Report

Potential Economic Benefits from a Commercial Wind Power Facility in Quay County

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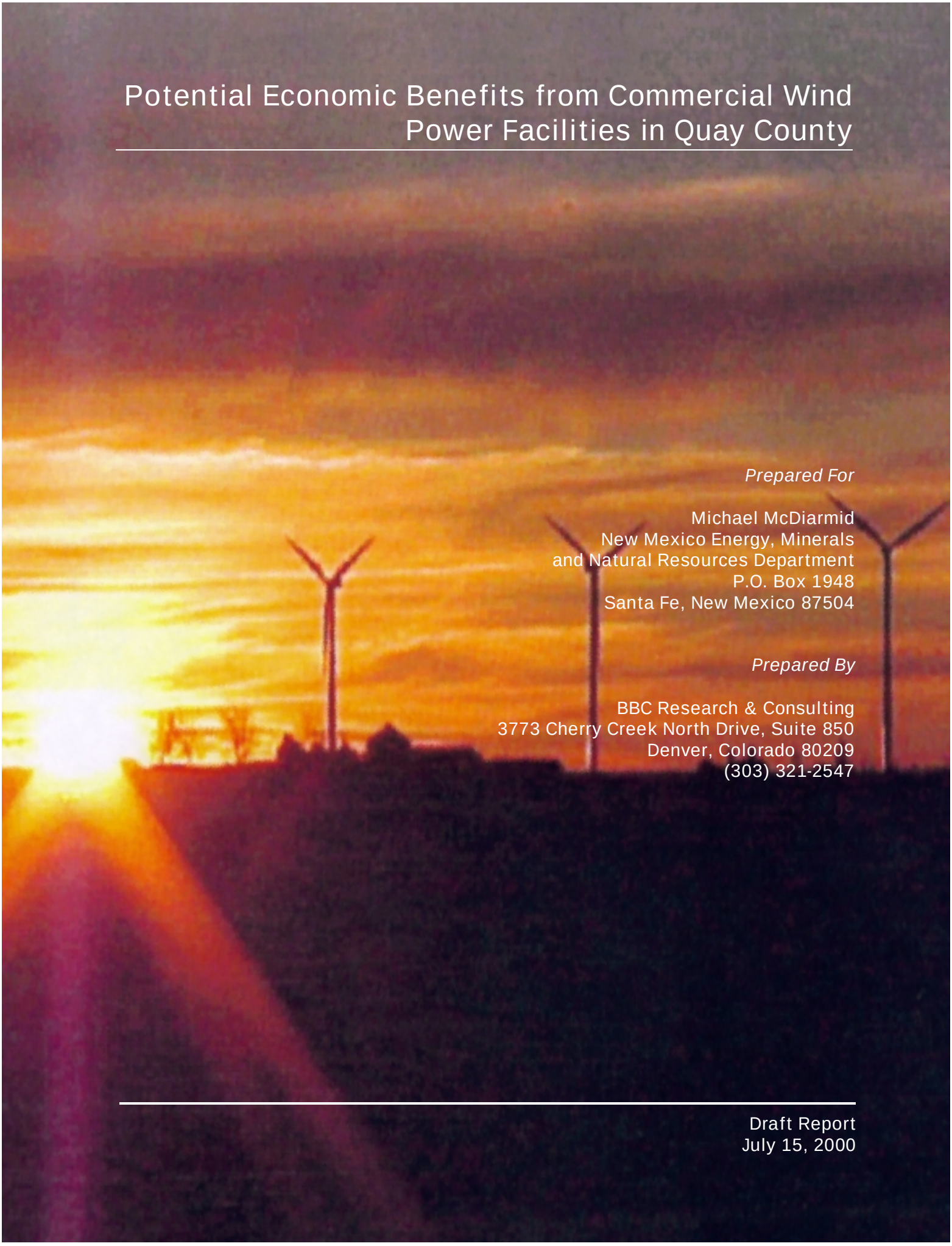

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SECTION I.
Introduction And Background

In late 1999, BBC Research & Consulting (BBC) was retained by the New Mexico Energy, Minerals and Natural Resources Department (NMEMNRD) to examine the potential economic impacts of commercial wind power development at various sites throughout the state. This study represents the latest component of NMEMNRD's effort to examine and encourage commercial wind facility development and follows directly from several previous endeavors.

In 1997, NMEMNRD commissioned the development of a GIS-based wind map of the state of New Mexico, estimating the wind resource for each square kilometer grid throughout the state. Later that year, NMEMNRD followed the initial wind resource mapping project by sponsoring site visits to evaluate the most promising locations. Based upon this work, several candidate sites were prioritized and anemometers were installed to begin developing a dataset on the wind resource in each location in 1999. The same set of candidate sites provide the setting for this study of potential economic benefits.

This report is one of several prepared by BBC for NMEMNRD. Similar reports, focusing on county-level implications of wind facility development, were also prepared to examine sites in Colfax County, Eddy County, Lea County and Otero County. BBC also prepared a separate report, analyzing the economic impacts of wind power development from a statewide perspective.

The report consists of five sections. Following this introduction, Section II provides an overview of wind power development to date throughout the United States and touches on some of the key issues associated with commercial wind power. Section III provides a detailed description of the prototype, 40 megawatt capacity wind facility analyzed in each of the counties. Section IV provides important background information on the economic, demographic and fiscal conditions in each county. Finally, Section V provides a projection of the potential economic and fiscal impacts of construction and operation of the 40 megawatt wind facility on Quay County, an assessment of the significance of these impacts and a comparison of overall costs and benefits from the county's standpoint.

This study could not have been performed without the assistance of many individuals within and outside of New Mexico. BBC was assisted by two other consulting firms in performing this study — Energia Total, located in Albuquerque, New Mexico; and Corona Research, located in Denver, Colorado. BBC received extensive help from various state agencies, including staff of the Department of Revenue and Taxation, Public Service Commission, and Department of Economic Development. We were also greatly assisted by individuals working within the wind power industry, including representatives of Florida Power and Light, Texas Wind Energy, New Century Energies and NEG Micon. Finally, we wish to thank Quay County community leaders, especially Robert Lamb, the Quay County Manager.

While many people contributed to this study, in the end the views expressed herein represent BBC's professional judgment and may not necessarily be consistent with those of any of the entities identified above. Any errors or omissions are also fully our responsibility.

SECTION II.
Overview of Commercial Wind Power Development

This section provides context for the evaluation of potential economic benefits of commercial wind power development in New Mexico by describing commercial wind power development in the United States as a whole, in the largest wind power states and in New Mexico to date. This section also identifies the types of socioeconomic issues that can be associated with commercial wind power development and operation.

Overview of U.S. Wind Development

The use of wind energy has a long history in the United States and construction of small scale windmills, primarily to pump water on farms and other rural locations, dates back at least 150 years. As many as six million windmills and wind turbines have been installed in the Unites States over this long time period.[1]

Commercial wind power development, in which large wind turbines are connected to the electric grid and produce electricity for widespread distribution is, however, a relatively recent phenomenon. During the early 1980s, hundreds of commercial wind turbines were installed in three areas in California — Altamont Pass, near San Francisco; Tehachapi, near Bakersfield and San Gorgonio Pass near Palm Springs. These commercial wind farms were encouraged by substantial state investment tax credits and policy support.[2]

Major policy leverage on behalf of wind power in California ended about 1985 and the pace of commercial wind development throughout the United States slowed. However, in the last few years, there has been a resurgence in commercial wind power development in the U.S. Exhibit II-1 depicts the growth in grid-connected wind energy used for electric generation from 1989-1998. Since 1989, wind energy electricity generation in the U.S. has

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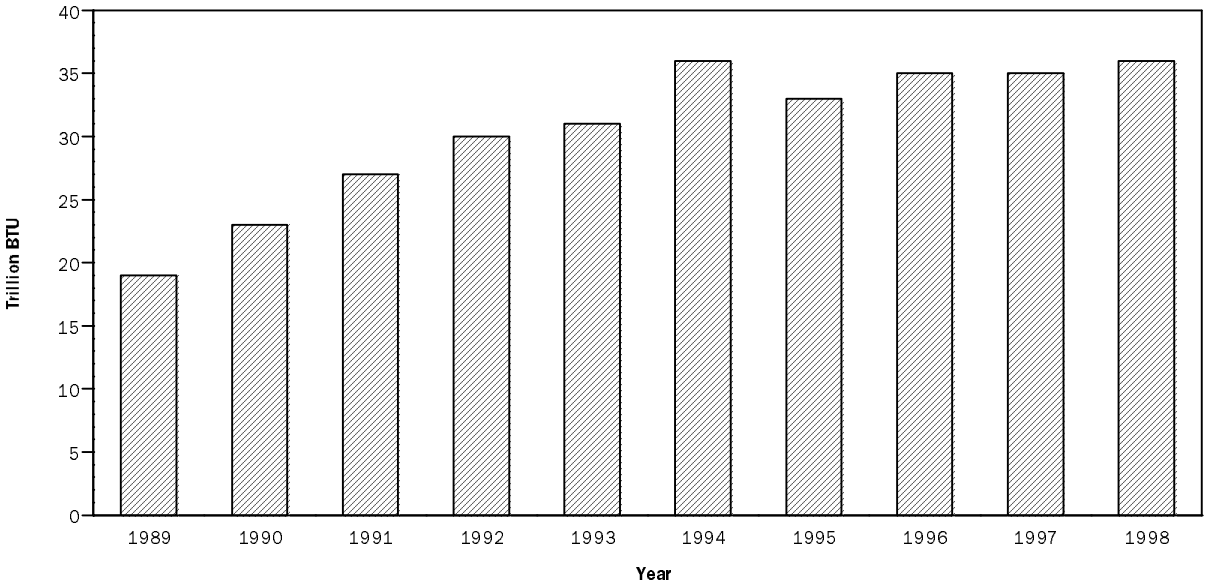
[1] R. Gerald Nix, *Wind Energy as a Significant Source of Electricity*, National Renewable Energy Laboratory, 1995.

[2] Ibid.

increased from approximately 5.6 million megawatt hours per year to approximately 10.6 million megawatt hours per year. In nearly doubling over the past 10 years, wind energy electricity generation in the United States has grown more rapidly than generation by any other renewable source.

Exhibit II-1.
Wind Energy Consumption for Electricity Generation
1989-1998



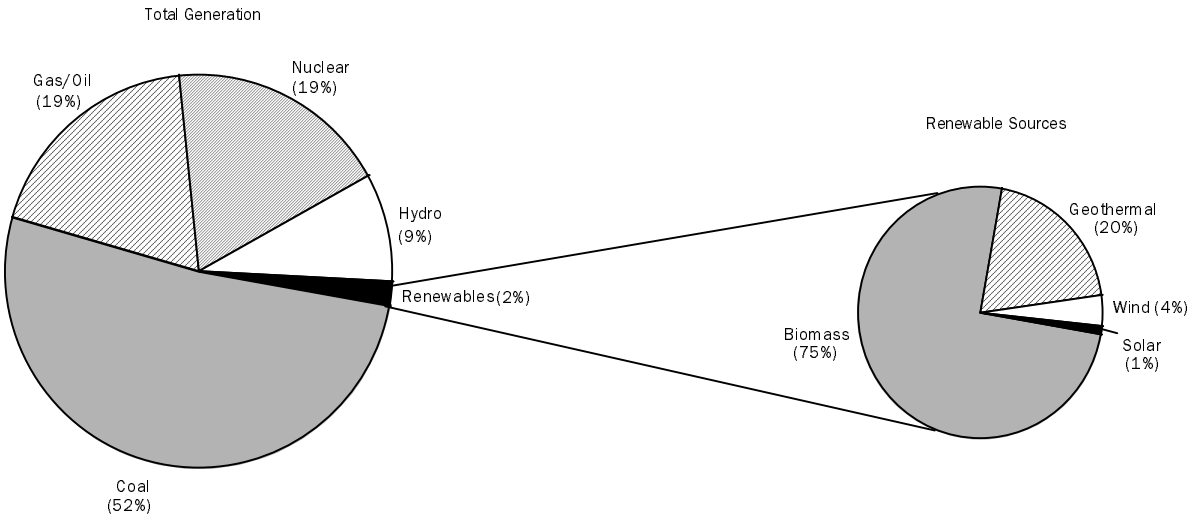
Source: Energy Information Administration Annual Energy Review, 1998.

In 1997, grid-connected wind power facilities generated about 3.4 billion kilowatt hours of electricity. This total is equivalent to the annual electricity use of about 330,000 households — slightly more than all of the households in the Albuquerque Metropolitan Area.[3]

Despite increasing commercial viability, commercial wind energy continues to account for a very small portion of overall U.S. electricity generation. As shown in Exhibit II-2, commercial wind energy generation does account for about four percent of U.S. electricity generation from renewable sources, excluding hydroelectric power, but represents only about one tenth of one percent of total U.S. electric generation.

[3] Calculated from Energy Information Administration, *Renewable Energy Annual 1998* and Energy Information Administration, *Annual Energy Review 1998, End-use Energy Consumption*.

Exhibit II-2.
Sources of U.S. Electricity Generation, 1998



Source: Energy Information Administration, Electric Power Industry Summary Statistics for the United States, 1997 and 1998.

New developments are expected to add considerably to the amount of commercial wind power generation over the next few years. While installed, nameplate capacity of all commercial wind farms in the United States was about 2,400 megawatts fall 1999, new wind developments currently in various stages from proposals to actual construction are expected to add an additional 713 megawatts of nameplate capacity. A large portion of this new capacity is expected to come on-line during year 2000.[4]

Several factors may account for this flurry of current activity:

- improving efficiency of commercial wind developments has reduced the cost per kilowatt hour generated by about 50 percent since the early 1980s[5];

- the federal production tax credit of 1.7 cents per kilowatt hour generated by wind energy that helps make wind energy financially competitive with conventional sources is scheduled to sunset at the end of year 2001[6];

- growing interest in "green power", coupled with the ability of consumers to choose their electricity sources in a deregulating industry and state-specific renewable energy policies in light of deregulation; and

- a proactive posture recently adopted by the U.S. Department of Energy in its *Wind Powering America* initiative that calls for meeting goals of 5,000 installed megawatts of wind capacity by year 2005, 10,000 megawatts by year 2010 and

[4] American Wind Energy Association *Wind Project Database.*

[5] Leif Anderson, NEG Micon, interview on January 23, 2000.

[6] The production tax credit will apply to any project that is in the development stage prior to the end of 2001 and is applicable throughout the operating life of the project.

reliance on wind for at least five percent of U.S. electricity by year 2020. This initiative also calls for federal facilities to take the lead in purchasing wind power.[7]

Most U.S. wind farms are not owned by electric utilities. Instead, corporate developers typically invest in development and ownership of the wind facility and sell power to utilities under long-term, power purchase agreements. The largest wind developer/owner in the U.S. is FPL Energy — a non-regulated subsidiary of Florida Power and Light. The U.S. model of corporate development and ownership contrasts with the approach frequently found in Denmark and other northern European countries where wind farms are often owned by cooperatives or groups of individual owners.

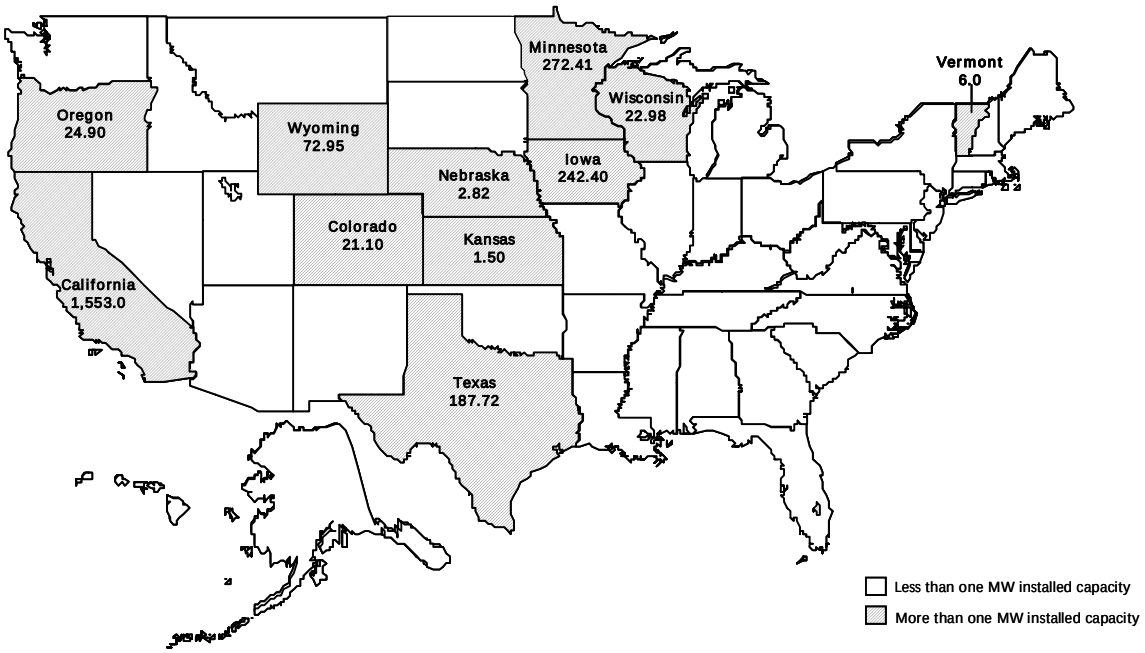
When commercial wind power development began in earnest during the 1980s in California, the manufacturing and technical side of the industry was dominated by European firms — particularly Danish corporations. However, with the growing number of wind developments in the U.S., domestic technical expertise and manufacturing capabilities have also been developed. An American company, ENRON, is now one of the world's ten largest manufacturers of commercial wind equipment. One of the leading Danish firms, NEG Micon, recently opened U.S. manufacturing centers to build turbines in Illinois and nacelles in North Dakota. Substantial U.S. infrastructure support businesses are located near the major wind sites in California and there is a developing wind support sector in Carlsbad, New Mexico — largely focused on maintaining and servicing wind developments in Texas.

Wind Development at the State Level

Commercial wind power development in the United States is presently concentrated primarily in the western and central United States. Exhibit II-3 depicts the total installed wind power generation capacity by state as of late 1999. Eleven states have installed wind capacity of at least one megawatt, while four states — California, Minnesota, Iowa and Texas — have installed capacity of more than one hundred megawatts each.

[7] U.S. Department of Energy News, *Richardson Unveils National Wind Energy Initiative*, June 21, 1999.

Exhibit II-3.
Total Installed Wind Capacity by State
(Nameplate Capacity)



The concentrated development of most commercial wind power within a relatively small number of states is not entirely due to a preponderance of good wind sites in those states. While California has far and away the most installed wind energy capacity, the state ranks only 17th in terms of potential wind resources — with a theoretical ultimate annual wind energy potential of 59 billion kilowatt hours. Minnesota, Iowa and Texas rank 9th, 10th and 2nd, respectively, among U.S. states in ultimate wind potential. New Mexico, with a theoretical annual wind energy potential of 435 billion kilowatt hours far exceeds California in terms of pure wind resource potential.[8]

Instead, the prevalence of wind developments within selected states also largely reflects state policies designed to encourage wind development and to tip the economic balance toward financial feasibility. The following is a description of the policies that have assisted wind development in California, Minnesota, Iowa and Texas.

California. In 1977-1978 California instigated the California Wind Energy Commission Wind Program. This program was designed to encourage the development of commercial scale wind power in the state and included state tax credits to complement then existing federal tax credits and requirements that utilities be willing to enter into long-term interim standard offer contracts. These contracts provided favorable rates based on

[8] Pacific Northwest Laboratory, *An Assessment of the Available Windy Land Area and Wind Energy Potential in the Contiguous United States*, 1991.

projections of avoided costs of generation from other sources. Many contracts were based on forecasts made in 1983 that began at 5 cents per kilowatt hour and ramped up to 14 cents per kilowatt hour by 1997.

In recent years, there has been relatively little new wind project development in California. However, many of the facilities originally developed during the 1980s have been, or are now being, "repowered" to take advantage of improvements in turbine efficiency and economics over the past 15 years.[9]

Minnesota. Policies encouraging renewable energy development in Minnesota came about during the early 1990s as a negotiated compromise on waste disposal issues facing the state's largest electric utility. Northern States Power was allowed to build temporary storage facilities to house nuclear waste at its Prairie Island Plant — in exchange for a commitment to develop at least 425 megawatts of wind energy and 125 megawatts of biomass generated electricity. Additional terms of this agreement may ultimately require up to 400 more megawatts of installed wind capacity, depending on economic considerations.[10]

In an earlier effort to stimulate wind development in Minnesota, the state legislature had exempted wind developments on agricultural land from paying property taxes. While this policy may have encouraged wind developers, it has also had some unintended consequences for local governments in wind energy development areas. The property tax exemption has taken away much of the fiscal benefit from the local counties and, in some cases, reduced their support for wind energy development.[11]

Iowa. Iowa, ranked third among US states in commercial wind energy development, was one of the first states to pass laws setting a portfolio requirement for renewable energy. Under the Alternate Energy Production Law, originally passed in 1983 and revised in 1991, investor owned utilities (IOUs) in Iowa must purchase a minimum of 105 average megawatts from renewable sources. While this energy can be purchased from any type of renewable source, wind has proven to be the resource of choice for Iowa IOUs.

Texas. While Texas ranks fourth among US states in installed wind capacity, it is one of the leading states in new wind energy development. During 1999, over 136 megawatts of wind energy capacity were added in Texas.

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[9] California Energy Commission, *Wind Project Performance 1995 Summary*, June 1997.

[10] Union of Concerned Scientists, *Matrix on State and Federal Renewable Energy Policies*, June 29, 1998.

[11] Conversation with Vince Robinson, Lincoln County Minnesota Economic Development, March 2000.

In part, the strong growth in Texas wind energy development may be attributed to at least three factors. State legislation moving toward retail electric competition in Texas features the strongest renewables portfolio requirement in the US — requiring 2000 megawatts of renewable generation by year 2009. Second, consumer polls sponsored by Texas utilities have shown a strong customer preference for renewable generation. Finally, recently enacted rules of the Public Utilities Commission of Texas have made considerable strides to simplify and improve access to transmission for wind generators.[12]

Recent commercial wind developments in southwest Texas have also spurred economic activity in southeastern New Mexico. In particular, a number of firms in Carlsbad, New Mexico, are active in servicing and provisioning Texas wind sites.

Wind Power in New Mexico

Wind water pumping systems are a common site in rural New Mexico with over 15,000 units recorded in 1976.[13] Enactment of the Public Regulatory Policies Act of 1978 spurred interest in wind electric systems. By 1981, several off-grid wind electricity generators were operating in New Mexico including a 10 kW Jacobs unit at the Glenrio rest stop near Tucumcari and a one kW unit was installed at the Luna Vocational Technical Institute in Las Vegas. Also in 1981, the NM Solar Energy Institute installed thirty wind anemometer stations throughout New Mexico.[14]

Two grid-connected wind projects were operating by 1983. A 25 kW Carter unit combined with 100 kW PV was connected to Lea County Electric Cooperative in Lovington. Also a 25 kW unit was connected to Public Service Company of New Mexico's (PNM) distribution system through a 110/220 Vac, three-phase connection associated with a water pump at the Rio Mimbres Country Club in Deming. The site had a measured resource of only 2.8 m/sec average wind speed and average wind energy production was limited to only 1,700 kWh per month (capacity factor of less than 7%). PNM and the New Mexico Solar Energy Institute sponsored the project.

The second notable grid-connected wind turbine project was in Clayton where a small wind turbine was installed and interconnected to the grid. The turbine operated only a short period of time and was dismantled.

An experimental vertical axis wind turbine was installed just northwest of Albuquerque as part of a prototype design later installed in the Palm Springs area. The New Mexico prototype was operated for a short period of time while interconnected to the PNM grid.

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[12] National Wind Coordinating Council, *Case One: Transmission Policy and Pricing in Texas,* Review Draft 2/16/00.

[13] . Kenneth M. Barnett, ***The New Mexico Wind Energy Resource,*** Physical Science Laboratory, New Mexico State University, Las Cruces, NM, prepared for Energy Resources Board, State of New Mexico, February 1, 1977.

[14] . ***New Mexico Solar Energy Institute Annual Report - 1983,*** New Mexico Solar Energy Institute, 1983.

More recently a 660 kW wind turbine was installed near Clovis in eastern New Mexico to provide wholesale power to Southwestern Public Service for resale under a green marketing program entitled *Wind*source. The project was developed in 1999 by Cielo Wind Power of New Mexico through a consortium including Texas Wind Power, a Texas company; Renewable Energy Systems USA, INC., a British company, and; Vestas, a Danish wind turbine manufacturer. Project developers claim that more than $100,000 has been spent with local subcontractors for electrical equipment, communications services, craning, engineering, concrete, reinforcing steel, civil works, and signage.[15]

In 1997, Energy, Minerals and Natural Resources Department of the State of New Mexico (EMNRD) commissioned a detailed wind energy resource map for New Mexico.[16] The Brower study identified 35 specific sites with predicted wind resources between Class 4 and Class 7 (see Exhibit II-4 below) with no siting restrictions (e.g., national parks), reasonable access to a transmission line, and a contiguous area available for utility-scale wind development.

Exhibit II-4.
Wind Power Classes*

	10m		50m	
	Wind Power	Wind Speed	Wind Power	Wind Speed
Wind Class	W/m^2	m/s	W/m^2	m/s
1	0-100	0-4.4	0-200	0-5.6
2	100-150	4.4-5.1	200-300	5.6-6.4
3	150-200	5.1-5.6	300-400	6.4-7.0
4	200-250	5.6-6.0	400-500	7.0-7.5
5	250-300	6.0-6.4	500-600	7.5-8.0
6	300-400	6.4-7.0	600-800	8.0-8.8
7	>400	>7.0	>800	>8.8

(m/s)* 2.24 = MPH

EMNRD then commissioned a second study to review the Brower report and field survey specific sites for wind resource assessment.[17]

[15] . Judith Carroll, ***Media Advisory - June 8, 1999,*** Cielo Wind Power, June 1999.

[16] . Michael Brower, ***New Mexico Wind Resources - A GIS Approach,*** Brower and Company, August 1997.

[17] . Richard L. Simon, ***Potential Wind Energy Monitoring Sites in New Mexico: Results of a Field Trip to Inspect Prospective Sites,*** July 1997.

Based on positive results of the two studies, EMNRD commissioned the installation of six 40-meter anemometer stations throughout New Mexico as presented below. The stations were installed per U-WRAP standard[18] and will complete one year of continuous operation in the Summer of 2000.

Location	Coordinates	County
Guadalupe Mountains	32^0 38.137' North 105^0 14.415' West	Otero County
Tatum	33^0 08.433' North 103^0 09.689' West	Lea County
San Juan Mesa	33^0 55.95' North 103^0 48.20' West	Chaves County
Frio Draw	34^0 39.70' North 103^0 26.9' West	Curry County
Johnson Mesa	36^0 53.981' North 104^0 17.573' West	Colfax County
Mesa Redonda	34^0 57.7' North 103^0 41.6' West	Quay County

While there has been only one large-scale commercial wind turbine erected in New Mexico in recent years, wind energy is already having some economic impact on the state. A number of businesses in the Carlsbad area have become involved in provisioning and servicing commercial wind facilities in Texas. Further, several of the federal installations in New Mexico, including Sandia Laboratories, have expressed interest in buying wind energy generated within the state's boundaries.[19] The Carlsbad firms would appear to be well positioned to service any new commercial wind facilities in New Mexico, particularly any facilities located in the southeastern quadrant of the state.

[18] . Bruce Bailey and Scott McDonald, ***Utility Resource Assessment Program (U*WRAP) Handbook,*** AWS Scientific, 1995.

[19] Conversations with Don Olson, Carlsbad Department of Development, and other members of the Carlsbad, "Wind Win Team," February and March, 2000.

Overview of Socioeconomic Impacts Related to Commercial Wind Power

After more than 15 years of commercial wind power development in the United States, and a longer period of more intensive development in Europe, the types of socioeconomic benefits and costs associated with commercial wind power are fairly well established. The following is a generalized listing of the types of benefits and costs related to wind power development — a detailed assessment of potential socioeconomic impacts associated with wind power in New Mexico is provided later in this report.

Socioeconomic benefits. The benefits of wind power development range from quantifiable economic and financial impacts to effects that may be more intangible. The following are some of the key categories of benefits:

- Landowner revenues
- Site infrastructure development (e.g., roads)
- Construction jobs
- Procurement of local goods and services during construction
- Operation and maintenance jobs
- Procurement of local goods and services during ongoing operation
- Property, sales and income tax revenues
- Reduction in energy imports
- Air quality improvement (relative to fossil fuel sources)
- Community distinction / tourism

Socioeconomic costs. From the standpoint of a local community, or the state in which that community is located, there may also be certain socioeconomic costs — many of which are intangible and depend upon individuals' perspectives.

- Land requirements
- Site infrastructure development (e.g., roads)
- Visual impact
- Noise
- Avian Impacts

The preceding two lists indicate that whether certain impacts are a benefit or a cost often depends on individuals' perspectives. A set of wind towers and turbines that are a community landmark and graceful, technological marvel to some may be seen as an unwanted intrusion on the landscape by others. While surveys have found that most Americans are favorably disposed towards wind power development, similar surveys sometimes find diminished support for wind development close to home. However, residents in communities that already have wind farms are generally more favorable to having a wind development nearby than those who are considering the notion on a more abstract level.[20]

Summary

Commercial, grid-connected wind energy is a growing source of U.S. electricity. Although existing wind farms currently generate sufficient electricity to power the equivalent of all households in the Albuquerque Metropolitan Area, most of the potential for wind energy remains untapped and wind power still represents a very small share of U.S. electric generation. Substantial wind development is underway at present, and future wind development is being encouraged by the U.S. Department of Energy.

Wind farms in the U.S. are presently concentrated in a relatively small number of states, primarily on the West Coast and in the Great Plains. Apart from good wind resources, wind power development in the largest wind states has been fostered by proactive state policies and incentives. To date, there has been relatively little commercial wind energy development in New Mexico, although a single turbine facility was constructed during the summer of 1999. There are New Mexico businesses, especially in the Carlsbad area, that are actively servicing and maintaining wind power installations in other states.

There are a number of socioeconomic benefits and certain potential costs associated with wind power development. These issues are explored at a more detailed and specific level later in this study.

[20] Seffen Damborg and Soren Krohn, *Public Attitudes Towards Wind Power*, Danish Wind Turbine Manufacturers Association, 1998.

SECTION III.
Quay County Prototype Wind Power Facility

This section describes the construction and operational requirements of a prototypical 40 Megawatt (MW) wind power facility in Quay County. The discussion below focuses on aspects of the wind farm associated with local economic and fiscal impacts; specifically, the land, labor and material requirements of the facility and the associated costs and revenues.

In order to provide reasonably specific estimates of potential impacts, an assumption had to be made regarding the size of the wind facilities that might be built in New Mexico. A 40 MW nameplate capacity size was specified by the NMEMNRD for this study and is approximately representative of the average size of all installed facilities in the American Wind Energy Association (AWEA's) wind project database. This size is also common among projects that have been proposed or are currently under construction in the U.S. Of the 38 new projects for which the AWEA states a capacity, 17, or 45 percent, are between 20 and 60 MW in size. Nonetheless, it is possible that the actual facility in Quay County, if ultimately developed, could be substantially larger or smaller than the prototype assumed here. The final section of this report discusses how the estimated impacts might vary if a larger or smaller facility were actually developed.

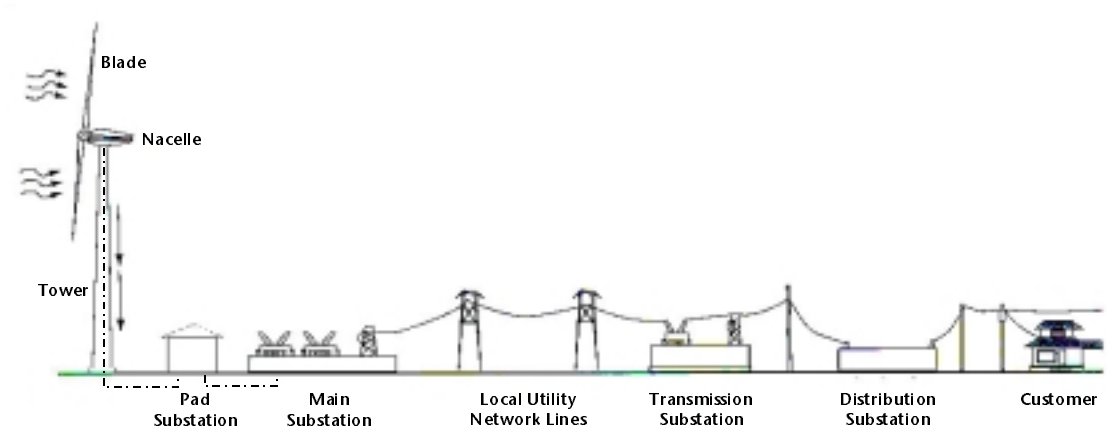
Physical Description of Prototype Facility

The assumed turbine size for the prototype facility is 700 kilowatt (kW), requiring 58 turbines to achieve a nameplate capacity slightly above 40 MW. Several manufacturers, including NEG Mican, Vestas, Enron Zond and others, currently produce turbines between 600 kW and 750 kW. While most manufacturers do not currently produce a 700 kW turbine, this size is representative of commercially popular turbines without being specific to any one manufacturer. Turbines with a capacity of 900 kW to more than 1.5 MW might also be viable for the proposed Quay County site, though these are less commonly installed in the US. Costs per MW of capacity are generally similar even if these larger turbines were installed, though there might be a modest reduction in land requirements and site preparation costs.

Exhibit III-1 illustrates the typical layout of a wind energy generating, transmission and distribution system. A 700 kW wind turbine generator would be housed inside a 10x10x50 foot streamlined enclosure, known as a nacelle. This structure will weigh between 20 and 25 tons and will sit atop a tower that is 164 to 180 feet high. Connected to the nacelles are two or three blades with a length of about 80 feet. The steel tower, typically made in two or three sections, will weigh between 30 and 60 tons and sit on a foundation pad measuring approximately 40 feet by 40 feet. These foundation pads are made of steel and concrete and weigh between 100 and 300 tons, depending upon soil conditions. A transformer will also be located on this foundation pad.

Within the nacelle is a generator that converts the mechanical energy from the rotating blades into electric energy. The electric energy flows through cables inside the tower down to the foundation pad-mounted transformer, which steps up the voltage. The transformer is connected by underground cable to a substation, where the energy is put onto the local utility network lines, also known as the electric power grid. A wind power facility of this size will require a substation within about three to four miles of the turbine field, depending upon technology used by the selected turbine manufacturer. The complexity and cost of the substation depends upon the voltage of the distribution lines. If a new substation is needed, it will be connected to the nearest distribution lines using aboveground wires. The electricity is transmitted across the grid and distributed to customers using a number of substations.

Exhibit III-1.
Wind Energy Generation, Transmission and Distribution System



An onsite computer controls the operation of the turbine through the use of wind monitoring instruments, brakes and a yaw motor. The yaw motor keeps the nacelle facing into the wind and brakes are used to stop the blades' rotation in case of mechanical difficulties or dangerously high wind conditions. Each computer continuously monitors turbine performance and relays information via modem to a central operating facility. Fiber optics lines or cell phone equipment provides the modem to central office link.

In order to maximize turbine efficiency, the rotor blades must have an undisturbed air flow. This is achieved by a minimum spacing of five to seven rotor diameters between units.[1] While a five to seven rotor diameter spacing would suggest a minimum required land area of about 20 acres per turbine, other site-specific siting factors generally drive the land requirements up to 30 to 35 acres per turbine. Given 58 turbines, an estimate of the required land area is 1,750 to 2,000 acres. Of this area, roads and foundation pads will actually cover approximately two percent or about 40 acres. Ranching, farming or other activities are possible on the remainder of the land.

Service roads to each of the pad foundations are necessary for both the construction and operational phases. These roads are typically graded, graveled and about 15 feet wide.[2] The tower erection cranes and equipment delivery tractor-trailers will use these roads during the construction phase. As many as 500, 30 ton truckloads may be required during construction to deliver specialized wind equipment, concrete and other site preparation materials. These uses will require turnaround areas and will restrict the steepness of grades and sharpness of turns.

Construction Requirements and Costs

The materials and labor requirements for this prototype facility were developed using site-specific information and interviews with a number of wind farm operations and development experts. It was assumed that the prototype wind farm would be developed at the Mesa Redonda site where the NMEMNRD has installed wind-monitoring devices.[3] Several unique Mesa Redonda site features must be considered when estimating construction materials and costs. These include the existence of a jeep trail to the site, predominately rocky soil, lack of an electric substation at the site and an estimated distance of five miles to the nearest distribution lines.

The construction of a wind farm may be divided into five phases: project development, site infrastructure, wind turbine installation, energization/commissioning and optimization.[4] This provides a plan that starts with facility sizing and site selection and ends with transferring a working wind farm to the operations team.

Project Development. This phase is neither labor nor materials intensive, but sets the groundwork for a successful project. The project development phase includes site and capacity determination, securing a purchase power agreement and the engineering and design of the facility. This phase also includes establishing an interconnect agreement and a power wheeling agreement if the power is not sold to the system to which the facility is directly interconnected.

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[1] Interview with Leif Andersen, NEG Micon Sales Director, January 28, 2000.

[2] Interview with Joe Marchese, Cerro Gordo Project Manager with FPL Energy, February 24, 2000.

[3] Site-specific information was obtained from the report "Potential Wind Energy Monitoring Sites in New Mexico: Results of a Field Trip to Inspect Prospective Sites," by Richard Simon and site visits by BBC personnel. Labor and materials requirements specific to this site were estimated from interviews with Joe Marchese, Project Manager of FPL Energy, Leif Andersen, Sales Director of NEG Micon, a leading wind turbine manufacturing company, and Walter Hornaday of Texas Wind Power. Additionally, construction and operation costs at both the 42 MW Cerro Gordo wind farm in Iowa and a wind farm in Minnesota at Lakota were extensively analyzed.

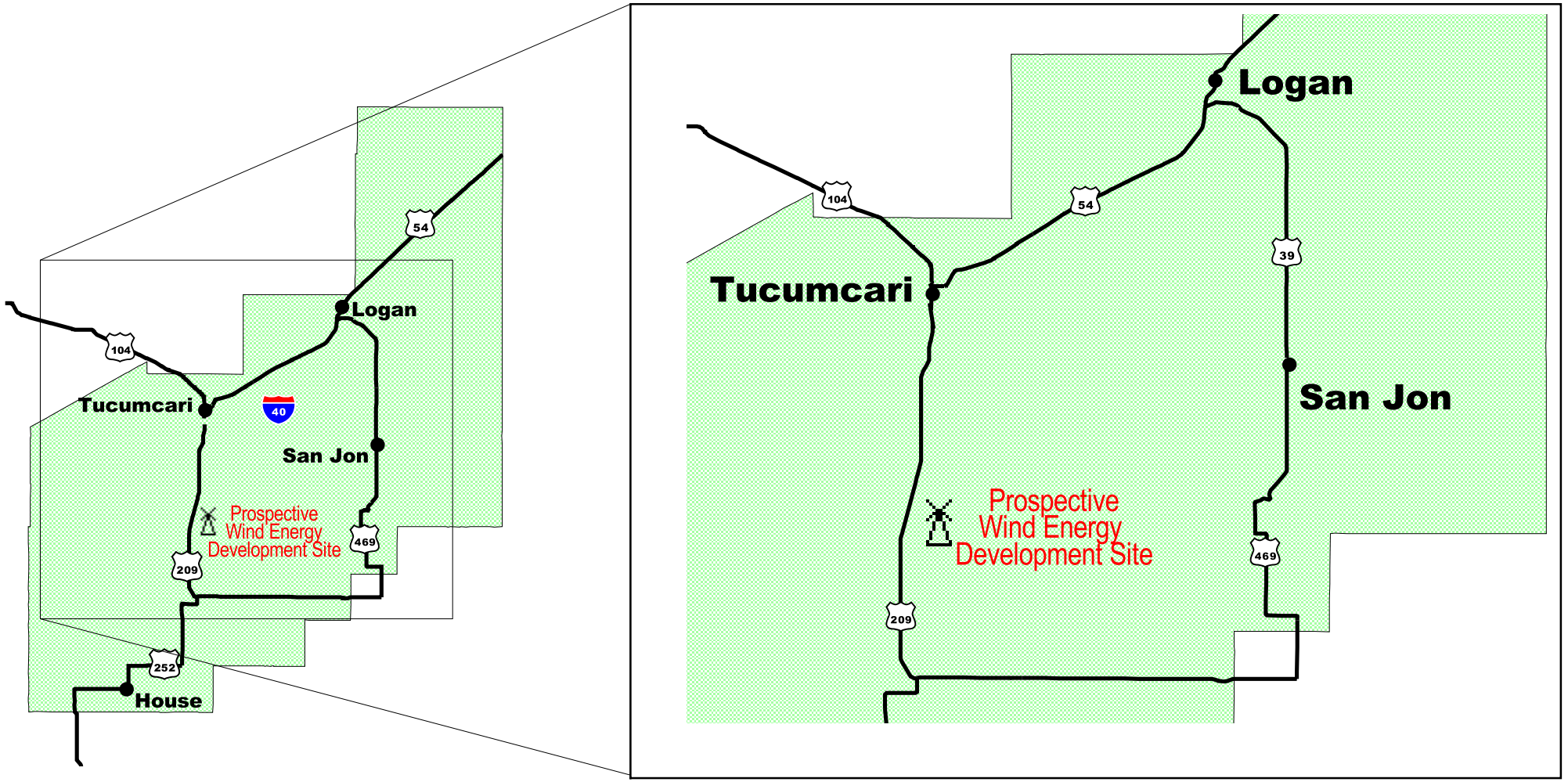
[4] This phase breakdown came from the "Southwest Mesa Wind Energy Project: Development, Construction and Installation of a 75 MW Windfarm" promotion video, produced by NEG Micon.

These agreements can be difficult to obtain and transmission access for wind facilities is a hotly debated subject throughout the U.S. at this time. Initially, potential sites are located using regional wind flow patterns and a review of the local terrain. Next, visits to potential sites are conducted to determine their size, proximity to the electricity grid and accessibility. Wind speed measuring equipment is then located on promising sites. Generally, wind speed will be monitored for at least one year before a site is finally chosen for the wind farm. Site wind speed is obviously very important, for example, 15 mile per hour wind speeds generate twice the electricity of 12 mile per hour wind speeds. The initial development steps have been completed for the Mesa Redonda site and wind speed monitoring is ongoing. A detailed map of the area local to the Mesa Redonda site, including nearby cities and roads, is provided in Exhibit III-2 on the following page.

Next, a power purchase agreement is typically negotiated with a utility company that commits the utility to purchasing all of the generated electricity at a given price over a long period of time. A power purchase agreement is essential because the bulk of the wind farm costs occur as initial capital requirements. If the power is not sold to the local utility in whose service are the wind facility is located, a power wheeling agreement will also be required. Once a site is chosen and agreements are in place, the necessary permits are obtained. The permitting process allows local community involvement and ensures that the wind farm will meet all local, state and federal regulations. Finally, infrastructure design proceeds and the number, type and size of wind turbines is determined. After this phase is complete, and turbines, blades, substation components and other equipment are delivered, three to six months remain until construction is complete. Given current demands for specialized wind farm equipment from the manufacturers, and challenges that may arise in negotiating interconnect and power wheeling agreements, up to a year might be required from the end of detailed design work to the beginning of actual operations.[5]

[5] Interview with Joe Peters, Texas Wind Corporation, May 16, 2000.

Exhibit III-2. Location of Prospective Wind Energy Facility in Quay County



Site Infrastructure. This phase involves building the service roads, power cable and communications trenches, tower foundations and transformer pads. Both the power cable and communications cables are installed at this point. The Mesa Redonda site will also require overhead power lines and a substation to be installed during this phase. An operations and maintenance facility will be built for subsequent use including turbine monitoring, maintenance equipment storage and as an office space for the maintenance crew.

Required construction materials include sand, gravel, cement, rebar and lumber for the transformer housing and buildings, all of which can usually be locally procured. Extensive grading, trenching and excavation are involved to lay five to ten miles of road and cable. An average of 30 to 50 workers are on site during the construction of the site infrastructure, with a peak work force of about 75. The bulk of these workers are commonly drawn from the local labor force, with site management typically provided by the project development firm.

Wind Turbine Installation. The support towers, turbines and blades are now separately transported to the site and assembled. While the turbines may be manufactured overseas and shipped to the U.S., depending upon the manufacturer, the towers and blades are usually manufactured in the U.S. Heavy equipment cranes are used to place the components in their operating configuration. Construction and installation workers still average about 30 people during this phase, though the work is more specialized and will likely involve fewer local residents. The computer control and communications equipment may now be installed.

Energization. After the wind turbine generators are assembled, the power cable connections are made to the electricity distribution grid through the foundation pad transformers and the substation. This work is often contracted to the local utility. The wind turbine generators are now ready to produce power.

Commissioning and optimization. In the final phase, adjustments are made to the control equipment to minimize acoustic vibrations and to maximize power output. At the completion of this phase, the wind farm is ready for operations and is turned over to the team or company that will run the facility.

Costs and materials. The materials and labor costs for construction of the prototype wind farm in Quay County have been broken down into easily identifiable components. Construction of the prototype facility to "turn-key" readiness is estimated to cost about $44 million. Exhibit III-3 shows these costs by major construction component. For purposes of assessing the economic impacts of construction on Quay County, these costs are further broken down in Section VI of this report into expenditures likely to occur inside Quay County and those likely to be spent outside the county.

Exhibit III-3.
Construction Costs by Item for a 40 MW Prototype Facility

Element	Cost	Notes
Turbine Related Equipment	$32,500,000	Includes turbines, towers, rotors, SCADA and all erection, commissioning and startup labor
Structural Construction	$5,200,000	Foundations, pads and roads
Engineering	$525,000	Construction and electrical
Electrical		
Substation	$700,000	
Transformers	$850,000	
Other Equipment and Cable	$1,500,000	Includes power and fiber optic plus installation
Meteoroligical Towers and Equipment	$110,000	Labor and materials
Project/Contractor Management		
Wages	$650,000	
Supervisory	$350,000	
Vehicles	$35,000	
Room and board	$100,000	
Field office	$90,000	
Legal services	$40,000	
Travel	$70,000	
Miscellaneous local	$70,000	
Operating and Maintenance Facility	$180,000	
Final Design and Testing	$200,000	
Utility Interconnect	$225,000	
Contingency	$375,000	
Total	**$43,770,000**	

Source: BBC estimates based on data from previous wind farm construction costs.

Operating Characteristics

A wind farm will generate less electricity than its total nameplate capacity because of varying wind speeds that are above or below the optimal speed for the turbines. Typically, wind farms located in areas with a good wind resource, such as Mesa Redonda, operate at 30 to 40 percent of nameplate capacity. The study team estimates that a Quay County wind farm at

this site could generate between 107,000-megawatt hours (MWh) and 142,000 MWh of electricity per year operating at capacity factors of 30 to 40 percent. For purposes of this analysis, we have assumed that this facility will operate at an average annual capacity of 35 percent, generating 124,000 MWh of electricity.

As discussed in the site development phase of construction, the developer or operator will have arranged a power purchase agreement with an electric utility. This power purchase agreement will commit the utility to purchase all of the generated electricity, regardless of the time or amount produced, at a given price. These agreements typically range between three cents and 4.5 cents per kilowatt-hour. Assuming the Mesa Redonda wind farm generates 124,000 MWh of electricity, annual gross revenues might range from $3.7 to $5.6 million. We will assume that this facility generates $4.5 million in annual gross revenues for the purposes of evaluating fiscal impacts, later in this report.

Land royalties for wind farms on private lands generally range between two and five percent of gross revenues, depending partly upon the alternative uses of the land. Higher value alternative uses, such as potential for future housing development or high intensity agricultural use, often drive the royalties towards the upper end of this range. The middle of this range appears to be a reasonable royalty estimate based on the experience of nearby facilities in Texas.[6] Mesa Redonda is both private and state owned. Based on the size and probable layout of the wind facility, a reasonable estimate is an even division of the site between the private and state owned land. Therefore lease revenues would accrue both to the State of New Mexico and private landowner(s). Given the estimate of gross revenues above, approximately $75,000 would be paid annually to the State and $75,000 annually to the private landowner(s). It should be noted that state land royalty rates are negotiated and a lower level could be chosen to promote the development of wind energy, or a higher level might be bargained for if the site is deemed especially attractive by wind developers.

A 40 MW wind farm will require an operations and maintenance crew of three to five full-time individuals. Operators often choose one to three of the best local construction workers and train him or her to fill one of the maintenance slots. The remaining positions are typically filled with specialized, non-local personnel.[7]

Routine operations and maintenance activities consist of performance monitoring, blade washing, oil changes, substation maintenance, and infrastructure upkeep. Three months after the initial turbine energization, workers will perform a shakedown maintenance that requires about 15 hours per turbine. Unscheduled maintenance may be performed by the turbine manufacturer and is initially covered under warranty.

Many of the services and materials required to maintain a wind farm are locally procured. A good local machine shop is essential to manufacturing replacement parts and keeping the turbines operational.

[6] Interview with Joe Peters, Texas Wind Corporation, May 16, 2000.

[7] Interview with Joe Marchese, Cerro Gordo Project Manager with FPL Energy, February 24, 2000 and confirmed in an interview with Walter Hornaday at Texas Wind Power on April 5, 2000.

Annual land royalty and lease payments are combined with other operations and maintenance expenses and presented in Exhibit III-4.[8] This prototype facility would have an estimated $650,000 in annual expenses, excluding property taxes and debt service on financing for the construction costs. Labor and management are the largest expenses, at nearly $400,000 annually. Using the assumption that the two non-local operations and maintenance workers move to Quay County, more than one-half of the labor and fees will be earned by local residents. Material and services, including insurance and utilities, are estimated at $110,000 annually, with about 60 percent spent locally. The remaining $150,000 is land leases and royalties, accruing to private landowners and the State of New Mexico.

Construction and operation of a wind farm like this prototype facility could be expected to affect the economic and fiscal conditions of Quay County in a variety of ways. Approximately $44 million would be spent on construction, though a substantial portion of this total would be for specialized equipment manufactured elsewhere. About $0.65 million would be spent annually for operations and maintenance, with the bulk of these expenditures occurring within the county. Direct and indirect economic and fiscal effects of these activities are described in the final section of this report.

Exhibit III-4.
Yearly Operations and Maintenance Costs by Item
for a 40 MW Prototype Facility

Element	Cost
Personnel	
Field Salaries	$190,000
Administrative	$50,000
Management	$150,000
Subtotal	$390,000
Materials and Services	
Vehicle, Building and Grounds Maintenance	$7,000
Rentals and Security	$3,000
Turbine Parts	$3,000
Community Activities	$5,000
Environmental	$5,000
Freight and Travel	$5,000
Project Insurance	$30,000
Utilities	$20,000
Miscellaneous Services	$17,000
Miscellaneous Fees, Permits and Licenses	$7,000
Miscellaneous Materials	$8,000
Subtotal	$110,000
Land Lease/Royalty Payment	$150,000
Total Annual Cost excluding debt payment.	$650,000

[8] This information was developed using budgeted and actual expense data from a 42 MW wind farm and several interviews with wind farm project managers.

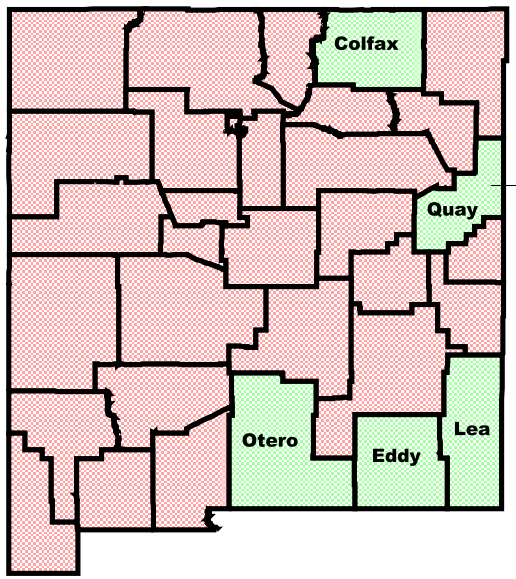
SECTION IV.
Quay County Socioeconomic and Fiscal Conditions

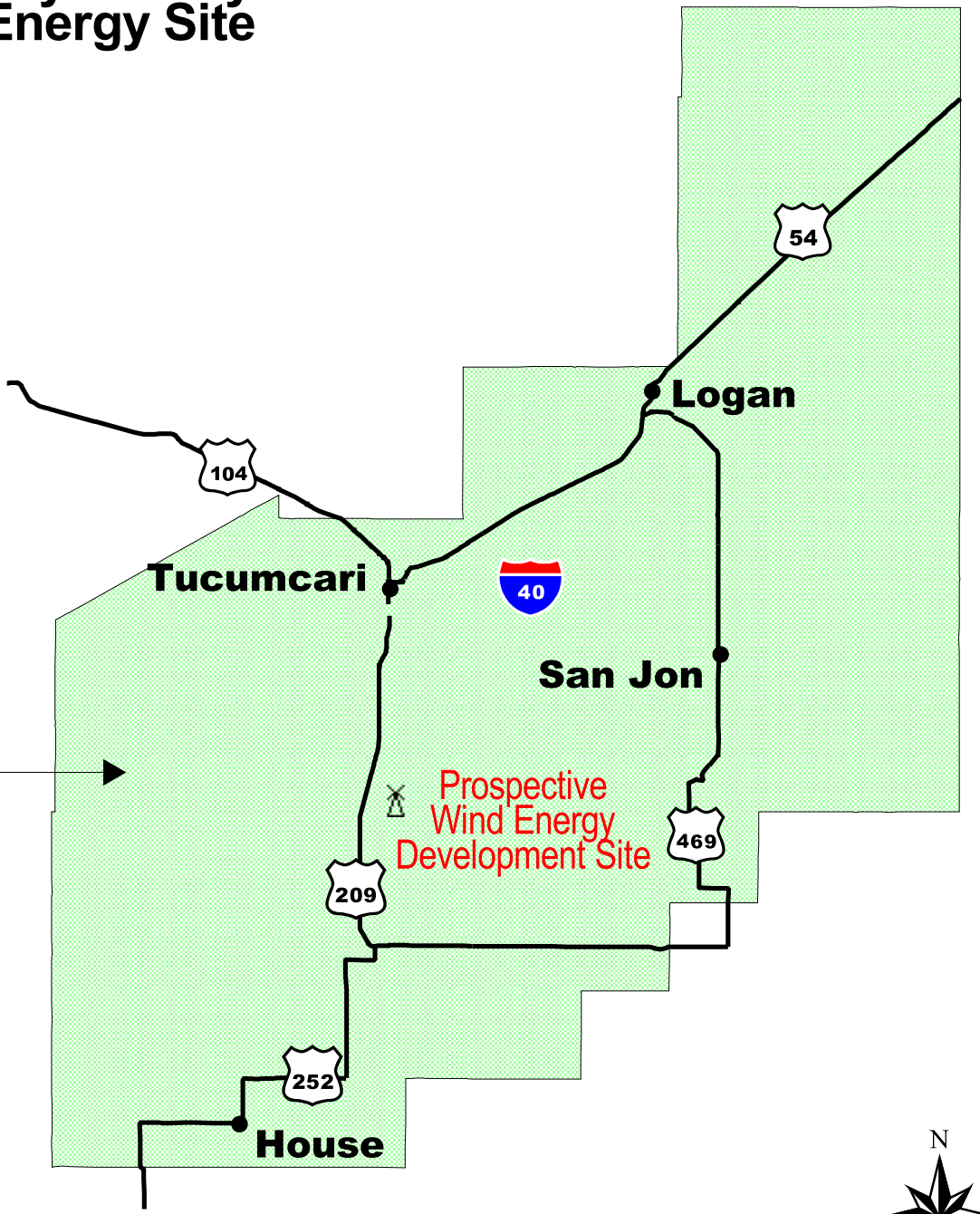
This section describes current demographic, economic and fiscal conditions in Quay County, as well as historic trends in these characteristics. This information serves two purposes for this study. First, the economic benefits and impacts of commercial wind power development on Quay County are determined, in part, by the existing socioeconomic environment of the county and the extent to which wind power activities complement or conflict with that environment. Second, the existing socioeconomic characteristics of the county provide a baseline against which to measure the effects of wind power development.

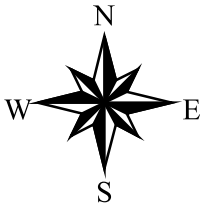
Quay County is located in the northeastern quadrant of New Mexico and the eastern border of the county is the state border with Texas. Exhibit IV-1 depicts the county's location, the location of major towns and highways and the prospective site for commercial wind power development.

The following text describes Quay County population growth, followed by the demographic characteristics of that population. Income and employment are described next. The section concludes with a description of County fiscal conditions and a set of baseline economic and demographic projections for the next ten years.

Exhibit IV-1. Overview of Key Quay County Features and Prospective Wind Energy Site







Population

More than 10,000 people lived in Quay County in 1998. Well over one-half of the County's population were residents of the City of Tucumcari. Three other incorporated cities; House, Logan and San Jon, accounted for about one-eighth of the County's population, with the remainder living in unincorporated areas. Exhibit IV-2 depicts the 1998 population distribution of Quay County.

Exhibit IV-2.
Quay County Current Population, 1998

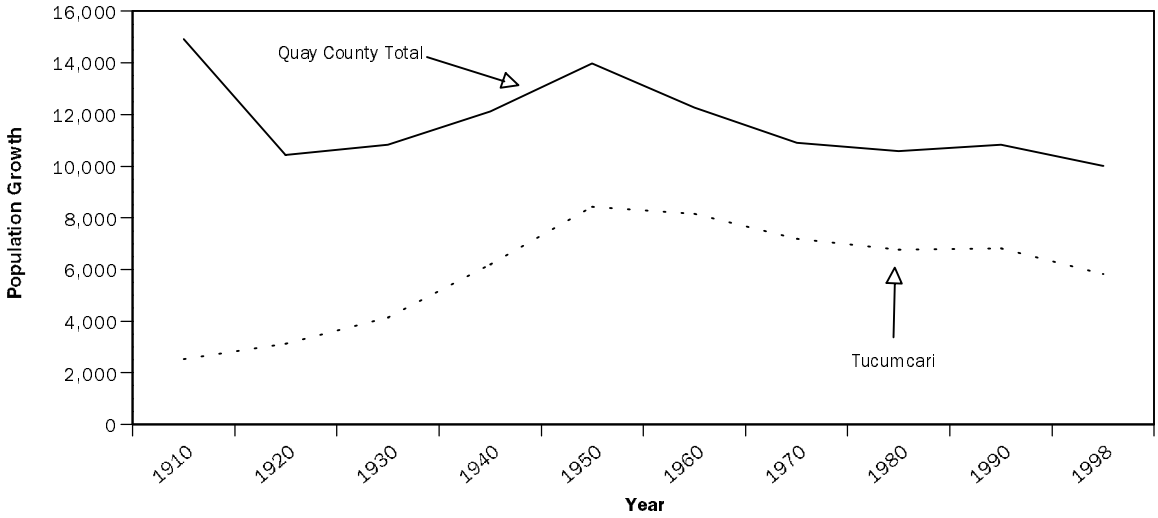
Location	Population	Percentage
Tucumcari	5,825	58.1%
Logan	985	9.8%
San Jon	285	2.8%
House	95	0.9%
Unincorporated County	2,834	28.3%
Quay County Total	10,024	100.0%

Source: U.S. Census Bureau.

Historical trends. Both the City of Tucumcari and Quay County as a whole grew rapidly during the 30-year period from 1920 to 1950. For most years since the 1950s, Quay County population has steadily declined, with nearly 4,000 residents leaving by 1998. However, the County did have four years of good growth in the early 1980s. The population decline occurred as the County's economic growth lagged that of other states and bigger cities, drawing residents to better opportunities elsewhere. The replacement of SR 66 with Interstate 40 also took traffic away from downtown Tucumcari and further contributed to its economic decline.

The population of both the County and its largest city remained fairly stable during the late 1970s and 1980s. However, the out-migration of Quay County and Tucumcari residents resumed during the 1990s. In recent years, reduced over-night stops and servicing of long-haul trucks and railroad traffic have taken a toll on local businesses and population. During the 1990s, average annual population decline in Quay County has been about 0.6 percent, while the statewide average is a growth rate of about 1.6 percent. Exhibit IV-3 depicts historical population growth and decline in Quay County and the City of Tucumcari.

Exhibit IV-3.
Comparison of Historical Population Growth



Source: U.S. Census Bureau.

Demographic Characteristics

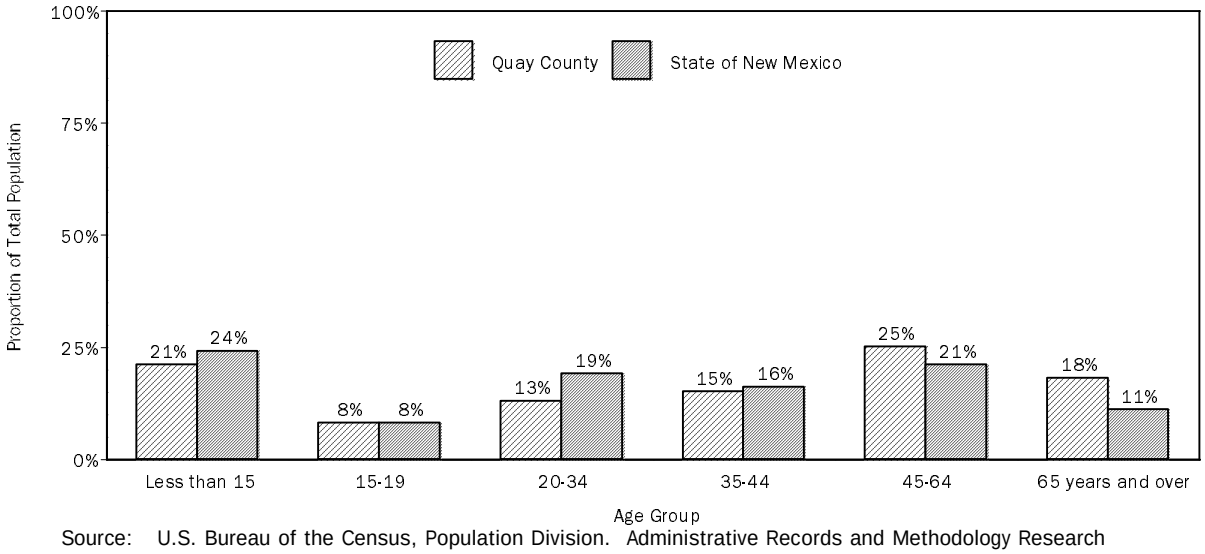
While the characteristics of the Quay County population mirror New Mexico as a whole in a number of aspects, the county population is distinctive in several ways.

Household formation. Quay County residents lived in approximately 4,000 households in 1998. The average household size in the county, 2.53 residents, is smaller than the average household size throughout New Mexico, which is 2.74 residents per occupied unit.[1]

Age profile. By comparison to the state as a whole, a larger proportion of Quay County residents are over the age of 65. The county also has a larger share of working adults in the latter stages of their careers (ages 45 to 65) and a somewhat smaller share in the younger working years (e.g., ages 34 and below). Exhibit IV-4 depicts the age profile of Quay County residents compared to the State of New Mexico as a whole.

[1] 18,527 estimated 1998 households based on 1998 population estimate and 1990 average household size and group quarters population from Census STF1A (1990).

Exhibit IV-4.
Comparison of Quay County with the State of New Mexico
Proportion of Total Population by Age Group, 1998



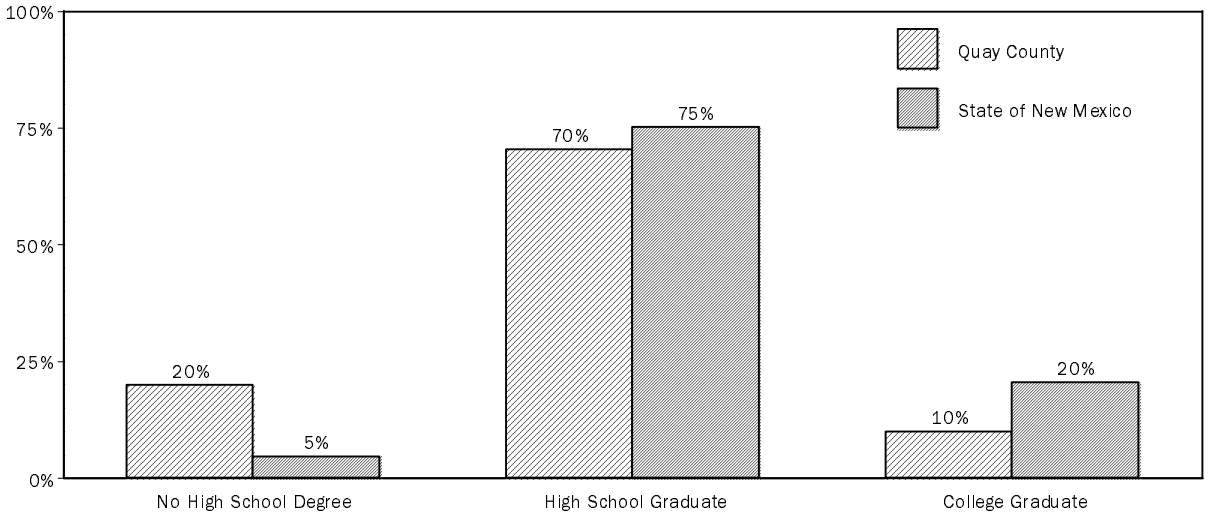
Source: U.S. Bureau of the Census, Population Division. Administrative Records and Methodology Research Branch, September 1999 release.

Ethnic and racial composition. The ethnic and racial composition of Quay County population differs in some respects from the state as a whole. About 40 percent of Quay County residents are of Hispanic origin, according to the most recent Census estimates for 1998. This proportion matches the statewide average. However, racial minorities comprised only two percent of Quay County residents in 1998, compared to about 12 percent for the state as a whole.

Mobility. Historically, the population in Quay County has been relatively stable. As of the 1990 Census, 82 percent of Quay County residents had lived in the county for five years or more. Seven percent of 1990 county residents had moved from another county in New Mexico during the preceding five years, while 11 percent had moved into the county from outside the state during that period.

Educational attainment. On average, the educational attainment of Quay County residents has historically been less than that of the population of the state as a whole. Based upon 1990 Census data, now nearly ten years old, about one-fifth of the county's residents age 25 and older did not have a high school degree — compared to only five percent of the overall state population of similar age. Only ten percent of county residents had a college degree in 1990, compared with about 20 percent of the statewide population. Exhibit IV-5 depicts comparative educational attainment levels for the county and the state.

Exhibit IV-5.
Educational Attainment
New Mexico versus Quay County, 1990



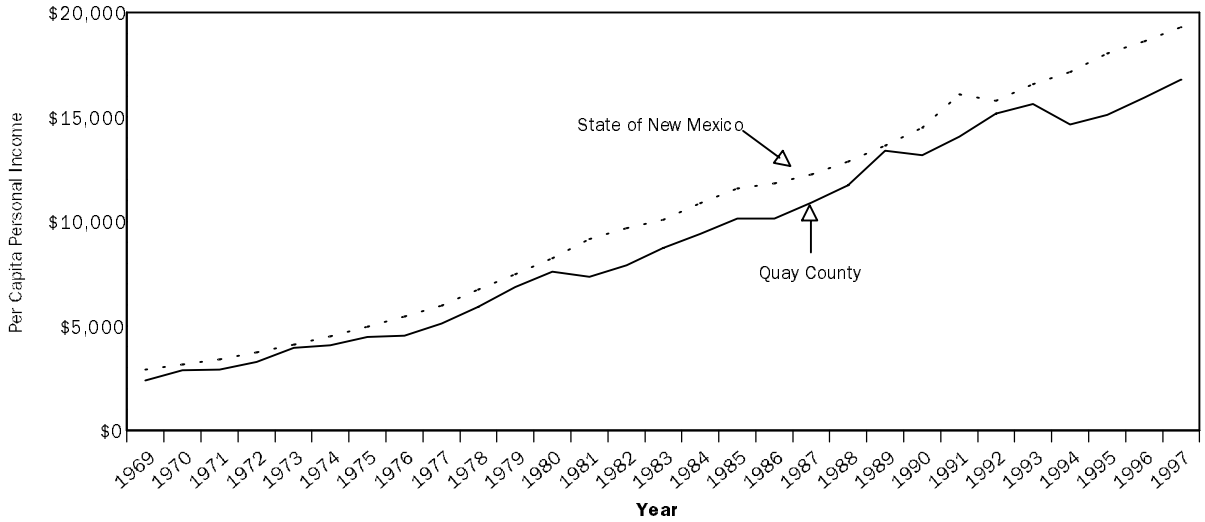
Note: Percentages based upon population age 25 or older.
Source: U.S. Bureau of the Census.

Income and Employment

The median household income in Quay County in 1995 (the most recent available data) was over $21,000. This figure is about $6,900 per household lower than the median household income throughout the State of New Mexico. In comparison to 1989 household income levels, Quay County median income increased by only 12 percent by 1995 compared, with an average increase statewide of 16 percent.

Resident income levels. In 1997, the estimated average income per resident in Quay County from all sources was $16,800. This average is about $2,500 lower than the statewide average. A longer term look at average income per resident suggests that Quay County incomes have not grown as rapidly as the statewide average since the early 1980s and fell significantly behind in the early 1990s. Exhibit IV-6 depicts the growth in personal income per resident in Quay County from 1969 through 1997 and corresponding figures for the state as a whole.

Exhibit IV-6.
Comparison of Per Capita Personal Income, 1969-1997



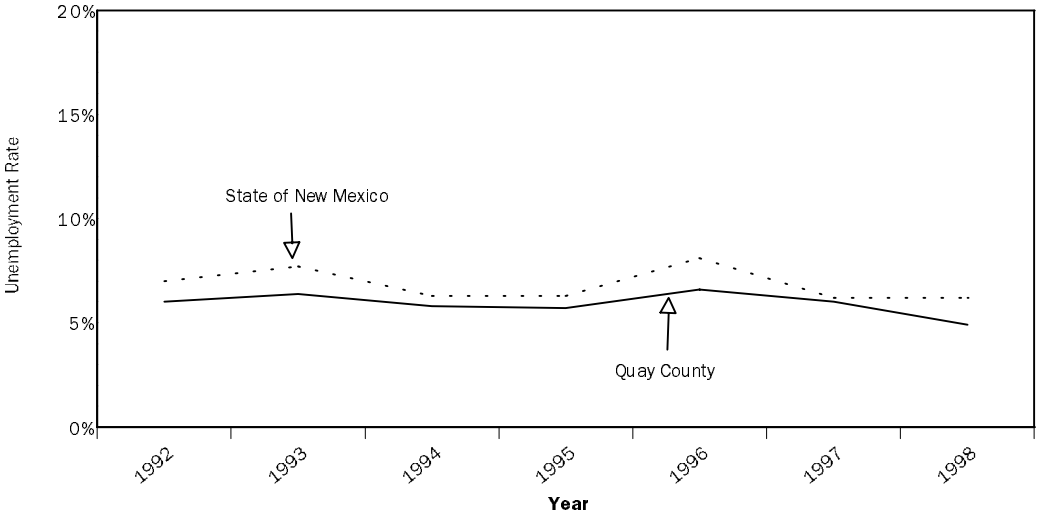
Source: U.S. Bureau of Economic Analysis, Regional Economic Information System.

In addition to average incomes that are much lower than the state average, a much larger proportion of Quay County residents live below the poverty line. Census estimates for 1995 indicate that 27.0 percent of Quay County residents lived in poverty compared with 20.2 percent of all New Mexico residents.

Labor force and unemployment. In 1998, about 4,500 Quay County residents were in the labor force — either as employed workers or individuals actively looking for employment. Based upon the number of Quay County residents age 16 and older, the labor force participation rate was approximately 58 percent. This participation rate is about five percent lower than the state of New Mexico average participation rate of 63 percent.

During the 1990s, the unemployment rate in Quay County remained lower than the state average. However, given the low labor force participation rate, this may not be a good indicator of a person's employment or wage prospects. After peaking at 6.4 percent unemployment in 1996, the county's unemployment rate had decreased to about 4.9 percent by 1998, approximately 1.3 percent lower than the state average. Exhibit IV-7 depicts Quay County and State of New Mexico unemployment rates from 1992 through 1998.

Exhibit IV-7.
Comparison of Unemployment Rates, 1992-1998



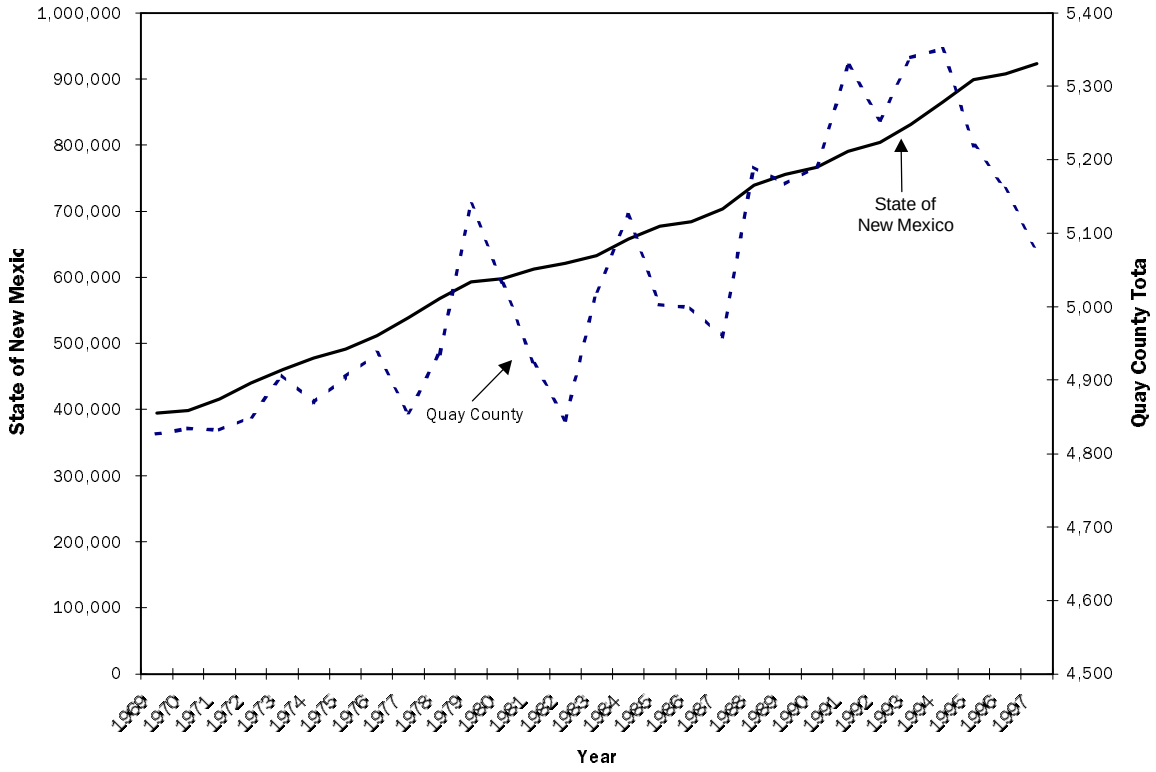
Source: New Mexico Department of Labor, Economic Research and Analysis Bureau.

About 200 Quay County residents, representing approximately five percent of the employed workforce, commute to jobs outside the county. This out-commuting is more than offset by the more than 250 residents of neighboring counties commuting to work at jobs located in Quay County.[2]

Job growth and employment mix. Job growth in Quay County has been very erratic since 1970. The low number of business establishments and limited number of jobs makes total employment sensitive to the success of each firm. As shown in Exhibit IV-8, Quay County employment has decreased by about 275 jobs between 1994 and 1997. This mirrors a similar employment decline within Quay County in the early 1980s. Taking a longer-term perspective, Quay County average annual job growth has been only 0.2 percent since 1969, while the State of New Mexico has an average annual job growth of 3.1 percent during this same period.

[2] U.S. Bureau of Census, 1990 Commuting Files.

Exhibit IV-8.
Comparison of Total Employment, 1969-1997

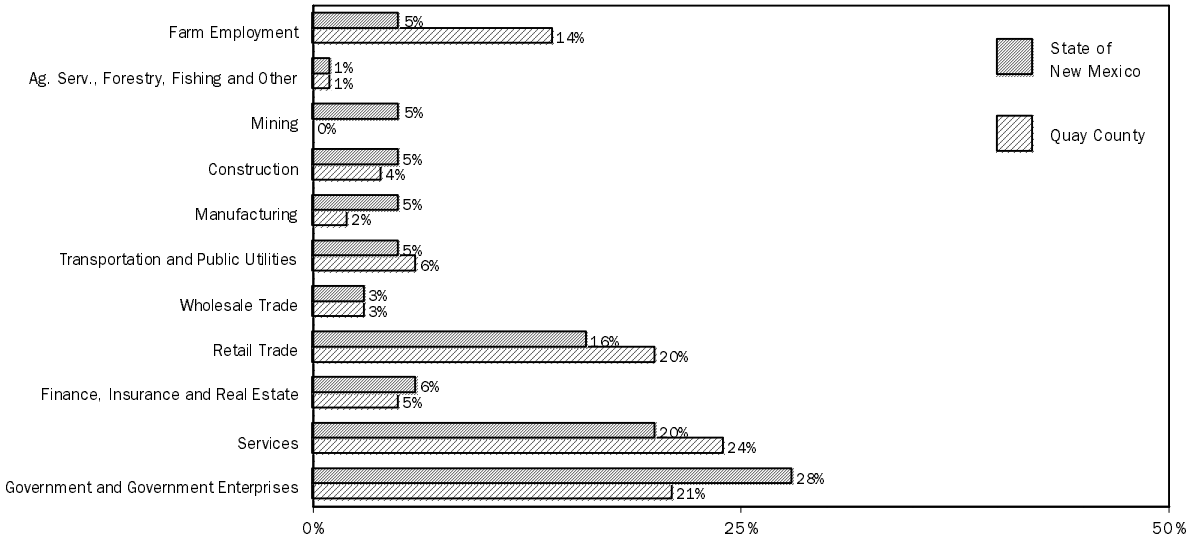


Source: U.S. Bureau of Economic Analysis, Regional Economic Information System.

As in most counties, the service, government and retail trade sectors account for the largest number of Quay County jobs. However, the Quay County employment mix is distinguished from the state as a whole by the large number of jobs in farming and the lack of jobs in the mining and manufacturing sectors. Agriculture brought in over $50 million in receipts to the County in 1999. Quay County supports over 63,000 head of cattle and irrigates 55,000 acres of farmland.[3] Exhibit IV-9, which compares the share of total 1997 employment in each sector between Quay County and the state as a whole, indicates the relative lack of mining, construction and manufacturing sectors within the Quay County economic base.

[3] Tucumcari Economic Development Department, 2000.

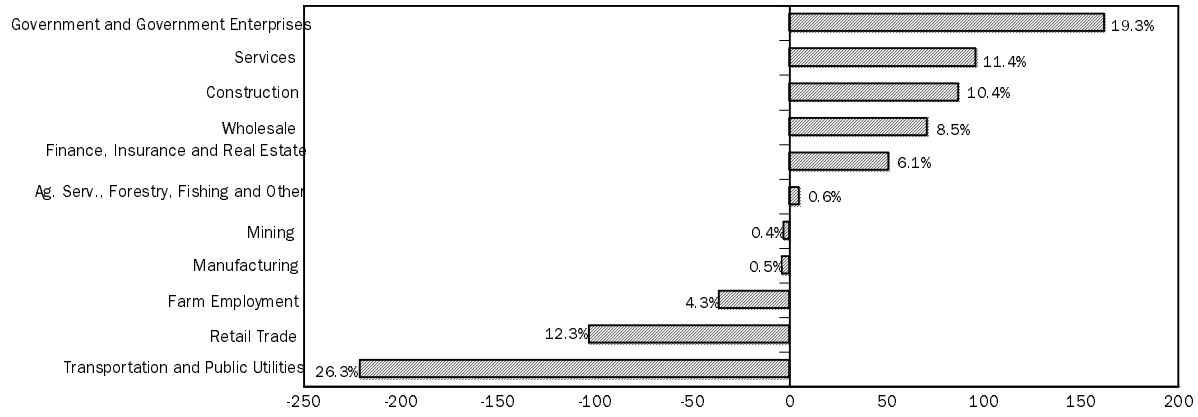
Exhibit IV-9.
Comparison of Employment by Sector, 1997



Source: U.S. Bureau of Economic Analysis, Regional Economic Information System.

Between 1987 and 1997, just over 100 net new jobs were created in Quay County. Job growth occurred in only six sectors and was largely offset by job losses in the remaining four sectors. Tellingly, the majority of new jobs were in the Government and Government Enterprises sector, which has very limited future growth opportunities. On the other hand, the retail trade and transportation, communication and public utilities (TCPU) sectors has a combined net job loss of over 300 jobs. The loss of trucking and railroad jobs, evident in the over 200 jobs lost in the TCPU sector, has been particularly devastating to the county. Exhibit IV-10 depicts net job growth and decline by sector from 1987 to 1997.

Exhibit IV-10.
Net New Jobs by Sector, 1987-1997



Source: U.S. Bureau of Economic Analysis, Regional Economic Information System.

As of 1997, Quay County had about 30 employers with 20 or more employees and about 280 small businesses with fewer than 20 employees. The largest employers in the County are shown in Exhibit IV-11.

Exhibit IV-11.
Twenty Largest Employers

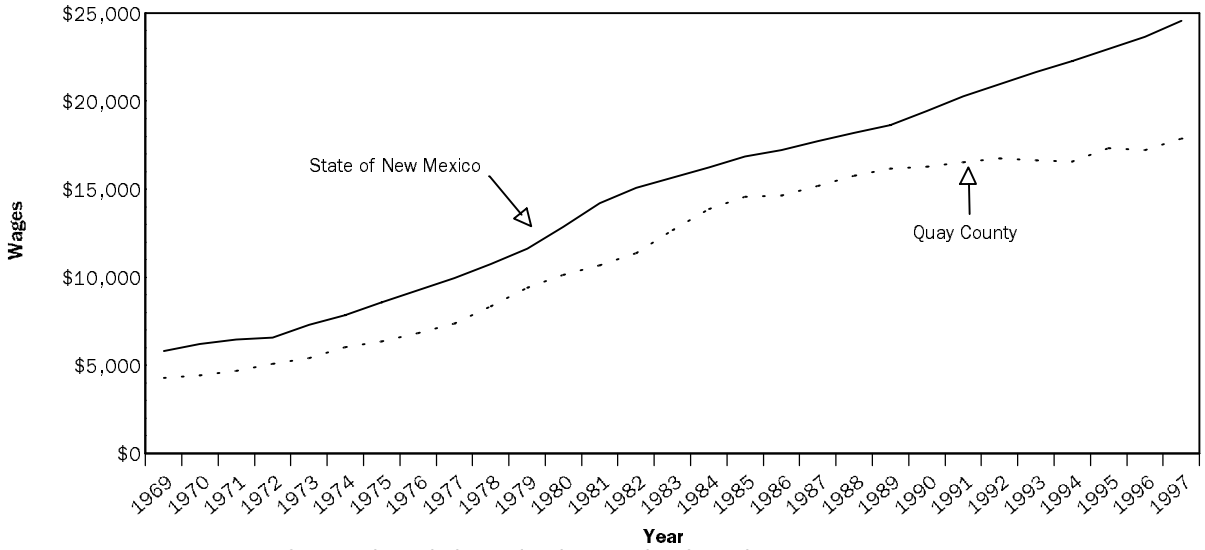
Employer	City	Industry	# of Employees
Union Pacific Railroad	Tucumcari	Motor vehicle parts and accessories	120
City of Tucumcari	Tucumcari	City council	108
Dr Dan C Trigg Memorial Hosp	Tucumcari	General medical and surgical hospitals	96
Kmart 9264	Tucumcari	Department stores, discount	75
Quay County	Tucumcari	Executive offices	74
Team Builders Counseling Svcs	Tucumcari	General counseling services	73
Tucumcari Truck Terminal	Tucumcari	Filling stations, gasoline	68
Furrs Supermarkets Inc	Tucumcari	Retail bakeries	55
Furrs Supermarkets Inc	Tucumcari	Supermarkets, chain	54
Alco Store 195	Tucumcari	Department stores	50
Best Western Discovery Inn	Tucumcari	Hotels and motels	50
Mesa Technical College	Tucumcari	Vocational schools, nec	48
Van Ark Care Center	Tucumcari	Skilled nursing care facilities	48
Holiday Inn Inc	Tucumcari	Hotels	45
Pow Wow Inn	Tucumcari	Motels	43
Pachecos Trucking	Tucumcari	Dump truck haulage	40
Tucumcari High School	Tucumcari	Elementary and secondary schools	40
Lowes Marketplace 94	Tucumcari	Grocery stores, chain	38
New Mexico State Police Sub	Tucumcari	State police	35
Tucumcari Middle School	Tucumcari	Public junior high school	34

Source: Dunn and Bradstreet Marketplace Data, January-March 2000.

Wage and salary earnings. The average wage per job in Quay County in 1997 was about $17,880 — well below the state average of $24,580. The average wage per job in Quay County has been consistently below the state levels during the past 30 years. Until the early 1990s, the County's average wage rate increased proportionate to the States'. Since 1990, however, Quay County has fallen further behind the state level. According to Robert Lamb, the Quay County Manager, most jobs in the County pay only the minimum wage.[4] Exhibit IV-12 compares the average wage per job in Quay County and New Mexico from 1969 to 1997.

[4] Interview with Robert Lamm, Quay County Manager, May 9, 2000.

Exhibit IV-12.
Comparison of Average Wages per Job, 1969-1997



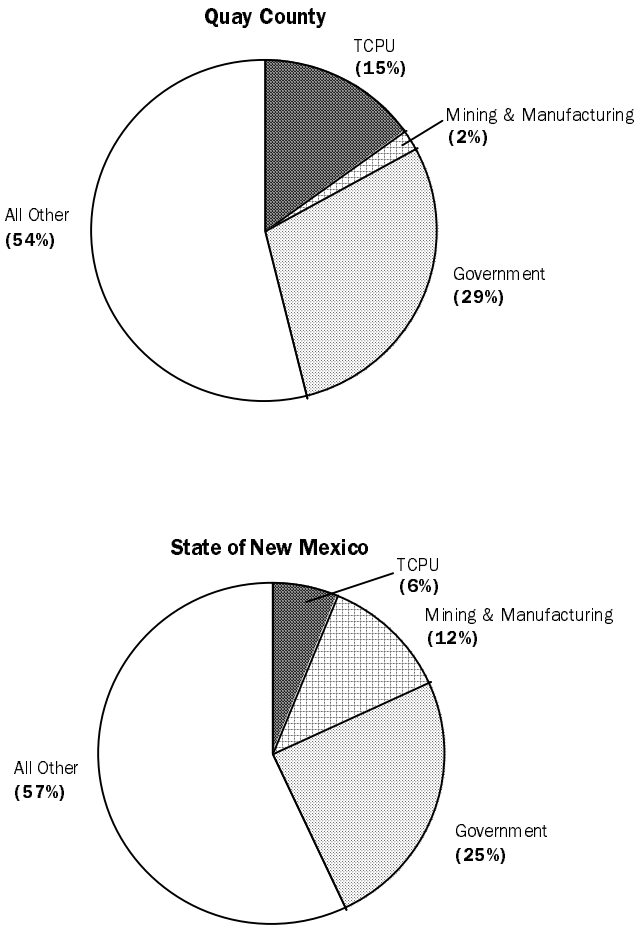
Source: U.S. Bureau of Economic Analysis, Regional Economic Information System.

Closer examination of wage levels and total employee earnings by sector reinforce the impact of losing jobs in the TCPU sectors. Jobs in the manufacturing, mining and TCPU sectors were the highest paying in the County in 1997, with average earnings of more than $43,000 per worker. The three largest county employment sectors, government, services and retail trade, paid employees less than $24,000, $17,000 and $13,000 per worker, respectively. Note that the government and services sectors had the largest job growth between 1987 and 1997. Quay County average wages in tourism and retail trade were lower than the state average.[5]

Wage and salary earnings of employees in the TCPU and government sectors comprised a much larger share of Quay County earnings in 1997 than state earnings. While the County's share of employment in the TCPU sector is only slightly above the state's share, this sector pays a much higher wage in Quay County. In fact, it is the only sector that has a higher average wage at the county level than at the state level. However, mining and manufacturing combined, two typically well paying sectors, comprise only two percent of Quay County earnings. This compares to the state's 12 percent of earnings gained from these two sectors. Exhibit IV-13 illustrates these comparisons.

[5] U.S. Bureau of Economic Analysis, Regional Economic Information System, 1999.

Exhibit IV-13.
Percent of County Wage Income by Sector



Source: U.S. Bureau of Economic Analysis, Regional Economic Infrastruction System.

Tourism. While high paying jobs in the energy related sectors are one component of the Quay County economic base, tourism also brings a substantial amount of money into the County. Interstate 40 runs east and west through the center of Quay County and through the south end of Tucumcari. Traffic through Tucumcari brings approximately 4,000 travelers into the city every day.[6] The city has 30 motels/hotels with over 1,200 rooms to support overnight stops. Ute Reservoir, in the northern portion of the county, serves as a tourist destination and offers boating, fishing and camping.

Economic Development Opportunities and Constraints

In response to recent losses in the transportation industry and a tourism industry that generally offers only the minimum wage, Quay County leaders are actively seeking opportunities to diversify and expand the county's economic base.

[6] Ray Hohstadt, Tucumcari City Manager, Tucumcari Magazine, 2000.

Quay County has a number of strengths from an economic development standpoint. There is excellent Interstate road access to the east and west using I-40 and on U.S. Highway 54 south into Mexico. A major Union Pacific line runs through the county and Tucumcari. Development incentives are often offered to firms locating in the county, including low cost leases in Tucumcari in a 22-acre industrial park and two city-owned buildings. Quay County also has relatively low wages and offers customized workforce training to area employers at Mesa Technical College.

Current Quay County economic development efforts are focused on attracting call centers. Tucumcari sits on a high-speed fiber optic line and has workforce characteristics that should help the city attract call centers. Another economic development focus is on the transportation industry. Quay County has continued to lose jobs in rail service and trucking as regional transportation patterns have changed. However, Tucumcari has recently attracted a major long-haul truck operator and is working to attract additional trucking firms.[7]

Important constraints to economic development for Quay County include remote location and a relatively small population. The county's major population center, Tucumcari, is about three hours by road from the nearest large city, and major air service, in Albuquerque. The county's small population and low number of firms may also make it difficult to bring in industry that depended upon other firms for supply or a large and technically trained labor force.

Quay County Fiscal Conditions

Commercial wind energy development could potentially impact local government financial conditions in Quay County in several ways. While purchases of goods and services during wind development construction and operation would likely effect gross receipts tax revenues for many of the jurisdictions within the County, past wind project experience in other locales indicates that the largest fiscal effect would result from property taxes on wind energy development. Since the prospective wind energy site is located in an unincorporated portion of the county, the following description focuses on Quay County fiscal conditions, rather than fiscal conditions within Quay County municipalities or other jurisdictions.

County revenues and revenue sources. Revenues available to Quay County government totaled about $5 million in 1999. This figure represents about $499 per Quay County resident, about 44 percent more than the $347 per resident average among New Mexico counties in 1999.[8] However, a more relevant comparison may be the revenues available per resident living in unincorporated areas, since these individuals are typically the largest service recipients from county governments. Quay County's 1999 revenues represented about $1,764 per unincorporated resident. This average is about 15 percent more than the state average of $1,540 per unincorporated resident.[9]

[7] Interview with Robert Lamm, Quay County Manager, May 9, 2000.

[8] BBC estimate based on NM Department of Finance and Administration, *Financial and Property Tax Data Fiscal Year 1999* and U.S. Bureau of Census population estimates.

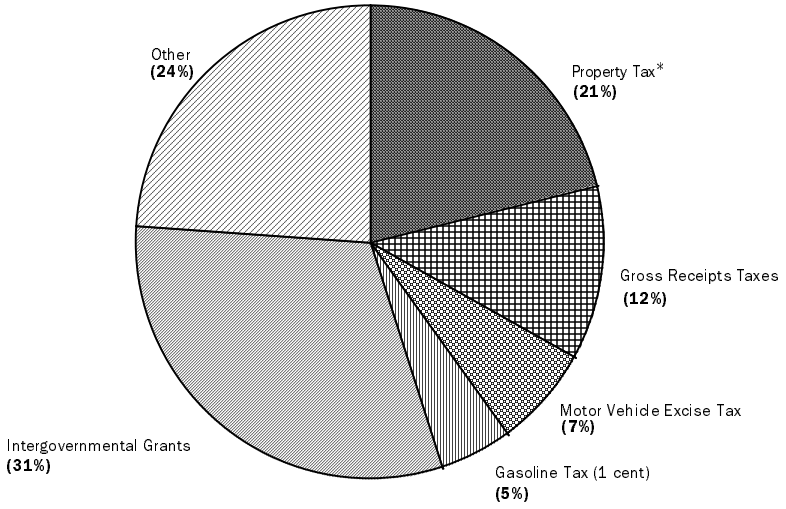
[9] Ibid. All county revenue figures exclude enterprise funds, trusts and agency funds for comparability purposes.

The largest sources of Quay County revenues in 1999 were property taxes (including oil and gas ad valorem taxes) and gross receipts taxes. 1999 property tax and oil and gas ad valorem tax revenues reflect the County's taxable value of about $97 million for the 1999 tax year and the county operational tax levy of 11.850 mills. Only about one percent of the county's taxable value consists of oil and gas production and taxable equipment, reflecting the lack of petroleum resources in the County. The lowest taxable value for the County, in 1996, was about $86 million, while the highest, in 1999, was nearly $97 million — reflecting about a 13 percent increase in four years.

Gross receipts taxes are the next largest source of revenue for Quay County government, representing about $597,000 in 1999. The effective gross receipts tax rate in unincorporated portions of Quay County is 5.625 percent, including the 5 percent state gross receipts tax. Of the County's 0.625 percent portion of the gross receipts tax, 0.125 percent is dedicated to hospitals and 0.125 percent is dedicated to County environmental expenditures.

Exhibit IV-14 provides a breakdown of 1999 Quay County revenues by source.

Exhibit IV-14.
1999 Quay County Revenues by Source

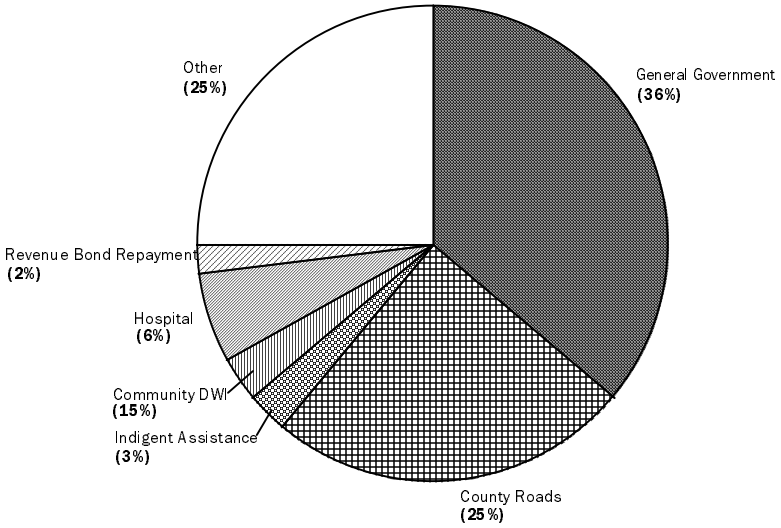


Total 1999 Revenues = $5.0 Million

* Includes Oil & Gas Ad Valorem.
Source: New Mexico Department of Finance and Administration, Financial and Property Tax Data, FY 1999.

County expenditures and fund balances. In 1999, Quay County government spent about $5 million to provide services to County residents. About 58 percent of these expenditures were in the areas of roads and general government — including the County Sheriff's Department, County Commission, County Clerk and Assessor and other activities. The County spent about $775,000 on intergovernmental grants and about $94,000 for revenue bond repayment. Exhibit IV-15 provides a breakdown of 1999 Quay County expenditures.

Exhibit IV-15.
1999 Quay County Expenditures by Category



Total 1999 Expenditures = $5.0 Million

Source: New Mexico Department of Finance and Administration, Financial and Property Tax Data, FY 1999.

Comparison of 1999 Quay County revenues and expenditures indicates the County expended about $9,000 less in 1999 than it received in revenues. This surplus was added to County reserves, which stood at $2.0 million as of June 30, 1999. The County continues to maintain a reserve of about $821,000 for general government purposes, and $763,000 for county roads and no reserve for capital projects.

Quay County's reserve balance is equivalent to about 40 percent of the County's annual revenues. By this measure, the county's reserve balance is relatively low — other counties with prospective wind development sites evaluated in this study have reserve to revenue ratios ranging from about 40 percent of their annual revenues to more than 100 percent. The statewide average among New Mexico counties is about a 70 percent reserve to revenue ratio.

Summary of Existing Conditions

As of 1998, Quay County had approximately 10,000 residents, almost three-fifths of whom lived within the city limits of Tucumcari. While Quay County population grew rapidly from about 1920 to 1950, a substantial economic downturn during the 1960s led to a decline in population and the county has only recently recovered to surpass the 1960 population level.

In some respects the demographic profile of Quay County residents is similar to the rest of New Mexico, though Quay County residents are more likely to be over the age of 45. Quay County residents, on average, have less formal education than typical in New Mexico.

Average incomes in Quay County are lower than the state average in New Mexico and a larger proportion of the county's residents live below the poverty line. The unemployment rate in Quay County has been lower than the state average throughout the 1990s, although the labor participation rate is also lower.

Compared to the state as a whole, a disproportionate share of Quay County jobs are in the low paying agriculture, service and retail trade sectors. While a large portion of the county's wage income is derived from transportation, this sector is rapidly losing jobs. There are many government workers in Quay County. In addition to agricultural activity, tourism is an important part of the Quay County economic base, primarily as a waypoint on I-40.

Current Quay County economic development efforts are focused on creating through call center, transportation service and truck operator firm attraction. However, any businesses that offer better opportunities for minimum wage workers in the service industry are welcomed. Land, buildings and other incentives are offered to firms expanding or locating with the county.

From a fiscal standpoint, Quay County revenues per county resident, and per resident living in unincorporated areas, are higher than average among New Mexico counties. The largest source of county revenues is property taxes. The county spent $9,000 or less in 1999 to provide services than it received in revenues and the county's reserve balance is relatively low compared with other New Mexico counties.

Baseline Socioeconomic Projections

For purposes of evaluating the potential socioeconomic impacts of commercial wind power development on Quay County, BBC developed baseline projections of socioeconomic changes in the county through 2010. These projections provide a possible view of the future without wind energy development for purposes of comparison with wind energy impacts in Section VI of this report.

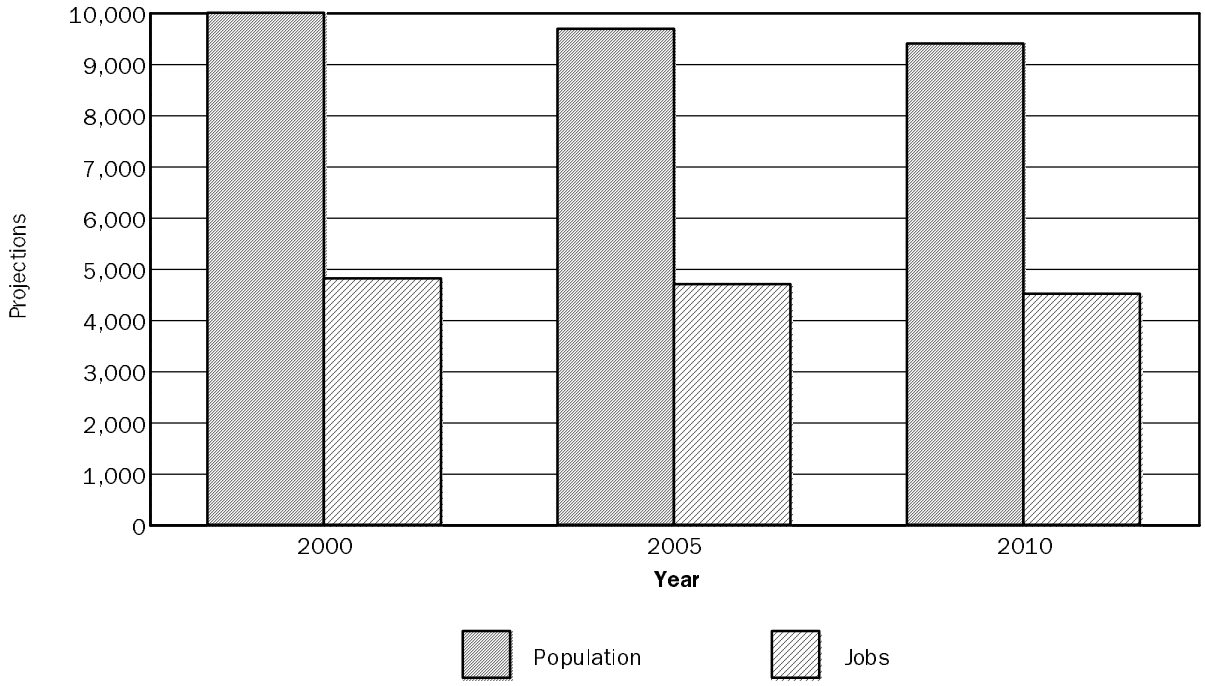
Economic and demographic projections. There is no single, official set of state or federal projections for all of the socioeconomic characteristics in Quay County through 2010. BBC's projections of Quay County population, labor force and total jobs were based on population projections for the county developed by the University of New Mexico, Bureau of Business and Economic Research (BBER).[10] To project changes in the composition of Quay County employment, BBC combined two approaches — a trend based forecast based on changes in actual employment by sector in Quay County from 1986 through 1997, and an extrapolation of short-term projections to 2003 for non-metropolitan portions of New Mexico developed by BBER.[11] These baseline projections were reviewed with local economic experts.

[10] *Population Projections for the State of New Mexico, Volume B.* Bureau of Business and Economic Research, University of New Mexico, May 1997.

[11] Historic employment by sector from the U.S. Bureau of Economic Analysis, short-term projections from *FOR-UNM: A Quarterly Economic Forecast of the New Mexico Economy*, BBER, October 1999.

Exhibit IV-16 depicts projected Quay County population, labor force and total jobs in 2000, 2005 and 2010. The general outlook is bleak, with both the county population and labor force decreasing at an annual average rate of just over one-half of a percent per year over this period. By year 2010, Quay County is expected to have about 9,400 residents, of whom about 4,400 will be in the labor force. Jobs in Quay County are expected to decrease from about 4,800 in 2000 to about 4,500 in 2010.

Exhibit IV-16.
Projected Quay County Population and Jobs, 2000 - 2010



Source: BBC projections based on New Mexico Bureau of Business and Economic Research Population Projections, 1997.

The mix of jobs in Quay County will likely continue to change over the next decade. Based on both historical trends for the county and short-term projections for non-metropolitan portions of New Mexico, it appears likely that the number of jobs in traditional energy activities (e.g., oil and gas, public utilities sectors) will decline slightly, while the largest growth will be in service sector employment. Unfortunately, these changes may also suggest a decline in average wages in the county, when adjusted for inflation, since most of the job growth will occur in relatively low paying industries. Exhibit IV-17 depicts the projected shares of Quay County employment, by sector, in 1998 and 2010.

Exhibit IV-17.
Projected Composition of Quay County Employment by Sector
1998 and 2010

	Share of Total Jobs	
Sector	**1998**	**2010**
Farm/Ag. Services	15%	14%
Mining/TCPU	6%	4%
Construction	4%	5%
Manufacturing	2%	1%
Trade	23%	22%
Service/FIRE	29%	34%
Government	21%	21%
Total	100%	101%

Note: Totals may not sum to 100% due to rounding.
Source: BBC estimates based on historical data and short-term projections by UNM BBER.

SECTION V.
Potential Economic And Fiscal Implications Of Commercial Wind Power In Quay County

Development and operation of a 40 megawatt commercial wind power facility could have a number of implications for Quay County. This final section of this report provides an identification of potential impacts from wind power in the county and a broader, cost-benefit assessment of prospective wind electricity generation from the county's perspective.

The impact estimates and cost-benefit assessment presented in this section are based upon the characteristics of the prototype, 40 megawatt wind facility for Quay County described in Section III and the demographic, economic and fiscal characteristics of the county, described in Section V. This assessment provides a reasonable view of potential impacts, benefits and costs under the assumptions provided in those two sections. Actual effects if a commercial wind project is ultimately developed and operated in Quay County may well differ from these prospective estimates due to specific characteristics of the actual project — including size, final location, specific characteristics of the localized wind resource and terms of agreements between the county, the wind power developer and the power purchasing electric utility.

Prospective Economic and Demographic Impacts

To identify potential impacts of a commercial wind facility on Quay County economic output, jobs and employee earnings, BBC applied the direct economic stimulus from the wind facility described in Section III to an input-output model of the Quay County economy. The IMPLAN model was selected for use in this study because it combines county specific economic parameters with a consistent framework for analysis in all five county reports and the statewide report. The purpose of the model, in the context of this study, is to estimate "multiplier" effects – the additional economic activity that occurs as dollars brought into the Quay County economy due to construction and operation of the wind facility re-circulate among local residents and businesses.

Construction Impacts. Building and installing a 40 megawatt, commercial wind power facility in Quay County would be a major construction project, with a fairly short duration. Over a period of six months to one year, an average of 30 to 50 workers, along with other contractors, are likely to be on-site, with a peak workforce of 75 or more people. As many as 500 30-ton truckloads of material are likely to carried to the site.

In total, the construction cost of a 40 megawatt wind facility in Quay County is estimated at approximately $44 million. A substantial portion of this cost (estimated at about $33 million), however, reflects the purchase of specialized wind power components which are not manufactured in Quay County. Most of the remaining construction costs will likely be spent on goods, labor and services obtained within the county, however. Major purchases that can likely be partly or entirely procured locally are described below:

- Construction of roads, pads and foundations;
- Electrical substation, transformer and cabling equipment purchases, construction and installation;
- Project construction and management, including labor and management wages, vehicles, room and board, field office, legal services and miscellaneous local purchases;
- Construction and furbishment of the operations and maintenance facility;
- Engineering and design; and,
- Utility interconnect.

Impact on county output (sales) from construction. Including wages paid to direct employees hired for construction, development and installation of a 40 megawatt wind power facility is anticipated to have a direct impact on county output of approximately $6.8 million. Secondary economic effects – as firms providing goods and services to the wind power site and local employees earning wages from the site make further purchases from other local businesses – are expected to add another $1.6 million to county output.

Exhibit V-1 depicts estimated direct and total impacts on county output, by economic sector.

Exhibit V-1
Estimated Impacts of 40 Megawatt Wind Facility Construction on Quay County Economic Output (Sales) by Sector

Sector	Direct Impact	Secondary Impact	Total Impact
Construction	$6,260,000	$20,000	$6,280,000
Services	$80,000	$370,000	$450,000
TCPU*	$220,000	$350,000	$570,000
Wholesale/Retail Trade	$200,000	$480,000	$680,000
All Other	$0	$360,000	$360,000
Total	$6,760,000	$1,580,000	$8,340,000

*Transportation, communication and public utilities.

Impact on county employment from construction. Construction of a 40 megawatt wind power facility would directly support an estimated 74 full-time jobs for one year. This total includes 64 direct construction jobs, seven jobs in wholesale and retail trade, two jobs in services and one job in the remaining sectors. Including secondary, "multiplier" effects throughout the county, about 105 jobs would be supported for one year. In aggregate, the employment multiplier (i.e., the number of total jobs divided by the number of direct jobs) from wind facility construction is estimated to be 1.4.

Exhibit V-2 depicts estimated direct and total impacts on county output, by economic sector.

Exhibit V-2.
Estimated Impacts of 40 Megawatt Wind Facility Construction on Quay County Economic Employment by Sector

Sector	Direct Impact	Secondary Impact	Total Impact
Construction	64	0	64
Services	2	8	10
Wholesale/Retail Trade	7	16	23
All Other	1	7	8
Total	74	31	105

Impact on county employee earnings from construction. The 74 employees directly supported by wind facility construction and installation would earn approximately $1.7 million in wages and salaries during the one year development period. The average wage for this workforce is estimated at about $23,000.

Secondary wage and salary benefits throughout the Quay County economy are estimated at about $560,000 during construction of the wind facility. Given the previous estimate of 31 secondary jobs supported by this activity, the average wage for these jobs is approximately $18,000 per year. Exhibit V-3 depicts estimated direct and total impacts on county wage and salary earnings by economic sector of the employees.

Exhibit V-3.
Estimated Impacts of 40 Megawatt Wind Facility Construction on Quay County Wage and Salary Earnings by Sector

Sector	Direct Impact	Secondary Impact	Total Impact
Construction	$1,490,000	$10,000	$1,500,000
Services	$40,000	$160,000	$200,000
Wholesale/Retail Trade	$90,000	$210,000	$300,000
All Other	$50,000	$180,000	$230,000
Total	$1,670,000	$560,000	$2,230,000

Operations Impacts. Once constructed and installed, wind power facilities are lean and efficient operations requiring only a modest level of ongoing staffing and expenditures. As noted in Section III describing the prototype 40 megawatt facility, annual expenditures (excluding property taxes, land royalty and debt service) are likely to be on the order of $500,000 per year. The bulk of this money represents the salary of the crew and purchases of local goods and services.

Royalty payment. The prospective wind facility site in Quay County is located on both state and private land. The total annual royalty payment to the landowner would be negotiated, but based on similar wind projects elsewhere, an annual royalty of about $150,000 is a reasonable assumption for purposes of analysis. Based on the site layout, it is estimated that 50 percent of the royalties will go to the state and 50 percent to the private landowner. Because state royalties leave Quay County, they do not provide direct benefits to the county's economy. To the extent that the private, local landowner increases their purchasing from local businesses due to this addition income stream, further benefits would accrue to the Quay County economy.

Output impacts from operations. Direct and secondary impacts of annual wind facility operations on Quay County economic output (sales) are estimated at about $320,000. This total includes impacts from land royalty payments to the local landowner, and re-circulation of these funds. Exhibit V-4 depicts ongoing annual impacts on county output by sector.

Exhibit V-4.
Estimated Impacts of 40 Megawatt Wind Facility Operations on Quay County Economic Output (Sales) by Sector

Sector	Direct Impact	Secondary Impact	Total Impact
Wholesale/Retail Trade	$90,000	$10,000	$100,000
Services	$70,000	$20,000	$90,000
Finance, Insurance and Real Estate	$40,000	$10,000	$50,000
TCPU*	$20,000	$20,000	$40,000
All Other	$20,000	$20,000	$40,000
Total	$240,000	$80,000	$320,000

*Transportation, Communications and Public Utilities

Employment and earnings impacts from operations. Ongoing operations of the wind facility are anticipated to directly and indirectly support about ten jobs. When the private landowner royalty payment is included, ongoing operations would support a total of about eleven jobs. Total annual employee earnings are estimated at about $360,000 for the eleven positions directly or indirectly supported by annual wind facility operations and royalty payments.

Tourism. Commercial wind power facilities are visual landmarks and of considerable interest to a number of people. One wind facility in the Midwest is planning on constructing a visitor kiosk and possibly a conference room in the near future to

capitalize on visitor interest, while other wind facilities provide periodic tours with interested visitors bussed to the site. New Century Energy reports receiving many phone calls since a television station in Denver began broadcasting live camera shots from the facility during the nightly news.[1] To the extent that green pricing programs take hold, where consumers can choose to pay more to receive electricity from a renewable source, visitor interest in wind facilities may continue to grow.

Wind facilities are likely to generate the most interest from tourists, and largest number of visitors, when they are proximate to an area with other tourist attractions or near a major population center. With the high number of travelers on I-40 passing within 15 miles of the Mesa Redonda site, the wind farm may offer an opportunity for Quay County to keep a larger portion of these travelers overnight in Tucumcari.

Unfortunately, while there seems to be some growing interest in wind projects from a tourist standpoint, there is little or no data on the magnitude of this phenomenon. Consequently, the study team was unable to quantify potential economic impacts from this source.

Impacts Relative to Baseline. In comparison to the overall size of the Quay County economy, the output, employment and wage and salary earnings stimulated by construction of a 40 megawatt commercial wind farm are not overwhelming. If the project were constructed in year 2002, wind farm directly and indirectly supported employment of about 105 jobs would represent a little more than two percent of total county employment. Effects of ongoing operations of the facility are even more modest in comparison to the county economy as a whole.

These aggregate statistics tell only a part of the story, however. As noted in Section IV, the Quay County economy has been declining for many years and job opportunities are very limited. Jobs constructing and operating the wind facility would assist in diversifying the local economy away from its heavy dependency on the service and retail trade industries and offer workers higher paying jobs in construction and maintenance.

Exhibit V-5 depicts annual jobs supported, directly or indirectly, by the wind facility relative to projected new jobs added to the Quay County economy each year without wind farm development. For certain sectors, the wind facility would either diminish expected job loss or represent a substantial portion of new jobs in the county – especially during the construction phase.

[1] Conversations with Enron Zond, New Century Energies and other wind industry sources, March 2000.

Exhibit V-5.
Comparison of Employment Impacts from Construction and Operation of 40 MW Wind Facility and Baseline Job Growth (Decline) in Quay County

Sector	Baseline New Jobs/ (Jobs Lost) per Year	Jobs Stimulated by Wind Facility Construction (One Year Only)	Jobs Stimulated by Wind Facility Operations (Annual)**
Construction	3	64	0
Services/FIRE	14	10	3
Wholesale/Retail Trade	(11)	23	4
TCPU*	(11)	1	4
All Other	(25)	7	0
Total	(30)	105	11

*Transportation, Communications and Public Utilities

**Includes jobs stimulated by royalty payment, if applicable.

Prospective Fiscal Impacts

In addition to the economic benefits just described from construction and operation of a commercial wind facility in Quay County, such a facility could be an important source of additional tax revenue to the county. The following discussion provides estimates of the potential tax revenues that would accrue to Quay County from gross receipts taxes and property taxes based upon the full application of current tax rates. In some cases across the U.S., local governments have sought to encourage development of wind facilities in their jurisdictions by abating or reducing the tax burden on the wind project developer. If Quay County opted to provide these types of incentives, the fiscal benefits would be correspondingly reduced from the estimates provided herein.

Property Tax Revenues. Traditional energy properties (e.g. coal, oil and gas) are centrally assessed throughout New Mexico by the State government. However, it is unclear from current statutes that a commercial wind farm would fall under such central assessment.[2] For purposes of this analysis, we have assumed that a Quay County wind facility would be assessed like other commercial property in the county.

Based upon the estimated $22 million construction cost of the wind facility that would occur on private land, the initial taxable value would be approximately $6,200,000 based on Quay County assessment procedures.[3] Given Quay County's operational property tax rate of 11.850 mills for the location and property type, the wind facility would initially generate about $74,000 in property tax revenues per year to support county operations. Given Quay County's currently budgeted revenues from property taxes of about $880,000, this additional source of revenue would appear to provide a significant benefit. Additional property tax revenues would also be generated for the local school district and any other entities with property taxing authority over the site.

[2] Interview with Laird Graser, New Mexico Department of Revenue, February 2000.

[3] Assessed value would be approximately 85% of market value (construction cost) and taxable value would be 1/3 of assessed value based upon interviews with Quay County Officials, May 2000.

Property taxes would decline over time as the facility is depreciated. Based upon a twenty year facility life, the property taxes paid to the county would decrease by about five percent per year.

Gross Receipts Tax Revenues. All value built into the facility during construction would also be subject to gross receipts taxes on a one time basis. The applicable gross receipts tax rate at the wind facility site is 5.625 percent, implying a gross receipts tax benefit of about $2.5 million based upon the estimated construction cost. However, most of this benefit (about $2.19 million) would accrue to the State of New Mexico. Quay County's share, based on its 0.25% portion of the GRT, would be about $280,000.

Modest increases in gross receipts taxes would also be expected as a result of the additional economic activity stimulated by construction and ongoing operations of the wind facility. Based upon the economic impacts described earlier in this section, another $50,000 in gross receipts tax revenue might be generated by increases in local trade and service activity during construction, with this benefit diminishing to less than $10,000 per year from ongoing operations. Again, however, most of this benefit would accrue to the State of New Mexico and the benefits to the county from these sources would be quite small.

Exhibit V-6 summarizes projected annual property tax and gross receipts tax revenues from wind facility construction and operation in Quay County through the first ten years of operations.

Exhibit V-6.
Projected Impact of Wind Facility Construction and Initial Years of Operations on Quay County Revenues*

Year	Property Taxes	Gross Receipts Taxes**	Total
Construction		$280,400	$280,400
Year 1		$800	$800
Year 2	$73,600	$800	$74,400
Year 3	$69,900	$800	$70,700
Year 4	$66,400	$800	$67,200
Year 5	$63,100	$800	$63,900
Year 6	$59,900	$800	$60,700
Year 7	$56,900	$800	$57,700
Year 8	$54,100	$800	$54,900
Year 9	$51,400	$800	$52,200
Year 10	$48,800	$800	$49,600
Total	$544,100	$288,400	$832,500

*Reflects only impacts from County Operational property tax levy. School districts and other taxing entities would also benefit.

**GRT reflects only the county's 0.625% rate. Benefits to the state from its 5% GRT would be much greater and are not shown here.

Potential Costs. Construction and operation of a commercial wind facility in Quay County is unlikely to impose substantial fiscal costs upon the County. In fact, there are virtually no pre-defined, explicit fiscal costs associated with the facility. County staff would, however, undoubtedly invest a fair amount of time and effort during the permitting and design process. Potentially, there could be some cost in road wear and tear from construction — although identifiable damage is usually the responsibility of the wind developer and repaired at their expenses. As discussed earlier, the county might opt to contribute in some fashion to project construction to encourage wind development, though this is probably more likely to occur in the form of tax abatements or reductions.

Overall Assessment of Costs and Benefits from Quay County Perspective

As described earlier in this section, construction and operation of a 40 megawatt, commercial wind power facility in Quay County would have positive impacts on the county economy and fiscal circumstance. During the year of construction, this project would provide a fairly substantial increase in county employment, sales and employee earnings. Ongoing economic effects from operations are much more modest, although the project could generate a substantial and stable increase in property tax revenues from the site.

Potentially, a Quay County wind facility could generate other less quantifiable benefits, or costs, depending on individual perspectives. Nearly 60 units, consisting of 80 foot blades atop a 180 to 200 foot tall tower, will certainly provide a visual landmark for the surrounding area. Potentially, the site may attract visitors, or at least divert travelers through the area to spend more time Quay County. In many rural areas, wind facilities are a source of community distinction and pride, although some may view them as a visual nuisance.

Perhaps the strongest economic argument in favor of a wind farm in Quay County is that while the benefits will not revolutionize the county's economy, they come at very little cost. Exhibit V-7 provides an overall comparison of economic costs and benefits.

Exhibit V-7.
Cost-Benefit Assessment of 40 Megawatt Wind Power Facility from Quay County Standpoint

Benefits	Costs
Short-term (construction)	**Short-term (construction)**
Over $8 million in county sales	Potential participation in road improvement and construction
100+ jobs supported for year 1	Administrative time and effort from County staff
Over $2 million in wages and salaries	Road congestion, wear and tear
Gross Receipt tax revenue of over $280,000 to County.	
On-going (operations)	**On-going (operations)**
Over $300,000 in county sales/year 10 new jobs	Visual eyesore to some residents?
Over $50,000 per year in new property tax revenue	
Visual landmark and possible source of community distinction	
Potential additional tourist interest and spending in Quay County	