Ascent Virginia

CLEANTECH DEVELOPMENTS AROUND THE U.S. AND THE WORLD

In the clean technology field several U.S. states and many countries have already taken steps to become leaders as the energy industry and governments put ever more emphasis on renewable energy. Below is a brief summary of important developments in the United States and the rest of the globe.

States Set Pace for Cleantech Development

Many U.S. states are moving forward aggressively with policies that foster clean technology industries.

California has set a goal of producing 50 percent of its electricity from renewable energy by 2040. The state has already reached 20 percent. California is also brokering electric power sharing arrangements with neighboring states and Canada. And, the state is contemplating gigawatt-level storage investments as well as an expansion of its electric vehicle industry.

In North Carolina, Google, Apple, and Facebook, all of which located energy-intensive data centers in the state, have made ambitious commitments to run them on renewable energy. This in turn has created support for an aggressive renewable portfolio standard (RPS). The Tar Heel State currently ranks second in cumulative installed solar capacity in part due to a booming utility-scale solar industry. Amazon installed the state's first commercial-scale windfarm in 2016 to power its cloud services, generating $1 million annually for the local economy.

New York state's Reforming the Energy Vision program has attracted attention for its lofty green power goals and commitment to clean technology, energy efficiency, and innovative demonstration projects. The state has recently pledged to raise at least an additional $1 billion from the private sector to boost the ability of its green bank to invest in sustainable infrastructure.

The District of Columbia is home to the most robust solar renewable energy credit (SREC) market in the country. That growth has been spurred by an ambitious RPS in the District and cooperation with private renewable energy finance firms. The emergence of the first offshore windfarm near Block Island (a part of Rhode Island) and pending larger sites off the coasts of Maryland and Long Island provide a unique manufacturing opportunity for nearby states.

China Leads Global Cleantech, Investment Soars

Many countries are diversifying their energy portfolios with greater emphasis on clean technology including wind and solar power generation, battery-charging and storage technology, distributed systems, and smart grid infrastructure.

Globally, about $7 out of every $10 spent on energy investment is expected to be invested in renewables through 2040. That amounts to $7 trillion of new investment. China has become the world leader in clean energy investment with $360 billion in planned investment through 2020. In 2016 China invested one-third more than the U.S. in renewable energy and pledged to create 13 million jobs in the sector.

India has committed to installing 175 gigawatts of clean electricity generation by 2022 and is seeking to attract more than $1 trillion of new investment to satisfy this goal. In Northern Europe, strong domestic policies have helped to foster domestic offshore wind companies now set to make billions in profits globally as the industry matures.

By 2040 electric vehicles are projected to make up 50 percent of all new car sales globally. Great Britain and France have already committed to making fossil-fuel cars obsolete by 2040. Mexico City, London, Paris, and Barcelona have already committed to banning gasoline and diesel vehicles by that year.

Cleantech Positions Lead Job Growth

Rapidly dropping prices for wind, solar, and battery technologies are leading to accelerated deployment and broad adoption. Clean technology industries are already showing that they provide an opportunity to link green innovation with substantial job creation. In fact, the projected top two fastest growing job occupations in the United States for 2016 through 2026 are solar installer and wind turbine technician with 105 percent and 96 percent increases respectively according to the U.S. Bureau of Labor Statistics.

Growing solar energy investment leads to more jobs in rooftop installation, operations, and maintenance. Most important, *these jobs cannot be outsourced.* As the U.S. electric vehicle industry expands and offers greater variety and cheaper vehicles, there will be demand for more electrical and mechanical engineers, technicians and assembly workers. Both the new plants that will produce the vehicles and the charging infrastructure required to serve them will create substantial new construction and installation employment. The emerging battery storage industry promises to be a boon to the manufacturing sector as innovations in molten salt and sodium technologies move out of the university and into the marketplace.

Higher education will need to adapt to train graduates with new capabilities. Examples include: 1) engineers adept at controlling distributed and hybrid systems, 2) IT workers who can build security platforms for complex electricity infrastructure, and 3) policymakers who understand how to incentivize smart application adoption.