

# Colorado Cleantech Action Plan

A roadmap to guide the development of Colorado's clean technology industry

## **Colorado Cleantech Action Plan - Executive Summary**

Colorado's cleantech industry has established a place at the forefront of the global industry, but it will face challengers that have also recognized the opportunities presented by the cleantech industry. Other states and countries are investing internally to shift their economies to serve the growing market for cleantech. This plan outlines the areas in which the investment of stakeholder time, funding, and expertise can have the most significant impact on Colorado's ability to sustain and grow a leadership position in the cleantech industry that will drive the state's economic growth in the coming decades.

### **Cleantech Is Growing in Colorado and Creating Thousands of Jobs.**

Cleantech in Colorado is an established and growing part of the state's economy. Between 1999 and 2009, Colorado's cleantech industry grew at an annualized rate of 18 percent, more than twice the rate of the Colorado economy as a whole (8 percent).<sup>1</sup> Today, it includes more than 20,000 workers employed by over 1,700 companies.<sup>2</sup> Since 2007, Colorado has created more than 5,000 cleantech jobs through a diverse set of cleantech company operations.<sup>3</sup>

### **Colorado's Key Strength Is in Innovation.**

The strength of Colorado's energy-focused research capabilities is widely cited as one of the state's greatest cleantech assets. With the National Renewable Energy Laboratory (NREL) at its center, Colorado's cleantech research cluster includes the state's major research universities as well as other federal laboratories such as the National Institute of Standards and Technology, whose work complements and supports the cluster's cleantech focus. As the only U.S. Department of Energy (DOE) lab focused exclusively on DOE's Office of Energy Efficiency and Renewable Energy programs, NREL captures a large share of DOE's clean energy-related funding.

### **Colorado's Leadership in Cleantech Policy Is Critical in Growing the Industry.**

Colorado's leadership in the policy and political arenas has bolstered the state's attractiveness for the development of renewable energy projects and provided the certainty needed to attract other cleantech businesses. Colorado's renewable energy standard remains one of the most ambitious in the country. In addition, the Governor's Energy Office and other partners have actively promoted Colorado's 'New Energy Economy' and the state's Climate Action Plan as drivers of economic development. This demonstrates the type of leadership that creates a stable policy environment for cleantech companies.

### **Innovation and Policy Support Drive Manufacturing and Project Development.**

Colorado's strength in innovation drives new development in the manufacturing and deployment segments of the cleantech industry. The results generated by the innovation segment of the economy attract product development and manufacturing operations to the state. The proximity to both incremental and game-changing innovations enables these companies to optimize their operations and produce better products for their customers. In parallel, new products that result from the innovation centers in Colorado can be deployed in the state during the pilot and demonstration stages through university and DOE test facilities and utility programs. These testbeds enhance the state's leadership role in innovation while creating jobs and new implementation expertise.

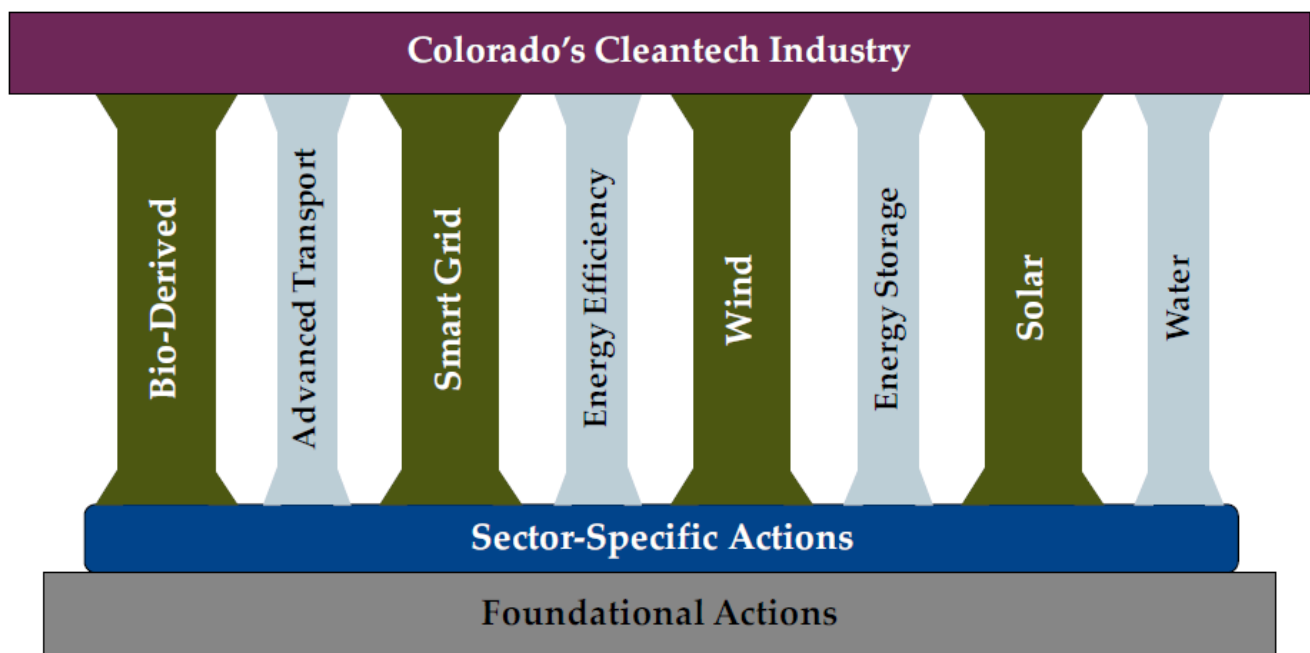
### **Leading Cleantech Companies Are Present in the State and Driving Industry Growth.**

Colorado is home to leading cleantech companies across sectors and across the value chain. These include global companies such as Vestas, GE Energy Controls, Abengoa, RES Americas, SMA Solar, Conoco Phillips, and Bach Composite Industry. These companies are creating a draw for supply-chain partners to locate in Colorado, as six Vestas suppliers have already done. In addition, there are many cleantech companies that started in Colorado, such as Abound Solar, Ascent Solar, Solix Biofuels, PrimeStar Solar, and Advanced Energy Industries.

**The Wind, Solar, Smart Grid, and Bio-Derived Sectors Are the Pillars of Colorado’s Cleantech Industry.**

Through a deliberate and thorough screening process and with data from Navigant Consulting, Inc.’s independent analysis, the Colorado Cleantech Industry Association (CCIA) Steering Committee identified the wind, solar, smart grid, and bio-derived sectors as Colorado’s priority cleantech sectors. This action plan is designed to serve the entire cleantech industry in Colorado, although the set of actions was developed through the lens of the priority sectors. Because the priority sectors were identified as those with the most potential to sustain and grow Colorado’s leadership in cleantech, priority was placed on understanding and addressing the opportunities and challenges in those sectors. Four other sectors were identified as emerging sectors, which are anticipated to play an important role in Colorado’s cleantech industry in the mid- and longer-term; these sectors are advanced transport, energy-efficient buildings, energy storage, and water. The actions in this plan address the critical challenges of the priority sectors in depth, and nearly all the actions can benefit other cleantech sectors.

**Figure 1. Building Colorado's Leadership Position**



**Capital and Leadership Are the Foundation for Commercializing Colorado’s Cleantech Innovations.**

Leveraging innovation to drive job gains in manufacturing and deployment requires a stronger focus on the resources needed to convert innovation into products, namely, capital and leadership. The commercialization of technologies involves connections between the researchers that develop the ideas and the market experts that understand how the ideas can serve the market. Navigating the commercialization process requires capital and leadership, both of which are limited in Colorado’s cleantech industry. To address these challenges, this plan proposes the following actions that are foundational for growing the state’s priority cleantech sectors:

- » Increase funding for seed and technology acceleration

- » Increase funding for early-stage companies, including the establishment of a fund of funds
- » Strengthen cleantech company incubators and accelerator programs
- » Boost executive leadership training programs

### **Each Cleantech Sector Has Its Own Priority Actions, Though Many of These Priorities Overlap.**

Many cleantech manufacturers with plants in Colorado, particularly those in the wind and solar sectors, need support to attract more of their component suppliers. Yet, the state of Colorado faces competition from other states and regions that offer more compelling incentives to locate in their states. This plan proposes that the state prioritize and actively recruit the companies it wants to add to Colorado's cleantech industry.

Less mature technologies such as those in the smart grid and bio-derived sectors need test and scale-up facilities to prove their viability on a larger scale before entering large-scale industrial production. Although NREL, SolarTAC and InteGrid Laboratory provide facilities for testing and scale-up, further test-bed infrastructure and incentives for deployment are needed in Colorado. This plan recommends the strengthening of such infrastructure and accompanying support for Colorado companies to access these facilities.

In-state developers of large-scale wind and solar plants report that delayed transmission construction is a major impediment to development. Although SB07-100, the SB07-91 task force, and the Renewable Energy Development Infrastructure (REDI) have established the foundations for a transmission system expansion that benefits renewable energy, this plan proposes an effort to accelerate transmission and renewable energy project approvals.

### **Supporting Actions Are Also Needed to Grow Colorado's Cleantech Industry.**

Finally, a set of supporting actions will help grow each of the state's four priority sectors as well as the cleantech industry as a whole. Developing an integrated statewide energy plan will enable more informed decision making by state government and the business community in terms of how the value of wind, solar, smart grid, and bio-derived can be fully captured within Colorado's overall energy landscape. Collaborating with the state's sizeable natural gas industry may identify potential new applications, end markets, and enablers for cleantech—such as using photovoltaics to supply power at well pads. Enhancing commercialization efforts within the state's universities and federal labs will help ensure that the most promising technological advances in cleantech make it out of the labs and into the market. Finally, preparing the state's workforce to build and service wind turbines or deploy smart grid technology through internships and job retraining programs is critical to ensure further scale and growth in these sectors.

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## **A Mandate to Lead**

### ***Why CCIA led the development of the Colorado Cleantech Action Plan***

#### **Background**

The Colorado Cleantech Industry Association (CCIA) led the development of the Colorado Cleantech Action Plan released on October 18, 2010.

Adding cleantech companies and jobs in Colorado requires a thoughtful analysis of Colorado's cleantech assets and core competencies, an identification of the barriers that limit the industry's growth in the state and the development of a comprehensive, measurable action plan. As the only industry-led, statewide organization

representing the breadth of the cleantech industry in Colorado, the CCIA is dedicated to creating a business climate that enables Colorado to lead the world in clean technology.

CCIA's ability to convene statewide stakeholders is key to the development of the cleantech industry. In 2010, the CCIA's almost 200 members represent all segments of the cleantech industry including companies along the value chain of the wind power, solar power, bio-derived, smart grid, clean transportation, energy storage, energy efficiency and advanced water sectors. Other members include the investment community, the state's research institutions, economic development agencies, support service sectors and educational/workforce institutions.

### **A Mandate to Lead – Why CCIA?**

Because of its industry-focus and industry leadership, the CCIA was best suited to drive the development of a professionally led analysis and action planning effort. Eight economic development, research institution and state government agencies determined that the CCIA was the ideal entity to commission the action plan and convene a broad group of stakeholders tasked with moving the project forward.

In the space of a few months, commitments were received from the Colorado Economic Development Commission, Colorado Governor's Energy Office, Colorado School of Mines, Colorado State University, Colorado Workforce Development Council, Metro Denver Economic Development Corporation, University of Colorado, the U.S. Department of Commerce Economic Development Administration to fully fund a \$200,000 action plan.

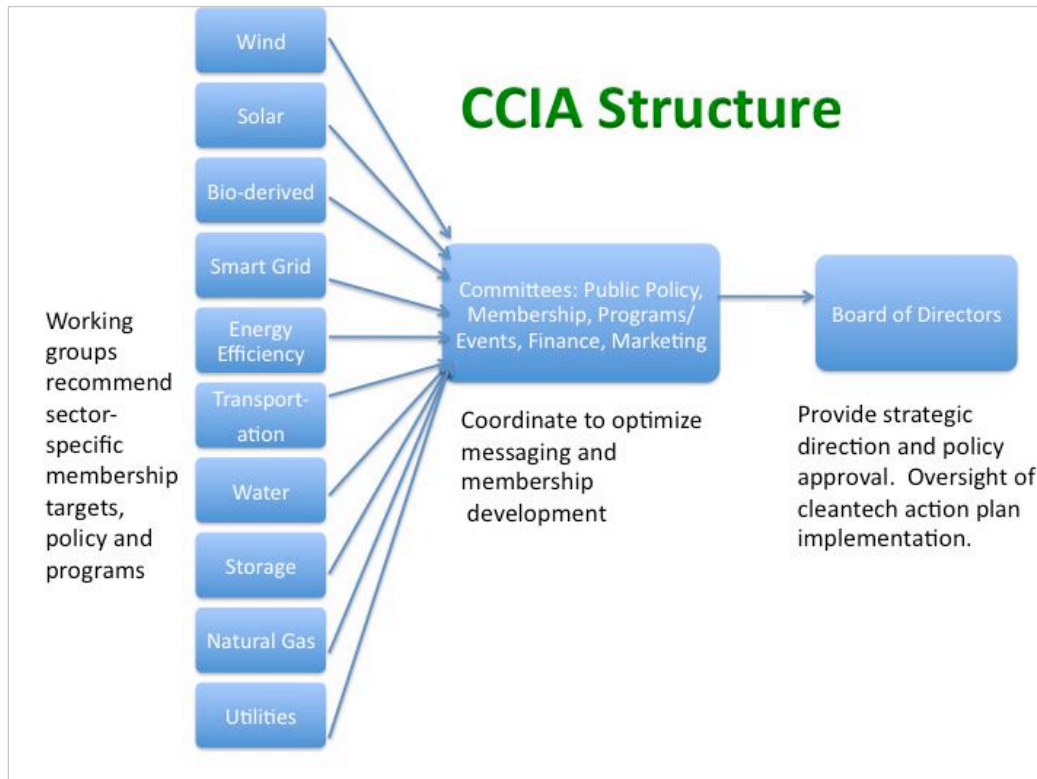
The CCIA's successful fundraising for a Colorado Cleantech Action Plan is a testament to the value that the state's cleantech stakeholders place on an industry-led cleantech organization. No other state in the Rocky Mountain region can boast a comprehensive, measureable plan to grow the cleantech industry and no other organization is as well positioned to lead the implementation of the action plan as the CCIA.

### **Looking Ahead to CCIA's Implementation of the Action Plan**

The Colorado Cleantech Action Plan is an aggressive, complex strategy that will require numerous and unlikely statewide players to be engaged and contributing partners.

The majority of those who will be involved in implementation are already at the CCIA's table. Cleantech companies, government, investors, incubators, economic development, research institutions and labs, workforce, utilities and the natural gas industry are among the CCIA's members or partners. Because the CCIA is a pragmatic, economic development organization, relationships will be forged with the traditional energy industries in the state and rural co-op and municipal utilities.

In addition, the CCIA's organizational infrastructure is already in place to address the identified strategies. Sector specific working groups, comprised of companies within those sectors, as well as joint cleantech - natural gas and cleantech - utility working groups exist to work through the strategies for implementation.



As several actions require legislation, the CCIA is also well positioned as the voice of the industry - advocating for supportive measures at the state and federal levels. Business and economic development legislation and regulation that support the development of the cleantech industry are at the top of the CCIA's public policy agenda. Action items that require legislative or regulatory strategies will be developed through the CCIA's public policy committee.

Certainly the CCIA's place within the Colorado Center for Renewable Energy and Economic Development (CREED) – a joint project between the Colorado Office of Economic Development and International Trade, Governor's Energy Office and the National Renewable Energy Laboratory (NREL) – will facilitate the Association's ability to help translate the lab's tremendous research capabilities into growing jobs and companies in Colorado.

Lastly, the CCIA takes very seriously its relationship with the state's elected and appointed officials, recognizing that legislation and regulation are essential tools necessary to grow the industry. The Association is a non-partisan organization with supportive relationships on both sides of the political aisle. CCIA will work closely with the new administration, state general assembly and congressional delegation to implement the identified action steps.

**Growing Colorado's cleantech jobs, increasing the tax base and generating revenue are the goals of the Colorado Cleantech Action Plan and the Colorado Cleantech Industry Association is ideally suited to implement the action steps that are required to meet these goals.**



## End Notes

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