvestment Bill, placing cleantech as a key driver of economic stabilization and job growth. The \$787-billion bill includes about \$83 billion for cleantech spending and tax plans.

The measures target doubling renewable energy generating capacity—sourced largely by wind, solar and geothermal—over three years, equal to powering six million homes. Provisions also target efficiency, expanded electricity transmission networks, and modernization of electricity grids including advanced metering, energy management software, and usage-monitoring sensors.

### Highlights of the programs include:

#### Efficiency

- \$12 billion: energy efficiency grants and investments for government buildings, HUD dwellings
- \$5 billion: home weatherization

#### Renewable power

- \$6 billion: renewable energy loan guarantees, wind tax credits extended

#### Water technology

- \$7.2 billion: loan guarantees and grants to upgrade water treatment systems

#### Smart grid

- \$11 billion: electricity transmission and smart grid (3,000 miles of transmission lines and 40 million smart meters)

#### Other

- \$21 billion: cleantech tax expenditures (including renewable energy credits)
- \$3.4 billion: carbon capture research
- \$2 billion: vehicle battery loan guarantees and grants for R&D

### Meanwhile... solar drives VC cleantech investment up 54% in 2008

Venture capital (VC) cleantech investment hit \$4.1 billion in all of 2008, up 54% from \$2.7 billion in 2007, though it fell by 14% in the fourth quarter. Solar drew \$1.9 billion in 53 deals compared with \$621.7 million in 42 deals in 2007. The top seven VC investments in 2008 were in cleantech. Other growing sectors are geothermal, pollution and recycling and transportation. (See investment figures, PwC/National Venture Capital Association MoneyTree Report in addendum.)

**"We believe strongly that the value we create for our customers and our investors comes from our ability to deploy emerging technologies—specifically from the clean-technology and energy efficiency areas."**

— James E. Rogers,  
Chairman, President and CEO,  
Duke Energy Corporation  
From CEO interviews in  
PricewaterhouseCoopers  
12th Global CEO Survey

# Cleantech investments meet convergent needs: job growth, greenhouse gas reduction, and energy and fuel efficiency

Immediate and converging needs drive the government's clean energy support: job growth, energy efficiency, renewable energy, alternative fuels and greenhouse gas reduction.

The stimulus package aims to create up to 3.5 million jobs. But the package also signifies a long-term, comprehensive commitment to a national clean energy infrastructure. President Obama's appointments include staunch clean energy advocates such as Steven Chu, secretary of the Energy Department, and Carol Browner as White House "energy czar," and point to sustained policy supporting cleantech. Looking ahead, the National Academy of Sciences will review new energy tax codes and report on their effect on greenhouse gas emissions by October 2010, which could hold important implications for further energy legislation.

## First, easing the credit squeeze

Urgency surrounds numerous cleantech companies, which saw a drying-up of tax-equity-structured financing in 2008 and stalled new and expansion projects in solar, wind and biofuels. Swift disbursement of stimulus plan investment for such project financing—ideally, in the first half of 2009—could help avert a raft of potential bankruptcies or crippling retrenchments through 2009.

## Infrastructure plays

Placing clean energy front and center of the new energy economy will likely spur continued private investment in cleantech, and companies will likely find strategic opportunities as either adopters or investors or both.

Adopters of cleantech solutions will benefit by cutting energy costs, mitigating future carbon costs, and claiming competitive and reputational advantages. Investors in cleantech (VCs, private equity groups, hedge funds, banks) will likely benefit from investing in areas that contribute most seamlessly to the growing new energy infrastructure but which also demonstrate competitive advantages in a carbon-

constrained market. Most beneficiaries of loans and grants will likely be those that offer commercial-ready technologies. Investors that forge strategic alliances and partnerships with innovative clean energy companies will also stand to benefit.

Finally, emerging convergences and alliances—such as automakers/utilities and agriculture/oil companies—will become increasingly crucial to building a new energy infrastructure.

## Extending tax incentives = Investor activity

Sectors granted long-term tax credit extensions in October 2008 also attracted the most VC investment. VC investment in solar nearly doubled, and investment in batteries (fuel cells) rose by about 22%; both solar and fuel cell sectors got 8-year extensions. Geothermal, which drew increased VC investment, likewise received an 8-year ITC extension (and greater leased acreage of federal geothermal property). By comparison, VC investment in wind (with a two-year extension) fell about 40% in 2008.

## Phase two: Harmonizing legislation in 2009?

Investor and adopter involvement will likely increase if standards and mandates harmonize on a federal level, moving away from state-by-state patchwork energy policies and creating a sturdier framework for long-term investment. A federal renewable portfolio standard (RPS) (Obama calls for 10% by 2012; 25% by 2025), a national car emission standard, and further extending tax credits for wind energy and other clean energy technologies would pave a longer investment runway nation-wide.

Phase two could arrive by summer, in advance of December's global climate change talks in Copenhagen. Rep. Henry Waxman (D-CA), chair of the House Energy and Commerce Committee, announced that a cap-and-trade bill could be introduced as early as May. A federal RPS is expected to be part of that energy bill. Together, these measures would ultimately produce a considerable boost to building up and financing a clean energy infrastructure.

**"Investment in wind power provides compound economic, environmental and energy security benefits."**

— Denise Bode, CEO,  
American Wind Energy Association

# The sooner stimulus investment is deployed, the greater the likely impact on cleantech industries

## Q&A

**Q: Which cleantech sectors do you expect the stimulus to impact most?**

Although many cleantech sectors are expected to benefit, it is uncertain how quickly the stimulus will make meaningful impacts. Much of the package targets existing technologies, and this may help some early-stage companies. More significant assistance for later-stage companies could stem from Department of Energy (DOE) grants and loan guarantees, likely focusing on smart grid, renewables and energy efficiency.

**Q: Do you expect a national renewable portfolio standard (RPS) to be passed?**

Passing a renewable portfolio standard will continue to prove difficult, with strong opposition from utilities. Also, the likelihood of near-term energy price increases could be viewed as working against the stimulus' objectives. Another barrier to a nationwide RPS is that some regions of the country are simply better suited to renewable energies than others.

**Q: Do you believe the recession will postpone cap-and-trade legislation in the United States to 2010 or even beyond?**

The environment is high on the agendas of both the Administration and Congress. Rep. Henry Waxman (D-CA) and Sen. Barbara Boxer (D-CA) are both pushing for cap and trade legislation in 2009; however, this is ambitious, given opposition from those concerned about how a carbon cost will impact energy prices and consumers. While it appears passage of a cap-and-trade system is ultimately likely, we expect the

debate could very well push any legislation beyond 2009.

**Q: Which cleantech sectors have been hurt most by the collapse of the debt and equity markets?**

Clearly, companies in sectors with capital-intensive business models. Those looking to raise large expansion rounds of financing and those with long-time horizons to break-even operations will have difficulty raising additional capital, leading them to alternative financing sources like the DOE. One emerging trend is a shift by capital intensive cleantech businesses to a licensing model.

**Q: What trends are expected in 2009?**

Stock market declines, the recession and restricted capital will lower cleantech company valuations in 2009. This may spur M&A activity by well-funded companies with strategic interests in clean technologies. Investors are likely to favor more capital-efficient investments, such as energy efficiency technologies.

**Q: In terms of VC fund raising, what kind of potential investment overhang exists?**

Although VC fundraising dropped significantly in Q4 2008, limited partners still have substantial cash to invest, albeit less than a year ago. Even if 2009 fundraising continues slowly, annual 2009 fundraising may still be on the order of \$20 billion. Capital efficient investments are likely to have better access to this capital; however, there are always opportunities for companies with the next big ideas. With deepening concerns over greenhouse gas emissions, one such area may be carbon capture and storage.

## Contact information

To have a deeper discussion about the implications of the stimulus package on cleantech industries, please contact:

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