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Renewable Energy & Energy Efficiency: Economic Drivers for the 21st Century

- National Data
- Colorado Data

Manufacturing Location Consideration

- Labor Costs
- Labor compatible skill sets
- Energy Costs
- Capital Costs (Subsidy availability)
- Ready markets – local retail/wholesale opportunities

Labor Costs

- Manufacturing is far less labor intensive than sales / installation labor force
- Most manufacturers have minimum sales levels prior to site considerations

Developing Definitions

“You can’t know where you are going until you know where you have been”

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Developing Definitions

Renewable Energy (RE)

Workers and revenue in the major RE technologies: wind, photovoltaics, solar thermal, hydroelectric power, geothermal energy, biomass (ethanol, biodiesel, and biomass) and fuel cells and hydrogen

Developing Definitions

Energy Efficiency (EE)

- Energy Services Companies (ESCO's) – such as weatherization, insulation, efficiency remodeling, etc.
- Workers and revenue that are part of the EE industry – recycling, reuse, remanufacturing
- Energy Efficient construction firms, green builders and related industries

Developing Definitions

Energy Efficiency cont.

- Also workers and revenue in industries in which only a portion of the output is classified within the EE sector – household appliances (Energy Star vs. others) HVAC systems, etc.

Developing Definitions

RE & EE

- In our study, we include RE&EE activities in the federal, state, and local government
- Also those at universities, nonprofits, trade and professional societies, NGO's, foundations, consultancies, investments companies (i.e., analysts) and other related businesses/organizations.

New National Statistics

Summary of the U.S. Renewable Energy and Energy Efficiency Industries in 2007

Industry	Revenues (billions)	Industry Jobs (thousands)	Total Jobs (thousands)
Renewable Energy	\$42.58	218	504
Energy Efficiency	\$1,002.92	3,745	8,586
TOTAL	\$1,045.50	3,963	9,090

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New National Forecast

U.S. Renewable Energy and Energy Efficiency Industries in 2030

	Revenues (Billions of 2007 Dollars)			Total Jobs Created (Thousands)		
	Base Case	Moderate Scenario	Advanced Scenario	Base Case	Moderate Scenario	Advanced Scenario
RE	\$98	\$212	\$560	1,305	2,846	7,328
EE	\$1,868	\$2,036	\$3,734	14,953	16,658	29,878
Total	\$1,966	\$2,248	\$4,294	16,258	19,504	37,206

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Colorado Statistics

Summary of the Colorado Renewable Energy and Energy Efficiency Industries, 2007

Industry	Revenues (millions)	Industry Jobs	Total Jobs
Renewable Energy	\$1,082	4,415	10,075
Energy Efficiency	\$9,129	35,470	81,210
TOTAL	\$10,211	39,885	91,285

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Colorado Forecast

Summary of the Colorado Renewable Energy and Energy Efficiency Industries in 2030

	Revenues (Millions of 2007 Dollars)			Total Jobs Created		
	Base Case	Moderate Scenario	Advanced Scenario	Base Case	Moderate Scenario	Advanced Scenario
RE	\$2,076	\$3,811	\$13,131	17,370	29,400	113,375
EE	\$17,681	\$20,479	\$44,345	174,810	208,620	499,550
Total	\$19,657	\$24,290	\$61,476	192,181	238,020	612,925

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How was Colorado's success possible?

- AB – 37 Citizen's Initiative
- Voter Directed RPS
- Governor Bill Ritter - Doubled RPS two years after it was launched
- “New Energy Economy as State Policy”

Colorado RENEWABLE ENERGY MAGNET

Legislative sampler

- HB 08 – 1335: \$1 Billion over 5 years for High Performance Schools
- SB 08 –147: \$1 Billion over 10 years for High Performance Buildings *if funded through the Department of Local Affairs – approval through Office of State Architect*
- HB 07 –1037: Instructs Colorado Gas & Electric IOUs to invest in DSM \$1 Billion in 10 years
- HB 07 – 1146: IECC 2003/6 Building Code for all local governments that have a building code
- GEO to invest \$10 million this year in local communities – DOLA Initiative

Colorado RENEWABLE ENERGY MAGNET cont.

RESULTS...

- VESTAS WIND SYSTEMS A/S of Denmark has a **600 employee** wind turbine manufacturing plant in Windsor CO **In September, VESTAS announced that they would add an additional 1800 jobs!**
- AVA SOLAR INC solar manufacturing plant in Longmont, CO – **500 workers**
- BLUE SUN BIODIESEL LLC of Golden CO
- COLLABORATORY FORMED – a joint venture of the University of Colorado at Boulder, Colorado State University, the Colorado School of Mines and the National Renewable Energy Lab

Colorado RENEWABLE ENERGY MAGNET cont.

- 02/11/2008 – ASCENT SOLAR TECHNOLOGIES relocating to Thornton, CO. To produce 100 megawatts of solar panels per year by 2011, creating **300 jobs**
- 02/21/2008 - ABENGOA SOLAR PLANS WORLD'S LARGEST SOLAR POWER PLANT – Lakewood, CO based Abengoa Solar announced a 280 MW plant to be built near Gila Bend AZ. **1500 construction jobs and 85 full-time workers** once operational

Colorado RENEWABLE ENERGY MAGNET cont.

- Renewable Energy Systems America Inc. (RES), a British developer and builder of wind energy farms, is moving its headquarters from Austin, Texas to Broomfield. Involved in 12 percent of US wind farm installations, **including the 300 MW Cedar Point Wind Project in CO.** It **employs 140** people in Broomfield and 90 others in the US
- 06/03/2008 – SIEMENS PICKS BOULDER FOR R&D CENTER. Siemens Energy will establish a new US wind turbine research and development center in Boulder. Launching with 12 employees and growing to **50 employees** by 2013

Colorado RENEWABLE ENERGY MAGNET cont.

- 06/06/2008 – CALIFORNIA SOLAR FIRM EXPANDS OPERATIONS TO COLORADO. “Taking advantage of Colorado’s ‘generous incentives’ for businesses to install solar-electric systems, California-based REC Solar Inc has set up a commercial division in Westminster, CO

Colorado RENEWABLE ENERGY MAGNET cont.

- 06/18/2008 – CONOCOPHILLIPS PLANS FOR **7000 JOBS**. ConocoPhillips new Colorado campus in Louisville should open earlier than expected and will be able to support 7000 employees the company announced today. Located on the 432 acre former Storage Technology campus will bring a core group of managers to the new site, but the rest will be new employees. It will create an “international learning center and alternative energy/advanced research center at the end of 2011.

Colorado RENEWABLE ENERGY MAGNET cont.

- 06/20/2008 – IBM OPENS ‘GREEN’ DATA CENTER ON BUILDER CAMPUS
- The 115,000 square foot, \$350 million center will provide data services for 16 clients. The building will take advantage of Colorado’s low humidity and cooler temperatures – using a water-cooling system to save energy when conditions are favorable.

Colorado Case Study – Support from the State

- **GEO** – initiatives for consumers, business and non-profits
- **Colorado Climate Action Plan** – training green-collar workers for RE&EE to reduce GHG emissions
- **Greening the State Government** – executive orders to increase use of RE&EE plus conservation
- **New Energy Communities Initiatives** – greening public facilities, greening downtowns and homes

What Lessons Have We Learned?

- Leading states show that the road to the new energy economy is short and smooth
 - Ready Market
 - Welcome Environment
 - Executive Leadership

A READY Market

- Robust state tax incentives to create a local market
- Renewables technology pulls energy efficiency along

A Welcoming Business Environment

- A suite of incentives for business
- Property tax relief, relocated assistance, etc.

Aggressive Executive Leadership

- Governor must be leader in promoting the environment for these businesses to accept being wooed
- Must be accessible and a positive spokesperson

What are the keys to compete in the New Energy Economy?

- Ready Market
 - Robust incentive programs to build a local RE/EE market
- Welcome Environment
 - A suite of incentives for businesses to consider relocation
- Executive Leadership
 - Governor as RE/EE salesperson

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THANK YOU



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