Building A Sustainable Renewable Energy Infrastructure West Texas Rural Workforce Network

SOLAR PETROLEUM NATURAL GAS COAL GEOTHERMAL BIOMASS WIND SOLAR

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Executive Summary

Texas has more renewable energy potential than any other state

Wind power provides

11% of the electricity capacity in Texas

Texas is building over \$5 billion

in electric transmission lines

West Texas has 70% of all wind farms in the state

The Building a Sustainable Renewable Energy Infrastructure Project, funded by the Texas Workforce Commission, was a project implemented by four Workforce Solutions boards in West Texas-Permian Basin, West Central, South Plains and Concho Valley. These boards exist in a vast geographic region covering sixty-four (64) counties. The purpose of the project was to develop a comprehensive Regional Renewable Energy Plan, to map resources, identify barriers, and describe changes that are needed in the Utilities,

Construction, and Manufacturing sectors to pre-pare the West Texas Rural Workforce Network's (WTRWN) regions for the surge in jobs and economic opportunities in the field of renewable energy.

To accomplish the goals of the project, the West Texas consortium comprised of workforce boards, community colleges/ universities, employers, training providers and economic development organizations provided valuable information through surveys, regional meetings, focus groups and onsite visits. During the project period five reports were developed that focused on renewable energy building codes, credentials requirements, workforce needs, loan programs, financial incentives, educational capacity, city/county governmental training needs and attitude/ perception on renewable energy.

RENEWABLE ENERGY

Renewable energy or renewable power is by definition, renewable, such that this source of power can replenish itself over and over again. The energy landscape in West Texas includes both renewable sources such as solar, wind, biomass, and geothermal as well as conventional energy from coal and natural gas.

Nearly a century ago, oil was discovered in West Texas. Now the region is undergoing another boom –WIND GENERATION- with additional opportunities in renewable energy. Texas has more renewable energy potential than any other state due to its size, diverse climate and presence of extremely favorable natural geographic conditions, i.e., strong winds and high levels of solar radiation.

In order to harness this opportunity, counties, networks and individuals will need to collaborate and build a sustainable renewable energy infrastructure. There are a number of factors to consider within the landscape of West Texas' current renewable energy environment.

Wind farms generate almost all renewable energy in West Texas. Though there is vast potential for solar energy, there are no "largescale" solar plants currently. West Texas has installed over 6,600 megawatts of wind power and will add an additional 4,500 megawatts in the next five years. The state of Texas has 9,000 megawatts of wind power, with capacity to fully power 2.4 million homes with wind energy.

More importantly for West Texas, this fast growth in generation has taken place mostly within the project area. There are more wind generating plants in Texas within the 64-county area than there are in all other Texas counties combined: nearly 70 percent of all wind farms in the state are in the project area.

Texas Wind Farm Map



DEMAND FOR RENEWABLE ENERGY

The state of Texas consumes the most energy nationwide. At the same time, Texas is a primary generator and user of renewable energy. Wind power accounted for six percent of all power generation in the state in 2009. Growth in renewable energy has been dramatic over the last twenty years in Texas.

The state has paved the way for even greater renewable energy development with the construction of electric transmission lines to transport electricity generated by new wind and solar plants to population centers by 2014. A statewide plan for Competitive Renewable Energy Zones (CREZ) includes construction of several major transmission projects in West Texas. This construction will not only provide infrastructure investment, but also the potential for workforce development.

WORKFORCE NEEDS

The workforce needs for renewable energy industries are similar to those in traditional energy industries. There is opportunity for current workers to shift to the renewable energy sector. Many of the likely green jobs or skills needed include: installation, electricians, construction, plumbing, mechanical skills, manufacturing and assembly, design, electrical and mechanical engineering.

Current employers in the renewable energy industry want to grow in the short term and have stated that they do not have enough talent. Of the employers surveyed, 72% report they plan to increase the number of renewable energy jobs in the next 5 years.

72% anticipate increasing the number of jobs in renewable

There is a strong need for qualified employees in the renewable energy job sector in the West Texas region. Community colleges reported that individuals who complete renewable energy courses have an almost 100 percent placement rate with renewable energy employers.

Employers indicated the skills and training needed for renewable energy jobs:



POPULATION

Population is declining and aging in West Texas. Unemployment in West Texas is lower than the rest of the state by 1%. Fortunately, West Texas is seeing gradual increases in education levels, including high school graduation, associate degrees and four-year college degrees. However, there is a great need to continue to develop and market workforce programs to employers and potential employees.

INCENTIVES

Most financial incentives for renewable energy in West Texas are offered by electric utilities. Utility-funded rebates and federal tax incentives are spurring solar photovoltaic development in other areas of Texas. However, West Texas homeowners and commercial businesses have relatively low participation in currently available financial incentive programs to support energy efficiency improvements and renewable energy installations.

EDUCATION

West Texas is home to many universities, colleges and continuing education institutions. Many educational institutions in West Texas offer basic and advanced renewable energyrelated courses to help meet workforce development needs in the region. However, a gap exists in training certain skills due to inadequate funding and lack of faculty. There is also opportunity for the independent school districts and community colleges to develop and increase offers for dual credit courses.

West Texas Community Colleges Education Program Data 2009-2010



A stronger partnership among these educational institutions is needed to offer and promote dual credit courses. The regional workforce boards, community colleges, and universities have a strong working relationship for coordinating training needs for the renewable energy industry and other industries in the West Texas region to become a leading educational hub for renewable energy.

ATTITUDES/PERCEPTION OF RENEWABLE ENERGY

A large majority of West Texans surveyed was aware of the wind farm boom. Seventythree percent (73%) surveyed stated that personal investment in renewable energy is important or very important and 74% stated that city and county investment in renewable energy is important or very important.

Observations

Renewable energy comes at two scales:

- Wholesale big wind farms and solar plants
- Retail small scale solar or wind installations on homes and businesses

The drivers of big renewable energy projects include:

- The price of natural gas high price helps renewable energy; low price slows it
- Availability of wind and sun
- State and federal energy policies
- The overall state energy market – how much will electricity generated by renewable energy sell for?

Renewable and conventional energy are directly linked:

Jobs, policies, economy all move in similar ways.

West Texas has great success in conventional energy and can build on that for renewable energy. Conventional energy has skills and pathways that can transfer to renewable energy.

Utilities are important players in renewable energy and job creation, e.g., new call centers in Abilene and Lubbock were recently announced by TXU.

State policy makers are interested in

renewable energy in West Texas – General Land Office, Comptroller and the Governor's office.

Completion of the CREZ transmission lines is expected to result in the addition of even more large-scale wind and solar generation in the region over the next 10 years.

Electric vehicles could present opportunities for the region: e.g., new automotive training, installation of public charging stations.

Federal facilities are required to implement energy efficiency and renewable energy installations where possible, and they could be enlisted as partners in regional energy activities.

Recommendations

A. Establish a Regional Energy Alliance Council (REAC)

The Energy Alliance council would create a group that can leverage those collaborations and mobilize different constituents to pursue opportunities that present themselves. This council will provide leadership and ensure sustained development of renewable energy as a driver for regional workforce and economic development. The Council would serve the following broad functions:

- Enlist a high level group that includes CEOs and decision makers
- Develop and leverage their own networks to promote renewable energy in the region
- Serve as a catalyst for regional efforts in renewable energy
- Serve as a liaison among the regions to facilitate coordination
- Serve as a liaison between the region and state and national entities to facilitate flow of

- B. Develop a Regional Public Awareness campaign to advertise "West Texas is a key player in renewable energy in Texas, nationally and worldwide"
 - Develop an internet portal to "brand" the region as "energy friendly" and provide alerts for funding opportunities, job fairs, etc.
 - Sponsor an annual "energy leader" award program that highlights a project or business that has contributed to the region.
 - Seek ways to outreach to high schools to raise awareness about renewable energy and energy efficiency.
 - Sponsor an annual legislative/policy forum on energy that brings State leaders to the region.
 - C. Formalize the Renewable Energy collaborative infrastructure
 - Ensure the following members are represented
 - Workforce Solutions boards
 - Economic development agencies
 - Electric and gas utilities
 - Private energy developers
 - Schools, community colleges and universities
 - Cities and counties
 - Local Community leaders
 - o Media
 - Legislators
 - Institute a collaborative structure that would:
 - Develop priorities and goals Define roles and
 - responsibilities

Develop meeting structure Create mission and vision

- D. Establish a regional training program for city/county government, firefighters and city officials to address the new requirements in renewable energy. The training could include:
 - New Energy building code requirements that SECO will be promoting.
 - Solar photovoltaic technologies for firefighters
 - Interstate Renewable Energy Council -"Solar Instructor Training"
- E. Identify potential funding sources to sustain a Regional Energy Alliance Council. Sources could include:
 - Texas Workforce Commission
 - Department of Labor
 - State agencies e.g., State Energy Conservation Office
 - Private foundations e.g., The Cynthia and George Mitchell Foundation
 - Regional economic development groups
 - Utility companies
 - US Department of Energy

Conclusion

While West Texas is a leader in the renewable energy industry, it must address workforce issues to remain so. The region's economic strength will depend greatly on its ability to attract, retain and develop a skilled and versatile workforce. By collaborating to expand training and education programs, in tandem with effective communication amona renewable energy companies, economic development organizations, utilities and educators, West Texas can capitalize on the growth of the most important emerging industry in our country. The time is now to move forward in creating state policies that will meet our power needs and create jobs in this growing energy sector. West Texas should continue its push in renewable energy because renewable energy is putting West Texas on the map as a leader in the energy sector.

NATIONAL, STATE AND LOCAL TRENDS IN RENEWABLE ENERGY

INTRODUCTION

Federal funding and national economic factors continue to shape the emphasis of specific energy technologies. Federal regulations to reduce carbon or increase the contribution of renewable energy continue to be discussed in Congress but have not yet passed and are not expected to be finalized in 2011.

\$70 billion in direct spending and tax credits under the American Recovery and Reinvestment Act of 2009 (ARRA, i.e., economic stimulus funding) was the largest federal commitment ever to clean energy and transportation in the US. Energy efficiency is considered one of the most important and least expensive sources of energy. Thanks to ARRA funding, the focus of US energy policy and energy investment continues to be on the following:

- Energy efficiency: more efficient building energy codes, commercial green buildings, building commissioning to ensure enhanced energy performance, residential weatherization, energy efficient appliances, high performance green buildings, high efficiency cooling and heating technologies
- Smart grid technologies: advanced meters with two-way communications capabilities, automation, "self-healing" and communication devices on the electric utility distribution and transmission system
- Wind energy generation: primarily large-scale power plants, which typically require new electric transmission infrastructure to move the electricity to population centers.

- Solar: both large-scale and smaller installation on individual customer facilities; solar includes both solar photovoltaic technologies which generate electricity and solar thermal technologies which can heat water to generate electricity on a large scale or provide hot water for residential or commercial use.
- Energy storage: batteries and other infrastructure to store electricity generated by intermittent or off-peak renewable sources and make it available when needed on peak.
- Hybrid and advanced vehicles: electric vehicles and the associated vehiclecharging infrastructure including residential and public stations.

NATIONAL CHALLENGES

Factors that affect renewable energy nationally and challenge future growth include the price of natural gas, availability and price of equipment, access to federal tax incentives, availability of project financing, availability of transmission to move renewable generation to load centers, availability of trained workforce, and federal and state energy policies. The relatively low price of natural gas, driven by the development of new supplies of natural gas from shale formations, has slowed the development of renewable energy generation nationwide. However, federal carbon policies or other legislative requirements for renewable energy could spur activity very quickly.

STATE OF TEXAS TRENDS

Texas leads the nation in total energy consumption due to its large population and energy-intensive industries. Texas has more renewable energy potential than any other state, due to its size and diverse climate and presence of extremely favorable natural geographic conditions, i.e., strong winds and high levels of solar radiation. There is also significant potential for development of biomass and geothermal energy.

State regulatory policy has spurred the development of more large-scale wind generation than in any other state. In the West Texas study area, over 6600 megawatts of wind generation have already been installed and another 4500 megawatts have been announced and could be built in the next five years. Statewide, the total wind generation exceeds 9000 megawatts. Clean energy, primarily wind, now provides 8% of the electricity capacity in Texas.

A major factor in renewable energy development in the West Texas study region will be the construction of electric transmission lines to transport electricity generated by new wind and solar plants to population centers to the east. In 2008, a statewide plan for Competitive Renewable Energy Zones (CREZ) was approved by the Texas Public Utility Commission (PUC) and the Electric Reliability Council of Texas (ERCOT). Project developers have been selected to build specific projects in assigned regions and construction is expected to be complete in 2014. The West Texas study area is the site of some of the key elements of the CREZ transmission infrastructure; this construction will not only provide infrastructure investment, but also the potential for workforce development.

IMPACT OF RENEWABLE ENERGY DEVELOPMENT

The benefits of adding more renewable energy in Texas have been underscored by two recent analyses conducted by highly regarded independent consultants. Billy Hamilton Consulting on behalf of the Cynthia and George Mitchell Foundation released one of those studies in August 2010. The study, "Texas' Clean Energy Economy: Where We Are, Where we're Going, What We Need to Succeed," examined three potential scenarios for legislation to incentivize green energy investment. In the baseline scenario, the average residential consumer would see an increase of \$4 a month by 2020 for a 15% increase in the state's clean energy generating capacity, generating 6000 new jobs per year and generating gains in state productivity and state and local tax revenues. The report quantifies a basis for recommending state policies such as a renewable portfolio standard, net metering, tax policies and other financial incentives.

In May 2010 another study conducted by The Perryman Group examined the economic impact of investment in new wind generation and the CREZ transmission lines. The Perryman study, called "Winds of Prosperity" estimated \$30 billion in economic gains, thousands of new jobs, and the addition of nearly \$2 billion in additional state and local taxes, among other benefits. Dr. Ray Perryman, president of The Perryman Group, said "Our study indicates that the investment in CREZ transmission infrastructure will help solidify Texas' position at the forefront of wind power, renewable and associated industries, providing an additional \$3.8 billion in gross product per year and generate more than 40,000 jobs."

Even if these two studies turn out to significantly overestimate the results, there is still, without question, substantial economic impact potential from renewable energy development in West Texas. These two prominent studies provide helpful quantification of economic and job impacts that can help justify future collaborative activities.

"GREEN-RELATED" ECONOMY

Explosive growth in the oil and gas sector has buoyed employment and the economy in this region over the period analyzed as it has continued to do periodically since 1923 when the discovery of West Texas oil changed the petroleum industry. However, excessive dependence on one sector whose fortunes rise and fall with the spot market can expose the region to economic hardship in the event of market volatility. The clean energy sector has repeatedly been identified as a sector that may help provide this kind of volatility hedge. A recent study by former Texas Vice-Comptroller Billy Hamilton.¹ West Texas is a particularly suitable location to become a clean energy hub based on its human and economic geography.

In addition to the region's large natural gas resources, West Texas contains areas where the wind blows steadily and at high speeds, setting the stage for another energy boom that will be addressed in the next section of this report. Furthermore, the region receives high amounts of solar radiation year-round, providing the potential for a new industry and a source of power whose supply, unlike wind, peaks at the same time as demand for electricity.

WEST TEXAS AND THE TEXAS WIND BOOM

Texas is fifth in the nation in terms of renewable energy generation. Removing hydroelectric power from the equation, Texas is number one in renewable energy capacity and generation, thanks mostly to a fastgrowing wind industry. The Texas wind industry, centered in West Texas, has received significant attention over the past decade. The numbers may be familiar to some, but are worth reiterating for the sake of emphasis: wind power accounted for five percent of all power generation in the state in 2009.

From 1996 to 2009, renewable energy generation grew by 800 percent. This was record setting growth compared with generation from fossil fuels, which only grew 15 percent over the same period. From 2000-2009, wind accounted for 81 percent of all electric generation growth in the state. Wind continued to grow through the recession of 2008-2009 (adding 122 percent to 2007 levels), even as slowing economic activity brought overall electric generation down from 2008-2009 (overall generation fell by 2.1 percent compared to 2007 levels). The primary fuels that it displaced were coal and natural gas according to the Energy Information Administration.



More importantly for West Texas, this fast growth in generation has taken place mostly within the 64-county area of this report. In fact, according to the International Wind Energy Association, there are more wind generating plants in Texas within the 64-county area than there are in all other Texas counties combined: nearly 70 percent of all wind farms in the state are in the 64-county area.

Wind as % of Overall 2009	6%
Wind as % of all growth 2000-2009	103%
Fossil Growth	15%
Renewable Growth	801%
Wind Growth 1996-2009	24153%
Annualized	50%
Wind Growth 2000-2009	19,533,957
Overall 2000-2009	18,889,526
Source: Energy Information Administration	

Texas Wind Farm Map



STATE CHALLENGES

While many conditions favor renewable energy development in West Texas, there are several factors that may have at least a temporary dampening effect:

- Lower economic growth throughout the state could slow the energy market
- Texas' unprecedented budget deficit may work against new renewable policies, which could be perceived as increasing the cost of electricity to consumers
- Public resistance to construction of the CREZ lines could slow their development
- Lower natural gas prices worsen the economics of renewable energy projects
- Lower public interest in energy efficiency and renewable energy could slow the adoption of new technologies that otherwise could spur economic development in the region

WEST TEXAS DEMOGRAPHICS

POPULATION



The four Workforce Solutions Boards (Permian Basin, West Central, South Plains and Concho Valley) in this study cover 64 counties and according to 2010 US Census redistricting data, 79 counties in Texas lost population from 2000-2010. Thirty-six of these counties were in the 64-county region." This map, produced by the Census Bureau, shows that population growth has been strongest in suburban counties of the Dallas-Houston-San Antonio triangle, in El Paso and around Austin.^{III} Growth was weakest in the Panhandle and the Central Plains regions, although modest growth took place in regional hubs. One notable exception was Garza County. The town's mayor, Thressa Harp, attributes the population growth to a diverse economy: "Our economy is not bad. We have agriculture, oil, cattle and our prison [the county's largest employer]."iv

The population change picture is mixed for the 64 county region. Some growth did take place, particularly in the Permian Basin and South Plains WDAs, but this growth was still low relative to the rest of the state. Predictions from the Texas State Demographer's office based on recent data (2000-2007 trends) indicate that the region's growth will slow in the second decade of the 20th century. However, the latest available predictions were made in 2008. The predictions will be revised soon based on 2010 US Census data.

At the same time the growth trend is slowing in the region, the population is also aging. The share of the population under age 18 shrank by almost percent from over 27 percent to just over 25 percent. This segment of the population is predicted to remain at approximately this level through 2020.



POPULATION 2000-2020

				Growth	Growth
WDA	2000	2010	2020 (p)	2000-2010	2010-2020 (p)
Concho Valley	148,212	154,192	148,060	4.03%	-3.98%
Permian Basin	376,672	417,679	427,767	10.89%	2.42%
South Plains	377,871	411,659	411,966	8.94%	0.07%
West Central	324,901	327,390	333,884	0.77%	1.98%
64-County					
Area	1,227,656	1,310,920	1,321,677	6.78%	0.82%
State of Texas	20,851,820	25,145,561	30,858,449	20.59%	22.72%

Source: US Census Bureau, Texas State Demographer's Office (Migration Scenario 3.0)

LABOR FORCE

The West Texas Region's labor force grew by 12 percent, slightly less than the state's overall that grew by 15 percent. Unemployment is consistently lower in the 64-county area than in the rest of the state by approximately one percentage point. While the 64-county area had a lower unemployment rate than the rest of the state, the unemployment rate did increase in tandem with the rest of the state with the 2008 recession.



EDUCATION

Over the last decade, the overall level of educational attainment for the population age 25 and over saw significant improvements. For example, the percentage of the population with



less than a high school education decreased from 26 percent to 22 percent, while the number of individuals with an associate's or a bachelor's degree increased by two percent together.

PERSONAL INCOME

Per capita personal income has remained slightly lower than the state average across the 64county region. At the same time, this gap has begun to narrow in recent years.



WEST TEXAS ECONOMY

MAJOR INDUSTRIES

From 2003 to 2008, the major change observed in terms of the largest employers was the large increase in oil and gas/mining jobs in the Permian Basin, accounting for about one third of all jobs created over the period. This increase drove the oil and gas/mining sector to displace manufacturing as the 4th largest industry in the area.

	Sector		Number of Employees				
2003	NAICS	Description	Concho Valley	Permian Basin	South Plains	West Central	64 Counties
1	62	Health Care and Social Assistance	7,181	17,740	22,335	20,348	67,604
2	44	Retail Trade	7,014	18,053	20,132	15,124	60,323
3	72	Services	5,004	11,681	14,070	8,493	39,248
4	31	Manufacturing	4,431	7,110	10,004	9,811	31,356
5	81	Other Services	2,342	7,403	8,096	5,926	23,767
6	23	Construction	2,291	8,889	6,358	6,013	23,551
7	42	Wholesale Trade Administrative and Support	1,509	6,91 <i>7</i>	7,448	3,884	19,758
8	56	Services	2,101	4,377	7,858	4,503	18,839
9	21	Oil and Gas/Mining	1,519	11,539	1,678	2,608	17,344
10	52	Finance and Insurance	1,945	4,158	5,920	4,525	16,548

Top Ten Sectors by Employment: 2003-2008

00 Grand Total

41,344 115,421 124,211 93,507 374,483

2008	NAICS	Description	Concho Valley	Permian Basin	South Plains	West Central	64 Counties
1	62	Health Care and Social Assistance	7,488	18,319	24,255	18,621	68,683
2	44	Retail Trade	7,894	19,472	22,422	16,079	65,867
3	72	Services	5,676	14,226	16,774	10,353	47,029
4	21	Oil and Gas/Mining	2,132	23,716	2,036	4,755	32,639
5	31	Manufacturing	3,560	8,077	8,647	8,665	28,949
6	23	Construction	2,921	11,777	6,452	5,918	27,068
7	81	Other Services	2,374	8,172	7,379	5,214	23,139
8	42	Wholesale Trade	1,288	9,672	7,857	3,813	22,630
9	56	Services	2,913	4,877	8,078	2,734	18,602
10	52	Finance and Insurance	1,585	4,876	5,909	4,547	16,917
	00	Grand Total	43,693	144,454	124,615	93,722	406,484

Source, US Census Bureau County Business Patterns, 2003 and 2008, 2-digit NAICS (2007)

In terms of growth, the information sector grew at the highest average rate, although this was driven by large increases in two Workforce Development Areas. Although Manufacturing fell a rank in terms of its share of overall employment, it showed growth across all four regions and produced the second-highest job growth over all four regions.

	Sector		Growth				
Rank	NAICS	Description	Concho Valley	Permian Basin	South Plains	West Central	64 Counties
1	51—	Information	971%	107%	-84%	-33%	24%
2	31—	Manufacturing	52%	9%	7%	46%	22%
3	42—	Wholesale Trade	-39%	121%	0%	-15%	20%
4	72—	Services	13%	22%	19%	22%	20%
5	48—	Transportation and Warehousing	-29%	15%	8%	76%	19%
6	81—	Other Services	57%	18%	-1%	34%	17%
7	23—	Construction	27%	32%	1%	-2%	15%
8	44—	Retail Trade	13%	8%	11%	6%	9%
9	56—	Services	92%	-58%	381%	5%	7%
10 (11)	54— 21—	Professional, Scientific, and Technical Services Oil and Gas/Mining	-42% -52%	100% 234%	-28% -80%	24% -52%	6% 4%

Top Ten Sectors by Employment Growth, 2003-2008

Source: Ibid.

"GREEN-RELATED" INDUSTRY ANALYSIS

While we have quantified and located the wind energy industry in terms of generation, there is little information on its economic size.

Tracking the size of the clean energy economy is a difficult task. According to information from the Bureau of Labor Statistics (BLS) and an interview with Texas Workforce Commission data experts conducted by Grissom and Associates, the current system used to track economic activity by sector. The North American Industrial Classification System or NAICS does not contain a separate category for "green" business even at the highest level of detail (6-digit).¹

The only readily available source of NAICS data at the highest available level of detail (6-digit) that also allows regional analysis is the US Census Bureau's County Business Patterns survey. This survey collects information on the number of businesses in each NAICS category.

The task of analysis is further complicated by the tendency of green activity to span multiple existing NAICS categories, and for firms to engage in some "green" and some "non-green" activities. For example, a residential contractor who installs heating, cooling and ventilation systems may upgrade a home to a more efficient system, which most would consider a green activity. However, the same contractor may the next day install a less-efficient system or one that is more efficient but uses more energy on balance due to increased capacity, in which case the activity's net environmental impact is negative.

While the BLS and other researchers are working to create a solution to this issue (efforts can be tracked at http://www.bls.gov/green), no satisfactory list currently exists. To overcome this issue, Grissom and Associates consulted several sources: the four major sources were the BLS's working list of "primary" industries, an Angelou Economics study on the Green Economy in Austin and a wind industry supply chain study conducted by the University of Illinois. The Angelou Economics list provided a good starting point but was not inclusive enough regarding the wind industry. The BLS list was too inclusive and included many industries who had tenuous connections to clean energy, but using the "primary" industries added depth to the list.² The list assembled from these sources is below, including detail on the industry's relationship to the green economy.

Renewable-related NAICS (2007) List

Code	NAICS Title
221119	Other Electric Power Generation
221121	Electric Bulk Power Transmission and Control
221122	Electric Power Distribution
237130	Power and Communication Line / Structures Construction
237990	Other heavy construction
238290	Other building and specialty contractors
541330	Engineering Services
541370	Other surveying and mapping services
541380	Testing Laboratories
541620	Environmental Consulting Services
541690	Other Scientific and Technical Consulting Services
562213	Solid waste combustors and incinerators
326199	Other Plastic Products Manufacturing
331510	Iron Forging
	~ ~

Renewable Energy Connection Operations and Maintenance Operations and Maintenance Operations and Maintenance Operations and Maintenance Construction Construction Construction Consulting and technical assistance Supply Chain (Wind) Supply Chain (Wind)

332991	Ball and Roller Bearing Manufacturing	Supply Chain (Wind)
333412	Industrial and Commercial Fan Manufacturing	Supply Chain (Wind)
333414	Heating Equipment (except Warm Air Furnaces) Manufacturing	Supply Chain (Solar)
333611	Turbine and Turbine Generator Set Units Manufacturing	Supply Chain (Wind)
333612	Speed Changer, Industrial High-Speed Drive, and Gear Manufacturing	Supply Chain (Wind)
333613	Power Transmission Equipment	Supply Chain (Wind)
334413	Semiconductor and Related Device Manufacturing	Supply Chain (Solar)
334418	Printed Circuits and Electronic Assemblies Manufacturing	Supply Chain (Wind)
334519	Measuring and Controlling Device Manufacturing	Supply Chain (Wind)
335312	Motor and Generator Manufacturing All Other Miscellaneous Electrical Equipment and Component	Supply Chain (Wind)
335999	Manufacturing	Other Solar/Wind Components
423690	Other Electronic Parts and Equipment Merchant Wholesalers Plumbing and Heating Equipment and Supplies (Hydroids) Merchant	Sell Related Equipment
423720	Wholesalers	Sell Related Equipment

These NAICS codes likely capture the growth of the green economy, but they also capture some non-related activity, and so lack specificity. Regardless of these limitations, the list still allows us to determine a very rough idea of the industry's scale, and also indicates in some instances businesses that could serve a developing clean energy sector, even if they are not primarily clean energy-related businesses.

Number of Businesses	2003	2004	2005	2006	2007	2008	Percent Growth
64-County Region							
"Green-related" industries	608	602	617	631	658	663	9.05%
All Industries	28,604	28,636	28,710	29,241	29,501	29,509	3.16%
Percent of Total	2.13%	2.10%	2.15%	2.16%	2.23%	2.25%	
State of Texas							
Texas "Green- Related"	11,926	11,989	12,141	12,366	12,665	12,847	7.93%
Texas Total	483,945	491,092	497,758	509,080	521,408	522,336	7.72%
Percent of Texas Total	2.46%	2.44%	2.44%	2.43%	2.43%	2.46%	
Employment	2003	2004	2005	2006	2007	2008	
64-County Region							
"Green-related" industries	3,020	2,752	2,617	2,978	3,643	4,062	34.50%
All Industries	360,074	366,804	365,079	382,401	398,122	411,411	14.26%
Percent of Total State of Texas	0.84%	0.75%	0.72%	0.78%	0.92%	0.99%	
Texas "Green- Related"	256,525	250,842	253,382	272,935	295,953	340,528	32.75%
Texas Total	14,328,507	14,879,085	15,966,800	18,434,417	20,534,420	25,601,690	78.68%
Percent of Texas Total	1.79%	1.69%	1.59%	1.48%	1.44%	1.33%	
Annual Payroll (\$1000s)	2003	2004	2005	2006	2007	2008	

64-County Region							
"Green-related" industries	123	111	115	140	191	244	98.85%
All Industries	9287	9841	10427	11540	12698	14356	54.58%
Percent of Total State of Texas	1.32%	1.13%	1.10%	1.21%	1.51%	1.70%	
Texas "Green- Related"	8,051	8,118	8,305	8,711	9,041	9,232	14.67%
Texas Total Percent of Texas	281,636	293,573	315,809	347,736	373,037	394,696	40.14%
Iotal 2.86% 2.77% 2.63% 2.51% 2.42% 2.34% Source: US Census County Business Patterns Survey							

While the above may not comprise a comprehensive list of green industries, this list does appear to be a bright spot for the West Texas Economy. These industries all grew in terms of the number of businesses, the number of employees and the annual payroll across the four Workforce Board Areas. They also grew at a higher rate than the overall rate of industrial growth in these categories, and increased their share of the economy. This trend was the opposite for the rest of the state: industries in the "green-related" list used above grew at a slower rate and decreased their share of the state's economy.

SUMMARY OF REPORTS

Over the course of this study, focus groups and regional meetings were held with representatives from the four workforce board areas discussing renewable energy issues relating to workforce, economic development, education and collaboration. Survey were conducted on several issues and five reports were provided to the West Texas Rural Workforce Network as resource materials for the development of a regional collaborative plan to drive renewable energy development and renewable energy jobs in West Texas.

Project Chronology

- April 12: Project kickoff meeting/Focus group - Abilene
- June: Report #1-Surveyed building codes, existing renewable installations, installer credentials required, utility providers and concerns
- August: Report #2 Surveyed workforce capacity, training needs for industry
- August: Focus groups in Lubbock and San Angelo
- November: Report #3 Surveyed financial incentives and loan programs for renewable energy
- November: Regional meeting of energy regulators and developers-Abilene
- December: Regional meeting of State Agencies and Legislators-Abilene
- January: Report #4 Surveyed educational capacity and training needs for local government officials
- February: Report #5 Surveyed community attitudes and perception and available educational resources

The primary objectives of these reports were to assess the current level of resources (i.e. economic, educational, labor, and natural/physical) and to map the relationships and forces that drive or hinder the development of the renewable energy industry in the West Texas region.

The five reports covered the following topics:

- State of Renewable Energy Industry in the West Texas Region – Provides an overview of the current state of the renewable energy industry in West Texas including regional surveys of building codes and regulations for renewable energy installations, existing renewable energy power generation installations, credentials required for renewable energy technology installers, incentives offered by electric utilities, and renewable energy technology interconnection requirements.
- 2. Assessment of Regional Renewable Energy Workforce – Analyzes the current renewable energy workforce capacity and identifies training needs to meet future demand for renewable energy development in the West Texas region.
- Assessment of Regional Financial Support for Renewable Energy – Surveys recent and existing financial incentives and loan programs for renewable energy development in the West Texas region.
- 4. Assessment of Regional Educational Support for Renewable Energy Development – Surveys educational support for renewable energy workforce development at the secondary and post-secondary levels and identifies training needs for local governments. Also, surveyed were the local/county governments training needs as it relates to renewable energy.
- 5. Survey of Community Attitudes and Community Education on Renewable Energy – Presents and analyzes results from a survey of West Texas citizens

on community attitudes and perception on renewable energy.

Report #1 – State of Renewable Energy Industry in the West Texas Region

The first report provided to the West Texas Rural Workforce Network describes the current state of the renewable energy industry in West Texas and begins to identify the relationships and forces that drive or hinder the development of the industry in this region. Almost all of the renewable energy currently installed in West Texas is located on large wind farms. These wind farms have been developed by large companies on vast parcels of land that exhibit favorable conditions for generating power from wind. As of 2011, almost 10,000 megawatts (MW) of installed wind power generation capacity exists in Texas, primarily located in West Texas. This is enough capacity to power about 2.4 million homes when operating at full capacity (when the wind is strong and no congestion exists on the grid). It is expected that wind farms will continue to be developed in West Texas as Texas is currently undergoing major transmission line construction to bring renewable power generation to population centers in Central, North, and Southeast Texas in support of the identified Competitive Renewable Energy Zones (CREZ) in West Texas. Future wind development may also be influenced by whether federal tax incentives for wind development continue.

While large-scale wind power development has been a success story in West Texas, no utility-scale solar or geothermal plants currently exist despite the vast potential of these resources. Additionally, few renewable technology systems located at the customer premise (such as solar photovoltaic [PV] systems) are currently installed on homes and buildings in the West Texas region. Since there is a large potential for development of these resources in the West Texas region, promotion of these types of systems through financial incentives and education appears warranted.

The primary driver of renewable energy development in West Texas has been the economics of wind power development which is influenced by resource availability, the price of natural gas, wholesale power prices, financial incentives provided at the federal level, and state policies supporting wind development. Building codes and development regulations have not played a significant role in renewable energy development in West Texas. The development of local building codes that encourage energy efficiency improvements and installation of solar PV systems and other forms of distributed generation on homes and buildings could help promote regional investment in these technologies.

A survey of credentials for renewable energy technology installers in Texas found that requirements currently exist for installing smallscale solar and wind systems. The North American Board of Certified Energy Practitioners (NABCEP) is the certification agency for installers of renewable energy systems. Licensed master electricians through a licensed electrical contractor must install these systems. Therefore, training licensed electricians will be critical for promoting the development of distributed generation in West Texas.

A survey was also completed to identify requirements for connecting renewable energy systems to the electric grid and financial incentives for installing these systems currently provided by regional electric utilities. Several electric utilities provide service in the West Texas region. Many of these utilities offer financial incentives for renewable energy installations and energy efficiency improvement and support job training and employment opportunities and economic development programs. Customers must follow the interconnection requirements set by the electric utility and regulated by the State. Understanding these requirements and establishing relationships with electric utilities in the region can help develop the renewable energy industry in West Texas by increasing the amount of renewable energy generated at the customer premise.

Report #1 Conclusions:

- Building codes and development regulations are not playing a significant role in either promoting or hindering the installation of renewable energy systems in West Texas.
- Renewable energy has and will continue to be a key driver of the economy in the West Texas region due to the presence of favorable natural and geographic conditions that make renewable energy development financially attractive in the region as well as state and federal policies that support renewable energy development.
- Requirements for renewable energy technology installers in West Texas are established. The greatest current labor need to support renewable energy development in this region is for licensed electricians.
- 4. It is anticipated that local utilities will continue to provide financial incentives for energy efficiency and solar energy development while local and state policies will continue to develop requirements to improve building efficiency, further driving clean energy development in West Texas.

Report #2 – Assessment of Regional Renewable Energy Workforce Needs

The second report provided to the West Texas Rural Workforce Network assesses the current and projected renewable energy workforce capacity in West Texas and identifies training needs for incumbent and new employees in the regional renewable energy industry. The report includes results from focus groups, individual interviews, and online surveys of renewable energy developers and employers, workforce board employees, and other business that may provide services or promote renewable energy development. Also, quantitative data was collected at the local, state, and national levels on the regional renewable energy industry.

Energy consumption is projected to increase 17 percent by 2025. This increase in energy demand, along with increased interest in and incentives for clean energy development, suggests that renewable energy industry workforce capacity needs will increase in West Texas over the next several decades. The West Texas region currently plays a major role in the state and national energy sector with large concentrations of employment in the oil and gas industry. The skills needed for the traditional energy industry are similar to those needed in the renewable energy industry. This creates opportunities for employees to shift from one industry to the other. Attached to the report is a listing of the fastest growing occupations in the renewable energy industry. Specific skills or jobs that are most sought after in the renewable energy industry area are installation, electrical, construction, plumbers, mechanical skills, manufacturing and assembly, design, and electrical and mechanical engineering.

Employers recognize the need for workforce development in the renewable energy industry. Based on a comprehensive survey of employers, 72 percent anticipate increasing the number of jobs in renewable energy in the next five years while 78 percent feel there is an insufficient pool of employees in the renewable energy field in specific industry areas. Those surveyed generally agree that applicants need a wider range of basic and soft skills and more hands on training to be effective in the industry. While a degree or certification is considered important, employers feel this does not fully prepare employees to work in the industry.

The primary observation made from the data related to training needs is that while job training does currently exist in West Texas there is still great need to continue developing and marketing these workforce programs to employers and potential employees. Currently, only 50 percent of employers utilize these types of programs.

Report #2 Conclusions:

- Texas is a national leader in renewable resource development, particularly wind energy development, and has the appropriate natural resources and geographic conditions to continue in this role.
- 2. The renewable energy workforce requires a diverse set of skills and educational needs. Without support, the West Texas region will not be prepared for projected growth in the renewable energy industry.
- 3. The economic vitality of the West Texas region will depend greatly on its ability to attract, retain, and develop a skilled and versatile renewable energy workforce.
- 4. Opportunities exist in expanding renewable energy training and education programs and improving communication among renewable energy developers, economic development organizations, and educational entities.

Report #3 – Assessment of Regional Financial Support for Renewable Energy

The third report provided to the West Texas Rural Workforce Network assesses the impact of financial support for renewable energy in the West Texas region and identifies opportunities for promoting renewable energy development through financial support. Several state and federal loan programs currently exist for financing large-scale renewable energy projects, but many of these programs are not currently accepting applications and most are focused on providing loans to commercial and governmental institutions. It is not expected that these programs will be a major driver of renewable energy development in West Texas in the short-term. However, state and federal programs may be a future source of financial support for renewable energy development and should be closely monitored.

Electric utilities play a key role in financing clean energy in Texas. Most financial incentives, typically in the form of rebates, currently offered by electric utilities are for making home and building energy efficiency improvements. Many electric utilities also offer incentives and/or financing assistance to install renewable energy systems, primarily solar PV systems. Utilities that currently offer incentives for small distributed renewable generation systems (solar PV) are AEP (Texas North, Texas Central, and SWEPCO), Entergy, Texas-New Mexico Power, and Oncor Electric Service Delivery. The federal government also provides a tax credit for the installation of solar PV systems. A summary of clean energy programs offered by utilities located in the West Texas region is included in the report. Under-participation in existing clean energy programs in the West Texas region indicates that while large-scale wind generation has excelled in West Texas, interest in clean energy at the customer level is lower than other parts of the State. This suggests that education on the financial benefits of clean energy may improve participation in these programs and interest in installing renewable distributed generation systems.

Report #3 Conclusions:

1. Loans are not likely to provide a major source of renewable energy

development activity in the West Texas region.

- Utility-funded rebates and federal tax incentives are spurring solar photovoltaic development in other areas of Texas.
- West Texas residential homeowners and commercial building owners have relatively low participation in currently available financial incentive programs to support energy efficiency improvements and renewable energy installations.
- Electric utilities play a key role in providing incentives and financing energy efficiency improvements and renewable energy installations.

Report #4 – Assessment of Regional Educational Support for Renewable Energy Development

The fourth report provided to the West Texas Rural Workforce Network assesses the current state of educational support for the renewable energy industry in the West Texas region and identifies training needs for local governments. Data was collected from independent school districts, proprietary schools, community colleges, and universities to identify existing resources for renewable energy education and future educational needs and opportunities. Universities in West Texas offer a wide range of basic and advanced courses at the bachelor's degree level and higher to prepare students to work in this industry. More than half of the region's community colleges and technical colleges offer a two-year degree or certificate program to prepare students for jobs in the renewable energy industry. Many colleges offer specialty degrees or apprenticeship programs designed to fill specific job niches in the industry. A list of degrees and specialty programs related to the renewable energy industry offered at universities and colleges in West Texas is included in the appendix –Report #4. These educational institutions are a valuable

resource for developing continuing education courses to meet changing industry needs.

Educational institutions in West Texas were surveyed to determine what current educational resources exist and identify future resource needs.



Opportunities exist for improved collaboration among independent school districts and community colleges to coordinate dual credit courses and alignment of curriculum and promote training and employment in the renewable energy sector. The Texas Renewable Energy Education Consortium is a group of Texas colleges that investigate, develop, and teach curricula dedicated to post-secondary education in emerging technologies to meet the demand of the Texas Workforce. This group provides a valuable resource for developing the educational support system needed to foster the renewable energy industry in West Texas.

A survey of local government officials at the city and county level was conducted to investigate educational resource needs for code officials. This survey found that while permits tend to be required for solar installations on homes and businesses, no cities or counties offer training to city or county officials or knew if they had participated in any training related to renewable energy. When asked if training would be beneficial to the city or county staff, respondents had little interest. A list of publications related to solar PV development in local communities and a listing of workshops and conferences for code officials is included in the report to serve as resources for training at the local level.

Report #4 Conclusions:

- 1. Many educational institutions in West Texas offer basic and advanced renewable energy-related courses to help meet workforce development needs in the region. However, a gap exists in training certain skills due to inadequate funding and lack of faculty.
- 2. There appears to be a gap between the independent school districts and community colleges in offering dual credit courses. A stronger partnership among these educational institutions is needed to offer and promote dual credit courses.
- 3. The regional workforce boards, community colleges, and universities have a strong working relationship for coordinating training needs for the renewable energy industry and other industries in the West Texas region.
- There is a strong need for qualified employees in the renewable energy job sector in the West Texas region. Individuals who complete renewable energy courses have an almost 100 percent placement rate with renewable energy employers.
- Opportunities exist for all educational institutions to provide continuing education training to support the renewable energy industry. West Texas has the appropriate conditions to become a leading educational hub for such training.
- 6. On-going collaboration among educational institutions must increase in order for the West Texas region to

continue to be leader in renewable energy development.

Report #5 – Survey of Community Attitudes on Renewable Energy

The fifth report provided to the West Texas Rural Workforce Network presented the results of a survey of West Texas citizens on attitudes and perception of renewable energy. Over a hundred respondents completed the survey, representing a broad range of demographics in terms of location, age, and education. Questions were asked regarding attitudes on renewable energy and perception and awareness of renewable energy issues.

Interest in renewable energy investment among respondents was high with 73 percent of respondents answering that personal investment in renewable energy is important or very important and 74 percent of respondents answering that city and county investment in renewable energy is important or very important.



However, the majority of respondents were not willing to pay higher city and county taxes (69 percent) or higher state taxes (59 percent) to support renewable energy development and only 22 percent of respondents were willing to pay higher utility rates for renewable energy.

Several questions were asked related to perception and awareness of energy efficiency technologies and programs, renewable energy technologies, programs, and issues, and the concept of "green" energy. Results indicate a high level of awareness and interest in wind energy in West Texas, reflecting the high visibility of wind turbines in the region, but less interest in other renewable energy technologies. The survey results suggest that there is growing awareness and interest in electric vehicles and solar energy as well. Respondents were generally unaware of existing energy efficiency and renewable energy rebate or other incentive programs, with only 23 percent of respondents acknowledging awareness of these programs. The low level of awareness of these programs suggests that greater dissemination of information and spending on marketing these programs is needed in this region. The majority of respondents acquire information about renewable energy from the television and internet, suggesting that these outlets provide the greatest opportunity for promoting energy education and interest in the West Texas region.

Report #5 Conclusions:

- Interest in renewable energy investment is strong in West Texas and is perceived as an opportunity for economic growth. However, there is little support for paying higher taxes or paying more for electricity to promote renewable energy in this region.
- 2. There is a strong awareness of wind energy in West Texas and growing interest and awareness in electric vehicles and solar energy. However, further education and outreach is needed on existing energy efficiency and renewable energy programs in this region.
- There are a multitude of media sources, institutions, and organizations in the region that can be leveraged to promote renewable energy development in West Texas.

COLLABORATION

NEED FOR REGIONAL PERSPECTIVE

The focal point for the collaboration plan should be establishing and maintaining a regional structure for promoting and sustaining collaboration. The specifics detailed below are focused on renewable energy, but they can be easily adapted to any industry area or focus.

In general, the process for building regional collaboration should track as follows:

- Identify the clusters and focused networks where activity is already going on in an active and sustainable way.
- Pick activities and projects that exemplify the types of activities that will drive economic growth in the region.
- For each cluster and network, identify the key elements that are transferable to other areas of the region.
- For each cluster and network identify the key people who are driving that activity, both by name and by position or "type" of role they play in that activity
- Make the activities known in the region and to organize meetings as necessary to disseminate and capitalize on these activities

WEST TEXAS REGIONAL COLLABORATION MEETINGS

In July and August of 2010 were conducted in each of the four workforce board areas. The initial purpose of each meeting was to identify:

- Local and regional partners
- Resources
- Existing collaborative projects that can be connected
- Projects and approaches that are working

• Obstacles to collaboration that need to be overcome

Each meeting was divided into two parts. The purpose of the morning session was to introduce everyone in the workforce board areas to the goals of the regional collaborative project and the benefits to their area. This was both to inform constituents who had likely not heard about the project to begin with and to build support for any ongoing and developing collaborative efforts. It also provided a forum for input from parties who may have not had a chance to offer their opinions and expertise on the topic. Morning session activities included the following:

- Overview of collaborative concept for the region
- Exercise to demonstrate membership in multiple groups and identify resources in the room.
- Tools for organizing/building collaborative networks for renewable energy.

Those invited to the sessions were comprised of the following groups who representing key constituencies related to both renewable energy and regional development:

Workforce Boards

Economic Development Boards/Agencies

Utilities

Energy Industry Companies/Businesses

Chambers of Commerce

Education (School districts, Community Colleges, etc.)

Conservation Groups

Public Sector

Social Services, Citizen/ Community Groups

City/Count governments

Legislators Business Leaders

Council of Governments

The afternoon sessions were designed to engage a more select or "Core Group" of participants. Each "Core Group" was to be identified by their workforce board and include 10-15 members who could take the lead for the project and potentially be the group that would/could convene to solve issues, get the community together to apply for state/federal funds and identify current and needed resources. The primary activities of the Core Group were:

- Map out the assets and projects that the region can build on to advance the local development effort
- Identify gaps in the map (who needs to be included)
- Develop plan for expanding and leveraging network to promote renewable energy in the region and sustaining collaboration
- Identify next steps for the group and regions who could work together.

MEETING OUTCOMES

From a structural standpoint, the meetings provided an important forum for participants to simply meet each other and know more about what each was doing. In addition to orienting people towards that project and providing a framework for collaboration, the meetings were also a catalyst for individuals to connect with each other and identify common interests they may have not otherwise identified. Not all the topics being discussed had directly to do with renewable energy, per se, but they all had to do with common challenges and opportunities for the region.

Importantly, each collaboration meeting relationships particular to that workforce board area that can become a resource for the other Board areas in the region. In Abilene, for example, there was a particularly strong connection between representatives from economic development and workforce development. Similarly, there was strong connection between the educational entities, especially community colleges and technical colleges, and the industries in the area. In Lubbock, there was also strong connection between economic development and workforce, but they had the added connection to state political power. In San Angelo, there was a particularly strong connection between the local businesses and the utilities, and then between these two entities and the local community colleges and training entities. San Angelo also had the added the strength of Small Business Development at Angelo State and the local groups that are revitalizing the downtown area and promoting quality of life. They also had a strong connection to the local rural communities and their interests.

From the standpoint of regional collaboration, each workforce area has created processes of networking and collaboration that can be shared with other workforce areas and they each have particular areas of expertise or resources that can be shared with other workforce areas. For example, a collaboration in which Abilene's success at linking Economic and Workforce development could be joined with Lubbock's political connections and San Angelo's ability to work with outlying rural areas to create a very powerful and successful project that benefits the entire region.

PRIORITIZED ISSUES IDENTIFIED FOR COLLABORATION

In general, groups do not collaborate for the sake of collaboration. They collaborate for specific purposes, in response to particular challenges or opportunities that emerge, at particularly moments in time. This is critical to efforts that promote collaboration, because it easy to come to the conclusion that regions do not want to or are not able to collaborate. Issues become the catalysts and seeds that pull people together to collaborate.

During the course of the meetings in each of the four Workforce Areas, the following issues and potential drivers of collaboration emerged. Different areas placed different emphases on different issues, but each of these issues was present in some form in each region.

• Anticipating/Forecasting changes in the economy and workforce needs

Trying to shorten the lag time between

recognition of workforce/training needs and the development and deployment of programs to meet those needs

Better coordination and information sharing among the different entities that identify and track trends in local, state, national, and global economies

 Assessing the relative "penetration" of renewable energy sources to the general public

Renewable energy is most well developed at the level of utilities and power generation. Residential use of renewable energy (solar, and small wind turbines) is lagging far behind, largely because of:

> Perception that it will take too long to get a return on their investment (when is the breakeven point)

Worries that they can have sustained supply because the wind is variable

Aesthetics—solar panels on top of the house detract from the look of the house

Inability to run the meter backwards—sell excess energy to the utility company

 Cultivating the Public as consumers and political constituents for renewable energy

Consumers are important because they are voters and political constituents. They can influence legislators as to what they will support and policies they will create and implement.

Educating the public makes for better consumers and for better governmental policy, both at the state and federal levels.

 Communicating to the public and political officials the broad impact of the renewable energy industry on the economy in general, beyond the industry specifically

The renewable energy industry extends well beyond power generation and the companies that make wind turbines, for example. Renewable energy industry in West Texas benefits the entire state because vendors and workers come from all over the state.

The skills that are developed to work in the Wind Industry, for example, are transferable to many other industries. This means there's a multiplier effect of all the investment in the renewable energy industry.

• Expanding the conversation about renewable into a broader conversation about energy in general

All energy sectors are completely intertwined and the development of any and all of the energy sectors drive economic development in general

• Giving local educational entities the flexibility to respond most effectively to the needs of their regions

Students and trained workforce for the entire range of people and employees needed for the energy industry – only 1 in 20 need to be professional engineers.

Let ISDs and High Schools in particular have more flexibility to respond to the needs of the local workforce and economy.

One-size fits all policy coming from the state just doesn't serve the needs of local economies or the students. We need to take into account the interests of students and enable them to pursue the things they are interested in (not everybody is able to or interested in going to college). We need flexibility in curriculum designed to fit local needs.

• Develop a Strategic Plan for managing workforce issues in general, whether they directly pertain to Renewable Energy or not. Problem of "right-sizing" and being able to anticipate and meet workforce needs as they constantly shift. Want to be on the "front side of next time" which again requires flexibility.

Need to work closely with industry and government to create standards that will enable greater efficiency in the training and skills development efforts. These standards need to be industry driven and developed, with government support to ensure they are enforced and that there are resources to support training and skills development efforts.

Find ways to bring new workers into the system, rather than a constant number of workers cycling through different industries as the economy continually shifts.

Cultivate the entrepreneurial and new venture creation element of renewable energy

Need to pay close attention to the research component and the different patentable ideas that are generated in and by the industry.

Need to support small business creation and entrepreneurship around these new ideas and technologies that are spinning out of renewable energy, both those that pertain directly to renewable energy and those that may have nothing directly to do with renewable energy.

THE COLLABORATION MODEL

The model for collaboration that has emerged in our research has the following structure:



Current State: Local Collaboration and Area-Specific Strengths

Workforce Development Areas are already collaborating around issues and according to strengths that are particular to their communities and capabilities. They may not define it as collaboration per se, and it is likely to be largely driven by personalities and personal relationships. BUT, it is collaboration nonetheless, and it has a sustainable structure as long as individuals and entities have channels for working together, ready access to knowledge and information, and the ability to identify these.

Each workforce area has resources, infrastructure, and processes that they can share with other workforce areas or provide to those areas in a larger collaborative venture.

Collaborative State: Workforce Areas Collaborate for Regional Development

A regional council identifies opportunities to benefit the region and configures the appropriate entities and resources from each specific workforce area in the region.

The regional council actively cultivates the ability to collaborate by holding regular meetings and providing information to regional partners about trends and opportunities and are likely to impact the region AND resources and processes that can be leveraged to respond to the opportunities.

OBSERVATIONS

Renewable energy comes at two scales:

- Wholesale big wind farms and solar plants
- Retail small scale solar or wind installations on homes and businesses

The drivers of big renewable energy projects include:

- The price of natural gas high price helps renewable energy; low price slows it
- Availability of wind and sun
- State and federal energy policies
- The overall state energy market

 how much will electricity generated by renewable energy sell for?

Renewable and conventional energy are directly linked:

• Jobs, policies, economy all move in similar ways.

West Texas has great success in conventional energy and can build on that for renewable energy. Conventional energy has skills and pathways that can transfer to renewable energy.

Utilities are important players in renewable energy and job creation, e.g., new call centers in Abilene and Lubbock were recently announced by TXU.

State policy makers are interested in renewable energy in West Texas – General Land Office, Comptroller and the Governor's office.

Completion of the CREZ transmission lines is expected to result in the addition of even more large-scale wind and solar generation in the region over the next 10 years.

Electric vehicles could present opportunities for the region: e.g., new automotive training, installation of public charging stations. Federal facilities are required to implement energy efficiency and renewable energy installations where possible, and they could be enlisted as partners in regional energy activities.

RECOMMENDATIONS

A. Establish a Regional Energy Alliance Council (REAC)

The Energy Alliance council would create a group that can leverage those collaborations and mobilize different constituents to pursue opportunities that present themselves. This council will provide leadership and ensure sustained development of renewable energy as a driver for regional workforce and economic development. The Council would serve the following broad functions:

- Enlist a high level group that includes CEOs and decision makers
- Develop and leverage their own networks to promote renewable energy in the region
- Serve as a catalyst for regional efforts in renewable energy
- Serve as a liaison among the regions to facilitate coordination
- Serve as a liaison between the region and state and national entities to facilitate flow of resources and information
- B. Develop a Regional Public Awareness campaign to advertise "West Texas is a key player in renewable energy in Texas, nationally and worldwide"
 - Develop an internet portal to "brand" the region as "energy friendly" and provide alerts for funding opportunities, job fairs, etc.
 - Sponsor an annual "energy

leader" award program that highlights a project or business that has contributed to the region.

- Seek ways to outreach to high schools to raise awareness about renewable energy and energy efficiency.
- Sponsor an annual legislative/policy forum on energy that brings State leaders to the region.
- C. Formalize the Renewable Energy collaborative infrastructure
 - Ensure the following members are represented
 - Workforce Solutions boards
 - Economic development agencies
 - Electric and gas utilities
 - Private energy developers
 - Schools, community colleges and universities
 - Cities and counties
 - Local Community leaders
 - o Media
 - Legislators
 - Institute a collaborative structure that would:
 - Develop priorities and goals Define roles and responsibilities Develop meeting structure Create mission and vision
- D. Establish a regional training program for city/county government, firefighters and city officials to address the new requirements in renewable energy. The training could include:
 - New Energy building code requirements that SECO will be promoting.
 - Solar photovoltaic technologies for firefighters

- Interstate Renewable Energy Council -"Solar Instructor Training"
- E. Identify potential funding sources to sustain a Regional Energy Alliance Council. Sources could include:
 - Texas Workforce Commission
 - Department of Labor
 - State agencies e.g., State Energy Conservation Office
 - Private foundations e.g., The Cynthia and George Mitchell Foundation
 - Regional economic development groups
 - Utility companies
 - US Department of Energy

CONCLUSION

While West Texas is a leader in the renewable energy industry, it must address workforce issues to remain so. The region's economic strength will depend greatly on its ability to attract, retain and develop a skilled and versatile workforce. By collaborating to expand training and education programs, in tandem with effective communication among renewable energy companies, economic development organizations, utilities and educators, West Texas can capitalize on the growth of the most important emerging industry in our country. The time is now to move forward in creating state policies that will meet our power needs and create jobs in this growing energy sector. West Texas should continue its push in renewable energy because renewable energy is putting West Texas on the map as a leader in the energy sector.

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³ US Census Bureau. "Census 2010 Redistricting Data." Interactive Map retrieved 28 Feb 2010

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⁵ BLS's List, a version of which will be used for the 2010 Occupational and Employment Statistics Survey is available online at <u>http://www.bls.gov/green/final_green_def_8</u> 242010_pub.xls

For more information visit www.ruralworkforcenetwork.org

APPENDIX Appendix included on CD file

*REPORTS

- 1. Building Codes, credentials and interconnection requirements
- 2. Workforce needs
- 3. Loans and financial incentives programs
- 4. Educational capacity and local government training needs
- 5. Attitudes and perceptions on Renewable Energy

* West Texas companies and institutions associated with Renewable Energy