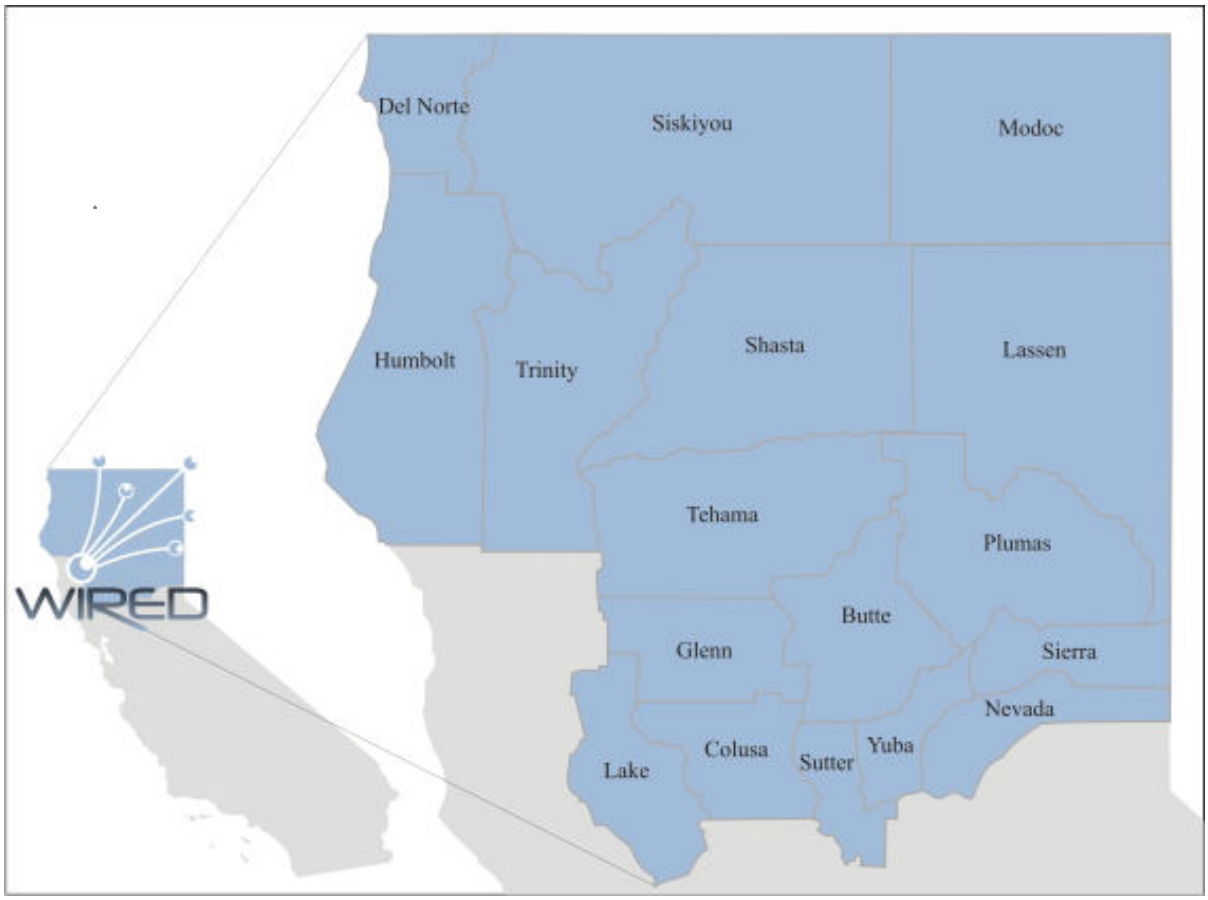
Northern California Regional Competitiveness Network
Industry Cluster and Entrepreneur Study

Executive Summary



Prepared by:

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Employment Development Department
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INTRODUCTION

The following is a summary of the previously prepared industry cluster study and entrepreneur analysis prepared by the Employment Development Department's (EDD) Labor Market Information Division (LMID) to support the Northern California Regional Competitiveness Network (NCRCN) Workforce Innovation in Regional Economic Development (WIRED) project for the 17-county region including Butte, Colusa, Del Norte, Glenn, Humboldt, Lake, Lassen, Modoc, Nevada, Plumas, Shasta, Sierra, Siskiyou, Sutter, Tehama, Trinity, and Yuba Counties.

The study was prepared at the request of the NCRCN core planning group consisting of representatives from Northern Rural Training Employment Consortium (NoRTEC), North Central Counties Consortium (NCCC), Humboldt County Workforce Investment Board, Golden Capital Network (GCN), and Northeastern California Small Business Development Center (NECSBDC). In a separate component of the WIRED project, the region seeks to create a private-sector network of local investors to provide capital for entrepreneurs to expand to larger markets. The region's Workforce Investment Boards, Small Business Development Centers, and regional economic development organizations support these efforts.

The NCRCN's core planning group identified the targets of opportunity industry clusters for this study. Clusters of opportunity are industry groups with similar, related, or complementary businesses linked by core products or services. These businesses are economically interdependent and may have common supply chains, labor needs, technologies, and markets.

This study provides a new resource in economic and workforce development planning and a bridge connecting economic and workforce policies and programs at the regional level and uses the California Regional Economies Project industry study approach to identify industry clusters that demonstrate expanding opportunity (job and/or firm growth), job quality (wage growth), improving competitiveness (strong or growing specialization, concentrated employment)[1], and career potential (job opportunities at entry, mid, and high wage levels).

The targets of opportunity industry clusters include:

- Health
- Agribusiness
- Niche Manufacturing
- Information Technology
- Renewable Energy and Energy Efficiency

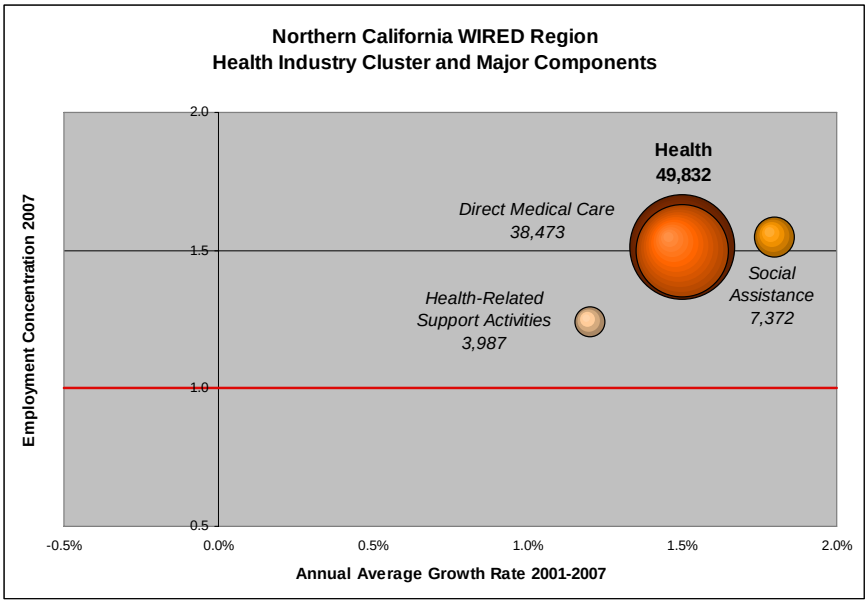
The Entrepreneur analysis includes:

- Small Business
- Businesses Without Employees (Nonemployers)[2]

[1] One statistical measure of the concentration of a local industry is the location quotient. Location quotients (LQs) are ratios that allow an area's distribution of employment by industry to be compared to a reference area. For the purposes of this study, the reference area is the State of California, and the terms location quotient and concentration are used interchangeably. A concentration greater than 1.0 indicates a higher concentration of jobs within the region than is found statewide.
[2] The U.S. Census Bureau defines nonemployers as mostly self-employed individuals operating very small unincorporated businesses with no employees, which may or may not be the owner's principal source of income.

HEALTH INDUSTRY CLUSTER SUMMARY

The Health industry cluster is the largest of the clusters studied. Accounting for nearly 18 percent of total regional employment with 49,832 jobs and 3,307 firms in 2007, the cluster is one of the region's primary economic drivers, representing an increasing share of regional employment and substantially higher-than-average wages. With a concentration of 1.51 in 2007, the cluster's significance as an export industry compared to California remained essentially unchanged during the study period. The annual average Health cluster wage exceeded the overall regional average by over $7,000. The Health industry cluster essentially matched the statewide growth trend, increasing employment on average by 1.5 percent annually to add over 5,000 jobs and 248 firms to the regional economy between 2001 and 2007. The Health cluster encompasses private and government (including tribal) direct medical care, social assistance, and health-related support industries. Government comprises 6 percent of employment, 3 percent of firms, and 6 percent of the annual wages in the cluster. The majority, or 77 percent, of the cluster's employment is in *direct medical care*, 15 percent is in *social assistance*, and 8 percent is in *health-related support activities*.



Health Industry Cluster – Direct Medical Care

Source: Quarterly Census of Employment and Wages, LMID

Direct medical care, including mental health providers, is the core of the Health cluster, employing nearly 38,473 workers, or 77 percent, of cluster employment in 2007. This component, consisting of ambulatory health care services, hospitals, and nursing and residential care facilities, reported an overall annual average growth of 1.5 percent from 2001 to 2007, and average wages for over half of the groups exceeded the regional average. Of the 11 direct medical care industry groups analyzed in this report, four advanced in all three key targets of opportunity identifiers: employment, wages, and concentration between 2001 and 2007, including Offices of Other Health Practitioners; Home Health Care Services; Other Ambulatory Health Care Services; and Other Residential Care Facilities. Firm and employment declines in General Medical and Surgical Hospitals and an offsetting increase in Offices of Physicians point towards a regional shift parallel to the national movement from inpatient to less expensive outpatient and home health care.

Direct medical care employed 77 percent of the Health Care and Social Assistance workers in 2007.

Health Industry Cluster – Social Assistance

Industries in the social assistance component provide a wide variety of non-residential social assistance services directly to individuals and families, including counseling and crisis intervention, youth services, services for the elderly and persons with disabilities, community food and housing services, other emergency relief services, and childcare. Regional social assistance establishments employed over 7,300 workers in 2007, accounting for nearly 15 percent of total cluster jobs in 2007. The component grew annually on average by 1.8 percent over the 7-year period. Government establishments play a very small role in the region's social assistance services, representing less than 2 percent of firms and less than 3 percent of employment. Private and private non-profit firms provide the vast majority of social assistance services. Although the smallest of the four social assistance industry groups analyzed in this report, Community Food and Housing, and Emergency and Other Relief Services was the only group to advance in all three key targets of opportunity identifiers: employment, wages, and concentration between 2001 and 2007.

Private and private non-profit firms provide the vast majority of social assistance services within the 17-county region.

Health Industry Cluster – Health-Related Support Activities

Health-related support activities include wholesale, retail, and distribution establishments primarily engaged in the sale and distribution of health and personal care merchandise including drugs, health-care products, and sundries; special needs transportation such as ambulance services and other non-emergency medical transportation; and death care and funeral services. Altogether, health-related support activities establishments employed over 4,000 regional workers in 2007 and comprised approximately 8 percent of the Health industry cluster employment. On average, this component grew 1.2 percent annually from 2001 to 2007. Government establishments have a minor role in health-related support activities, with the exception of Death Care Services—generally small cemetery districts operated by local governments—where government represented 33 percent of total employment and 50 percent of total establishments. Of the four health-related support activities industry groups analyzed in this report, Health and personal Care Stores, the largest of the industry groups, was the only to advance in all three key targets of opportunity identifiers: employment, wages, and concentration between 2001 and 2007. Annual average wages paid by this industry group in 2007 exceeded the regional average wage.

Regional Health and Personal Care Stores paid higher than the regional average wage of in 2007.

Health Industry Trends & Outlook

As the nation's largest industry, health care provided 14 million nationwide jobs in 2006 and will generate another 3 million jobs between 2006 and 2016, more than any other industry sector. Twenty percent of all wage and salary jobs added to the national economy through2016 will be in health care.[3] Despite the global recession, California's Health Care and Social Assistance subsector continued to add jobs in 2008, gaining 42,300 statewide jobs over the 2007 annual average.[4] One of the State's fastest growing industries, the Health Care and Social Assistance industry is expected to grow 23 percent from 2006 to 2016, an increase of 307,100 jobs. Health Care and Social Assistance jobs will continue to grow for several reasons:

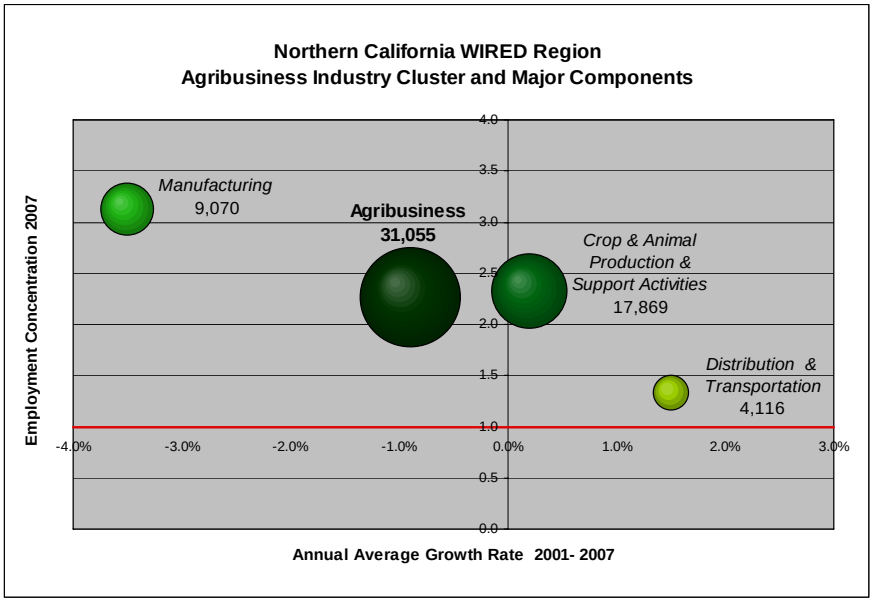
- Nationally, projected job growth in individual and family services will be due mostly to an increase in the population that will demand additional services from this sector. As baby boomers age, there is expected to be an increase in the elderly population, one of the primary segments of the populations that requires services from this industry resulting in an expansion of programs that serve the elderly, such as adult day care and home care. In 2007, both the region's disabled population and persons 65 and older were 4 percent higher than the State.[5] Services to the disabled and elderly populations are reflected within this group where, without exception, the industries are more highly concentrated than California as a whole. Additionally, an increased demand for programs aimed at assisting families is anticipated as the number of small children is expected to rise.
- Regional population growth and aging should insure continued demand and overall cluster employment growth. The number of people in older age groups who typically have much greater health care needs will grow faster than the total population between 2006 and 2016, and as a result, demand will increase. Home health care and nursing and residential care jobs will increase rapidly as life expectancies rise and as aging children are less able to care for their parents and turn to care facilities. Demand for dental care will rise due to population growth, greater retention of natural teeth by middle-aged and older persons, a greater awareness of the importance of dental care, and an increased ability to pay for services.
- In the rapidly changing health care industry, medical technology advances have made many new procedures and methods of diagnosis and treatment possible and continue to increase the survival rate of trauma patients and the severely ill and the longevity of many Americans.
- Integrated health systems will become larger and more complex, increasing the need for office and administrative support workers.
- Industry growth will also result from a shift from inpatient to less expensive outpatient and home health care because of improvements in diagnostic tests and surgical procedures, along with patients' desire for home treatment. Employment data for the Northern California WIRED Region confirms this shift.

A recent study, "Careers in Allied Health," by the Chancellor's Office of the California Community Colleges reports that while health care—one of the largest industries in northern California—is impacted by the recession, the need for quality health care services is essential and will always be in demand. As the economy recovers and more workers begin to retire, overall industry growth is expected to increase. Currently, replacement demand is expected to outpace new job growth in the majority of surveyed occupations.

[3] Bureau of Labor Statistics, Career Guide to Industries - Health Care
[4] Labor Market Information Division, California Employment Development Department, Employment by Industry Data,
[5] U.S. Census Bureau 2000, Demographic Profiles

AGRIBUSINESS INDUSTRY CLUSTER SUMMARY

Agribusiness is the second largest of the clusters studied and is historically important to the entire 17-county region. With 31,055 employees working for 2,859 firms in 2007, the cluster comprised 11 percent of total regional private employment, down from a 12 percent share in 2001. In 2007, the cluster was nearly 2.3 times more concentrated in the region than California, an indication that cluster employment is more specialized in the region when compared to the State. Annual average wages for the cluster increased 3.5 percent between 2001 and 2007, below the region's overall 6 percent wage growth, yet overall the Agribusiness cluster annual average wage exceeded the regional average, largely due to jobs in the manufacturing and distribution and transportation components. Total cluster employment declined slightly less than 1 percent annually from 2001 to 2007, or 1,937 jobs, largely due to significant employment declines in wood product related manufacturing industries. The number of regional Agribusiness firms declined by 541. The majority, or 58 percent, of the cluster's jobs are in *crop and animal production and support*, 29 percent are in *manufacturing*, and the remaining 13 percent are in *distribution and transportation.*



Source: Quarterly Census of Employment and Wages, LMID

Agribusiness Industry Cluster – Crop and Animal Production and Support

Crop and animal production and support industry groups are the foundation of the Agribusiness cluster, employing nearly 18,000 or over half of the workers in the cluster in 2007. This component experienced nearly 1 percent annual average growth, compared to a previous study that revealed a regional as well as statewide employment decline in crop and animal production and support between 1996 and 2005. Of the 10 crop and animal production and support industry groups analyzed in this report, four advanced in all three key targets of opportunity identifiers: employment, wages, and concentration between 2001 and 2007, including Vegetable and Melon Farming; Greenhouse, Nursery, and Floriculture Production; Other Animal Production; and Support activities for Crop Production. An increased availability of farm labor likely contributed to the total 1,341combined job-gain in these industry groups. Nationally, the farm sector has been less affected by the latest recession than other industries as farmers who struggled in recent years to find laborers report that former workers who left for other year-round and higher-paying jobs in such industries as construction are returning because of layoffs resulting from the current recession.

Nationally, the farm sector has been less affected by the recession than other industries.

The emergence of Vegetable and Melon Farming—the fastest growing industry within this component—may be evidence of shifting consumption, increased consumer demand for organic harvests, desire to support local producers, and growth in the popularity of farmers markets. Cattle Ranching and Farming maintained a sustainable average growth of 0.7 percent annually with top value regional crops such as heifer, steer, and stocker and feeder calf production. The regions logging and forestry industries held their position as significant export industries over the 7-year period, maintaining considerably high employment concentrations compared to the State, and logging was a top value agricultural crop in a number of counties across the region. Employment in these industries was impacted by the current economic downturn that resulted in a slowdown in the domestic housing market, a deceleration of new housing starts, and reduced demand for wood products. Increasing competition from foreign producers, consolidation, and increased mechanization of logging operations are expected to continue to depress demand for manual timber-cutting and logging workers.[6]

The growth in Vegetable and Melon Farming may be evidence of shifting consumption and increased support of local producers and demand for organic harvests.

Agribusiness Industry Cluster – Manufacturing

Agribusiness manufacturing firms employed over 9,000, or 29 percent, of the workers in the cluster in 2007. While six of the nine industry groups within the component added jobs between 2001 and 2007, manufacturing experienced an overall annual average 3.5 percent employment decline primarily due to job losses in sawmills and plywood plants. Of the nine Agribusiness manufacturing industry groups analyzed in this report, over half advanced in all three key targets of opportunity identifiers: employment, wages, and concentration between 2001 and 2007, including Electric Power Generation, Transmission, and Distribution; Grain and Oilseed Milling; Dairy Product Manufacturing; Pesticide, Fertilizer and Other Agricultural Chemical Manufacturing; and Agriculture, Construction, and Mining Machinery Manufacturing. Food and beverage manufacturers provided 982 jobs in 2007. Despite declining employment levels, Sawmills and Wood Preservation and Veneer, Plywood, and Engineered Wood Product Manufacturing combined provided jobs to 3,833 workers in 2007 and are included in the Agribusiness cluster due to their regional viability, export opportunities, and job quality. Additionally, these industries provide essential wood waste by-products in the form of mill waste and forest residuals to regional biomass power plants, contributing to the sustainability of and significant employment gains within the Electric Power Generation, Transmission, and Distribution industry.

Regional sawmills and wood-product manufacturing firms provide essential wood waste by-products to power regional biomass plants.

[6] Bureau of Labor Statistics, Career Guide to Industries, Agriculture, Forestry, and Fishing

Agribusiness Industry Cluster – Distribution and Transportation

Regional distribution and transportation industry establishments employed 4,116, or 13 percent, of the workers in the Agribusiness cluster in 2007. This component grew on average 1.5 percent annually, adding 407 jobs over the 7-year period. Wages advanced in all but two industry groups. Of the seven Agribusiness distribution and transportation industry groups analyzed in this report, three advanced in all three key targets of opportunity identifiers: employment, wages, and concentration between 2001 and 2007, including Lumber and Other Construction Materials Merchant Wholesalers; Farm Product Raw Material Merchant Wholesalers; and Other Support Services. Farm Product Raw Material Merchant Wholesalers reported a concentration of over ten times the State and increased employment by 43 percent.

Farm Product Raw Material Merchant Wholesalers had ten times greater a concentration of workers locally relative to the State share.

The distribution and transportation industries play a vital role in the Agribusiness cluster, providing vital supply chain services that ensure the prompt sale and delivery of locally grown agricultural products and perishable and time sensitive goods. Nationally, truck transportation continues to account for the bulk of freight transportation. Given the economic interdependence between the Agribusiness components, the growth encountered in particular regional crop and animal production and Agribusiness manufacturing industries has likely contributed to the overall progress seen in the distribution and transportation component. The two industry decliners in this component include Specialized Freight Trucking and Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance; however, both reported employment growth in a previous 1996-2005 study, indicative that the truck transportation and warehousing industry reflects ups and downs in the national economy. During economic downturns, the transportation and warehousing industry is one of the first to slow down as the production and sales of goods decreases and orders for shipments from producers to consumers lessens.[7] Despite employment loss between 2001 and 2007, Specialized Freight Trucking is the largest distribution and transportation industry group, employing 1,853 workers in 2007.

NICHE MANUFACTURING INDUSTRY CLUSTER SUMMARY

Niche Manufacturing, the smallest of the five industries analyzed in this study, is made up of an eclectic mix of specialized producers and wholesalers that have successfully carved out market niches for innovative products on both local and global scales. With 586 firms employing 8,648 workers, the cluster's share of total regional private employment increased to 3.1 percent in 2007—up from 2.6 percent in 2001—and accounted for 40 percent of the region's almost 21,000 total manufacturing jobs. While the cluster's concentration was lower than the State in 2007, it increased by 0.21 percent over the 7-year period, indicative of the emerging industries that are gaining competitiveness in markets outside the region. Cluster wages were 28 percent higher than regional annual average wages. Total cluster employment advanced on average by 3 percent yearly, adding over 1,600 jobs over the 7-year period, while comparable jobs declined

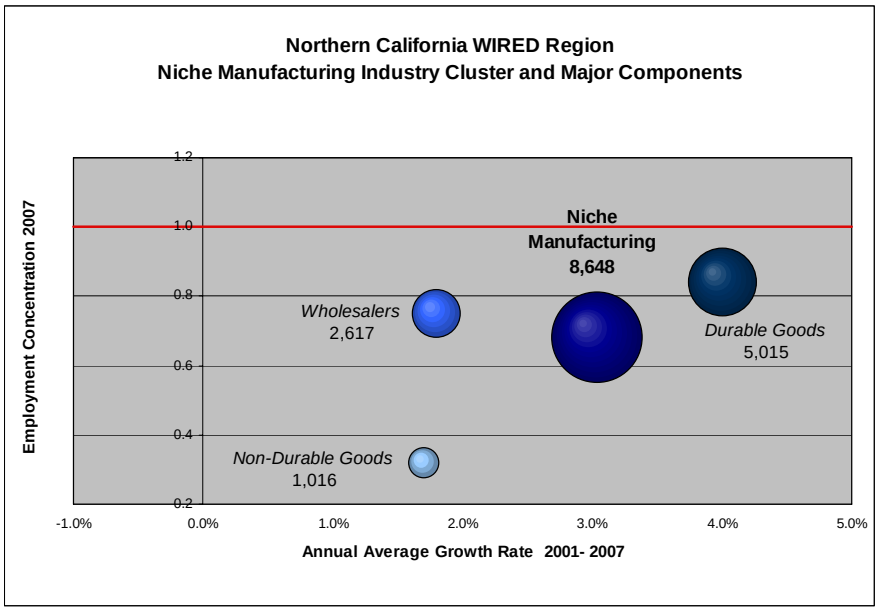
Regional Niche Manufacturing jobs increased on average 3 percent annually from 2001 to 2007, while comparable statewide industries declined, an indication of growing WIRED Region specialization and competitive advantage.

[7] Bureau of Labor Statistics, Career Guide to Industries, Truck Transportation and Warehousing

statewide by more than 100,000. The notable contrast between regional job growth and statewide decline in a majority of the Niche Manufacturing cluster industry groups, along with the cluster's 0.21 location quotient increase, is telling of the rising of regional Niche Manufacturing export-oriented establishments that sell goods and services beyond the region, representing some of the most promising economic and workforce development opportunities.

Niche Manufacturing industries are emerging as primary providers of quality replacement jobs for jobs lost among Northern California's historical resource-based manufacturing industries.

Historically, much of the region's economy, particularly manufacturing, has depended on Northern California's rich abundance of natural resources, including forests, water, minerals, and land. These resources have sustained and defined the region both socially and economically for generations; but over the past five decades, resource-based industries and employment has undergone a dramatic decline due to increasingly scarce resources, global competition, and automation. While the traditional manufacturers are still important and significant in the region, they are less-and-less the defining social and economic characteristic of many of the region's communities. Niche Manufacturing is emerging as a primary provider of replacement jobs for those lost among the region's traditional resource-based manufacturers. The growth in these industries exemplifies a cluster that is helping to reshape the region's social and economic fabric to one of diversification, innovation, and entrepreneurship. Concentrations of Niche Manufacturing industries exist throughout counties in the region. Metal products manufacturing and allied industries, the largest segment of the cluster, are found in virtually every county. Sub-region concentrations include jewelry manufacturers in the region's northwest corner, aerospace products and parts producers in the Sierras, and household and institutional furniture manufacturers throughout the Sacramento Valley. The majority, or 58 percent, of the cluster's jobs are in *durable goods*, 30 percent are in *wholesalers*, and the remaining 12 percent are in *non-durable goods.* Manufacturing industries not included in the cluster but often referred to as "niche" are likely included in other clusters within the report. For example, food, beverage (including dairy), and wood products manufacturing industries are included in the Agribusiness cluster because of their relationship to the harvested crop or common use of local resources.



Source: Quarterly Census of Employment and Wages, LMID

Niche Manufacturing Industry Cluster – Durable Goods

Durable goods are items generally with a normal life expectancy of more than three years. Major industries within durable goods include cement and concrete, mineral, metals, and furniture and cabinets producers. On the surface, industry groups in this cluster appear to be primarily manufacturers of construction-related products, but within the industries are highly specialized producers of unique and innovative products. Durable goods niche manufacturers employed over 5,000, or 58 percent, of the workers in the cluster in 2007 and experienced 4 percent annual average growth from 2001 to 2007. Of the 16 durable goods industry groups analyzed in this report, seven advanced in all three key targets of opportunity identifiers: employment, wages, and concentration between 2001 and 2007, including Clay Product and Refractor Manufacturing; Cement and Concrete Product Manufacturing; Aerospace Product and Parts Manufacturing; Other Transportation Equipment Manufacturing; Household and Institutional Furniture and Kitchen Cabinet Manufacturing; and Office and Other Furniture Related Product Manufacturing.

Niche Manufacturing Industry Cluster – Non-Durable Goods

Non-durable goods are items generally with a normal life expectancy of less than three years. Major regional industries within non-durable goods include producers of apparel, soaps and cleaning compounds, and plastics. Non-durable goods manufacturers employed more than one thousand, or 12 percent, of cluster workers in 2007, and experienced 1.7 percent annual average growth from 2001-2007. Of the seven non-durable goods industry groups analyzed in this report, three advanced in all three key targets of opportunity identifiers: employment, wages, and concentration between 2001 and 2007, including Textile and Fabric Finishing and Fabric Coating Mills; Cut and Sew Apparel Manufacturing; and Rubber Product Manufacturing. Although non-durable goods reflected both employment growth and establishment decline during the study period, the component's competitiveness increased in all industry groups with one exception, Soap, Cleaning, and Toilet Preparation Product Manufacturing, which reflected a negligible decline of less than 1 percent, an indication that non-durable goods manufacturing appears to be an emerging industry in the region. Rural regions tend to attract non-durable goods manufacturers and foster business growth due to lower labor and real estate costs, providing a more favorable business environment for new or emerging products in the early stages of development.[8]

Rural regions tend to attract non-durable goods manufacturers and foster business growth due to lower labor and real estate costs, providing a more favorable business environment for new or emerging products in the early stages of development.

Niche Manufacturing Industry Cluster – Wholesalers

Niche Manufacturing wholesale firms are essential as they provide a means to distribute manufactured goods to both local and global markets and simplify the flow of products by acting as an intermediary between the manufacturer and final customers. They provide private businesses and government agencies with a convenient nearby source of goods while simultaneously providing manufacturers with a network of distributors of their goods. In 2007, wholesalers employed over 2,600, or 30 percent, of the workers in the cluster and grew on

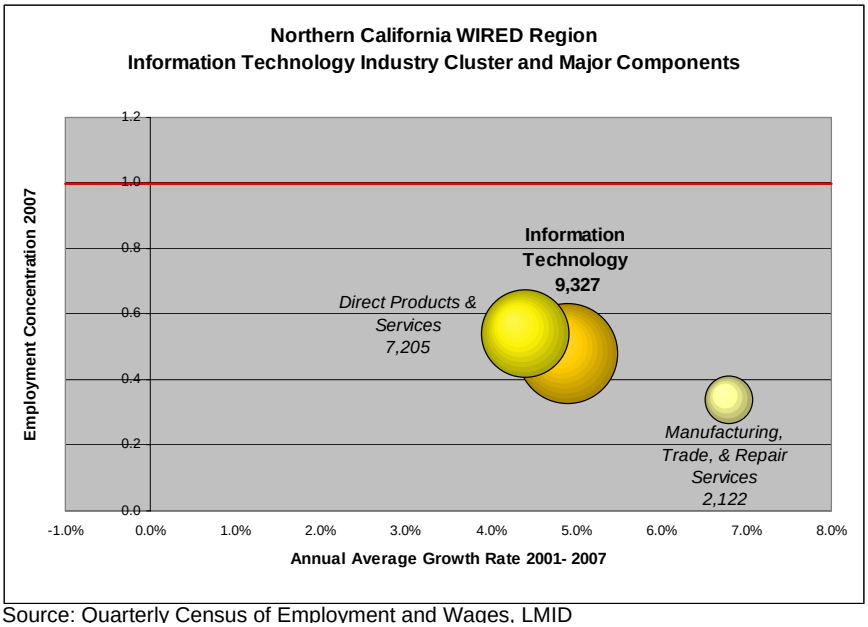
[8] Jelavich, Mark "Manufacturing and Rural Economies in the United States: The Role of Nondurable Producers, Labor Costs and State Taxes." The American Journal of Economics and Sociology (January 2001)

average 1.7 percent annually between 2001 and 2007. The overall decline in wholesale firms is likely attributable to consolidation of wholesale trade firms into fewer and larger companies. Global competition and cost pressures are likely to continue to force wholesale distributors to merge with other firms or to acquire smaller firms, a trend seen in the region and throughout the nation.[9] Of the four wholesalers industry groups analyzed in this report, three advanced in all three key targets of opportunity identifiers: employment, wages, and concentration between 2001 and 2007, including Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers; Hardware, Plumbing, and Heating Equipment and Supplies Merchant Wholesalers; and Machinery, Equipment, and Supplies Merchant Wholesalers. The construction-related wholesalers led the growth during the period and could continue to grow due to green and renewable energy activities and energy-efficiency efforts.

Global competition and cost pressures are likely to continue to force wholesale distributors to merge with other firms or to acquire smaller firms, a trend seen in the region and throughout the nation.

INFORMATION TECHNOLOGY INDUSTRY CLUSTER SUMMARY

Between 2001 and 2007, Information Technology underwent a transformation as the telecommunications industry experienced continuous technological and economic flux driven by intense competition and new technologies. Information Technology should have even wider impacts on the economy as new methods of communication—such as Internet, cellular, and broadband applications— provide businesses with new channels to reach customers and suppliers. Information Technology improves the competitiveness of other industries, adds essential infrastructure to the regional economy, contributes to rural development, facilitates rural activities, and is necessary for rural communities to attract and retain businesses and ready the workforce in order to remain economically viable. The Information Technology cluster is the third largest of the clusters. With 9,327 employees working for 1,282 firms, the cluster accounted for 3 percent of total regional private employment in 2007, up from a 2.5 percent share in 2001. Cluster employment advanced on average by 4.9 percent annually, adding nearly 2,700 jobs, and the number of firms advanced by 356 from 2001 to 2007. The cluster's concentration of 0.48 reveals that cluster employment is less specialized in the region when compared to California. The cluster's annual average wage declined over the period; however, the 2007 annual average wage of $40,642 was higher than the regional average. Industry groups within the cluster that pay less than the regional average nonetheless offer numerous



Source: Quarterly Census of Employment and Wages, LMID

[9] Bureau of Labor Statistics, Career Guide to Industries, Wholesale Trade

entry-level employment opportunities for workers through on-the-job training and vocational education. The majority, or 77 percent, of the cluster's jobs are in *direct products and services* and the remaining 23 percent are in *related manufacturing, trade, and repair services*.

Information Technology Industry Cluster – Direct Products and Services

The changing nature of Information Technology was exemplified in regional direct products and services industries between 2001 and 2007, characterized by the employment growth of Wireless Telecommunications Carriers that transmit signals over networks of radio towers to provide cellular phone, paging, wireless Internet, and video services, compared to the decline in Wired Telecommunications Carriers that provide telecommunications services via wires and cables to connect customers' premises to central offices and cable networks.[10] Nationally, Wired Telecommunications Carriers continue to make up the largest sector of the telecommunications industry, yet regional employers are feeling the global effects of an evolving telecommunications landscape. In addition to recent mergers, acquisitions, and contract work, wireless carriers are deploying new technologies to allow faster data transmission and better Internet access. Additionally, an increased number of consumers are choosing to replace traditional landline phones with wireless phones.[11] With faster Internet connection speeds, wireless carriers are selling music, videos, and other exclusive content that consumers can download on cellular phones; and the replacement of landlines with cellular service is expected to become widespread with continued advancements in transmission speed. Direct products and services employed over 7,000, or 77 percent, of the cluster workers in 2007 and experienced 4.4 percent annual average growth. Considering that regional concentration increased in all but one industry group in this component—along with Information Technology's inherent importance to the regional economic infrastructure and its firm and employment growth—the cluster is a presumptive focus as an emerging economic and workforce development target of opportunity. Of the 11 Information Technology direct products and services industry groups analyzed in this report, four advanced in all three key targets of opportunity identifiers: employment, wages, and concentration between 2001 and 2007, including Cable and Other Subscription Programming; Wireless Telecommunications Carriers (Except Satellite); Specialized Design Services; and Other Professional, Scientific, and Technical Services. Combined, regional employment for these four industry groups increased 47.5 percent, adding 681 jobs. Despite a decline in wages and concentration, Management, Scientific, and Technical Services experienced a 163 percent employment gain over the 7-year period, adding 1,522 jobs. On a national level, Management, Scientific, and Technical Consulting Services has grown rapidly over the past several decades and is projected to be one of the fastest growing industries over the next decade.[12] The increasing use of new technology and computer software is a major factor contributing to growth in all areas of consulting, as management consulting firms help clients implement new software, advise clients on the use of computer technology,

Regional employers are feeling the global effects of an evolving telecommunications landscape.

Management, Scientific, and Technical Services experienced a 163 percent gain in employment, adding 1,522 workers from 2001 to 2007.

[10] A portion of the change that characterized this cluster over the study period is attributable to recent revisions in the 2007 North American Industry Classification System (NAICS) coding system, where employees in Internet publishing and Web search portals, data processing, cable and program distribution, and telecommunications were aggregated under one industrial classification code.
[11] Bureau of Labor Statistics, Career Guide to Industries, Telecommunications

[12] Bureau of Labor Statistics, Career Guide to Industries, Management, Scientific, and Technical Consulting Services

and help design new computer systems or online distribution systems. The widespread use of the Internet and intranets has resulted in an increased focus on security, and many organizations are employing the services of security consulting firms that manage firewalls and provide protection against software viruses.

Information Technology Industry Cluster – Related Manufacturing, Trade, and Repair Services

This component is comprised of high-tech equipment manufacturers, wholesale distributors of electronic goods and agents and brokers using electronic means, and electronic equipment repair and maintenance firms. Regional information technology related manufacturing, trade, and repair services industries employed over 2,000, or 23 percent, of the workers in the cluster in 2007 and experienced overall annual average employment growth of 6.8 percent from 2001 to 2007 as increased innovation in electronics technology raised demand for the sale, distribution, and repair of electronic goods. Of the five manufacturing, trade, and repair services industry groups analyzed, two advanced in all three key targets of opportunity identifiers: employment, wages, and concentration from 2001 to 2007, including Navigational, Measuring, Electromedical, and Control Instruments Manufacturing and Electronic and Precision Equipment Repair and Maintenance. Together, these two industry groups added 153 regional jobs.

Increased innovation in electronics technology raises demand for the sale, distribution, and repair of electronic goods.

RENEWABLE ENERGY AND ENERGY EFFICIENCY INDUSTRY CLUSTER SUMMARY

The Renewable Energy and Energy Efficiency analysis provides an overview of the Renewable Energy components of the Utilities industry within the 17-county Northern California WIRED region and examines the relationship of Energy Efficiency to the Construction industry.

The Renewable Energy segment of this industry study examines establishments that generate energy from natural resources that are naturally replenished, including biomass (wood and wood waste, municipal solid waste, landfill and biogas, ethanol, and biodiesel), geothermal, hydroelectric, solar, and wind. Renewable natural resources exist throughout the region and are currently major contributors to the region's historically important mix of resource-based industries such as agriculture, logging, and wood product manufacturing. These resources are emerging during the current economic slow down and periods of energy cost volatility as an environmentally sound means to reinvigorate the regional economy while increasing the region's energy self-reliance and reducing fossil fuel consumption. Waste from agriculture and forest products for biomass plants, sustained sunshine for solar panels, sufficient wind speed for wind turbines, water flow in river and streams for hydroelectric power, and geothermal resources exist throughout the region.

Renewable natural resources are major contributors to the region's historically important mix of resource-based industries.

The Energy Efficiency segment examines establishments that assist the region's new and existing businesses, residences, and public buildings to become more energy efficient, as well as industries that develop or improve energy efficient technologies. Examples of Energy Efficiency businesses are:

- Residential and commercial contractors that install energy efficient products/materials
- Professional and engineering services that design energy efficient products/materials or perform services that reduce energy consumption
- Manufacturers of energy efficient products/materials for residential, commercial, and industrial settings

Renewable Energy and Energy Efficiency Industry Cluster – Biomass

Waste-to-energy power plants, commonly referred to as biomass power plants, use organic material to produce electricity. Statewide, biomass-produced electricity totaled 6,236 gigawatt-hours (GWh), or 2.1 percent of California's total system power in 2007. There are 132 operating biomass power plants with an installed capacity of approximately 1,000 megawatts (MW) in the State.[13] Fifteen of the plants are located within the 17-county Northern California WIRED region. These regional plants have the capacity to produce about 334 MW. Northern California biomass plants are pioneers in producing efficient, local, reliable, and environmentally sound electricity. The plants use a variety of waste by-products such as rice hulls and other agricultural waste, sawmill waste, trees harvested from forest thinning projects, and logging slash and debris to create energy to power in-house operations and provide surplus power for thousands of homes.

Fifteen of the State's 132 operating biomass power plants are located within the 17-county Northern California WIRED region. Regional plants have the capacity to produce 334 MW.

Renewable Energy and Energy Efficiency Industry Cluster – Geothermal

Geothermal energy is produced by the heat of the earth and is often associated with volcanic and seismically active regions. With California's location on the Pacific "Ring of Fire", the State has 25 known geothermal resource areas and contains the largest amount of geothermal generating capacity in the United States.[14] California has 43 operating geothermal power plants with an installed capacity able to produce about two-thirds of the nation's geothermal generation.[15] According to the Geothermal Energy Association, there are seven geothermal power plants currently operating in the Northern California WIRED Region, producing 293.6 MW of energy annually. The plants are located in two counties within the 17-county region, Lake and Lassen Counties. In addition to power generation plants, geothermal energy is used for direct-use space heating and hot water systems instead of fuel oil, electricity, or natural gas. In direct-use systems, a well drilled into a geothermal reservoir provides a stream of hot water that is brought up through the well, and a mechanical system

Regional geothermal direct-use systems supply space heating or hot water to a variety of facilities including buildings, fish farms, greenhouses, pools, and spas.

[13] California Energy Almanac, California Biomass and Waste-To-Energy Statistics & Data
[14] The California Energy Commission, Background About Geothermal Energy in California
[15] The California Energy Commission, Geothermal Energy in California

delivers the heat directly for its intended use. There are a number of geothermal direct-use systems found in the 17-county Northern California WIRED Region that supply space heating or hot water to a variety of facilities including buildings, fish farms, greenhouses, pools, and spas.

Renewable Energy and Energy Efficiency Industry Cluster – Hydroelectric

Hydroelectric power is a major source of California's electricity. In 2007, hydro-produced electricity used by California totaled nearly 43,625 GWh, or 14.5 percent of the State's total system power. The two conventional hydroelectric facilities include dams and water diversion. Dams, which raise the water level of a stream, may create secondary benefits such as flood control, water storage, and recreation facilities. Water diversion facilities usually divert water through a turbine and return the water to the channel downstream of the turbine. A total of 343 hydroelectric facilities exist in California with an installed capacity of 13,057 MW. From the California Energy Commission's (CEC) List of Hydroelectric Power Plants in California, 113 facilities, or 33 percent, were located within the 17-county Northern California WIRED Region. These plants have a combined installed capacity of 4,795 MW, or 36.7 percent of total capacity statewide. Based on the CEC's reported online MW capacity for each facility, 30 (nearly 27 percent) of the 113 hydro facilities in the region are large hydro (larger than 30 MW capacity) with a combined capacity of approximately 4,414 MW, or 92 percent of total regional capacity.

One-third of California's hydroelectric facilities exist in the 17-County WIRED region with a combined capacity of 4,795 MW or almost 37 percent of total statewide capacity.

Renewable Energy and Energy Efficiency Industry Cluster – Solar

In 2007, solar-produced electricity used by Californians totaled 675 GWh, or 0.2 percent of the State's total system power. In the 17-county Northern California WIRED Region, there are no identifiable commercial solar generation companies, and consequently there is no record of significant employment specific to solar generation. Most of the solar generation systems in the region are small and owned by individuals or businesses that produce power for their own use and, in some cases, sell excess power to local utility companies. While the Northern California WIRED Region is not identified as an area of highly concentrated efficiency based on solar resource measurements, opportunities for solar power generation exist throughout the region. Large-scale solar projects require a significant capital investment, while the smaller scale solar projects in the region allow for lower costs and easier installation of solar facilities. Solar generation of this scale is adaptable for small businesses, community buildings, residential use, and agriculture purposes such as water systems and irrigation. The vast majority of the solar-related companies identified in the 17-county Northern California WIRED Region are businesses assisting with the design, installation, and sales of solar-related products. Typically, Building Equipment Contractors, such as Electrical Contractors and Other Wiring Installation Contractors, and Plumbing, Heating, and Air-Conditioning Contractors, work in this industry. They have gained experience in the solar field as it has grown or have updated their skills through formal education in order to learn about new technology associated with solar energy development. This data is consistent with statewide research that shows 90 percent of solar-related firms are

Most of the solar generation systems in the region are small and owned by individuals or businesses that produce power for their own use and, in some cases, sell excess power to local utility companies.

non-manufacturing firms including installers, contractors, and distributors of solar energy equipment.[16]

Renewable Energy and Energy Efficiency Industry Cluster – Wind

Wind power plants are turbines that use the energy from wind motion to make mechanical energy that is converted to electricity. All of the State's commercial wind farms exist outside the 17-county Northern California WIRED Region; however, sufficient wind resource potential is found in almost all counties in the region. In the 17-county Northern California WIRED Region, there are no identifiable commercial wind generation companies and consequently no record of significant employment specific to wind generation. However, wind energy is an emerging industry in the region with proposals currently pending for commercial wind farms in Shasta and Lassen Counties. Wind power usually requires a significant investment, but there are some small-scale systems available for a lower cost. Small wind generation systems are adaptable for small business, residential, and agriculture purposes, such as water systems and irrigation. A few small-scale wind power projects exist in the region that are owned by individuals or businesses that produce power for their own use and, in some cases, sell the excess power to local utility companies; however, there are no associated employment levels available. The vast majority of wind-related companies identified assist with the design and installation of wind generation systems. Typically, Building Equipment Contractors, such as Electrical Contractors and Other Wiring Installation Contractors, and Plumbing, Heating, and Air-Conditioning Contractors comprise this industry. These contractors have gained experience in the Construction industry, developed the required computer knowledge, or updated their skills through formal education on new technology associated with wind power generation.

Wind energy is an emerging industry in the region with proposals currently pending for commercial wind farms in Shasta and Lassen Counties.

Renewable Energy and Energy Efficiency Industry Cluster – Energy Efficiency

Rebates and low-interest loans are available through most utility companies to encourage retrofits and new construction that result in Energy Efficiency. Overall, employment in the Construction industry is expected to decline statewide over the short-term, through 2009, by 5.89 percent; however, over the long-term, through 2016, Construction subsectors involved with Energy Efficiency (Building Equipment Contractors, Building Finishing Contractors, and Utility System Construction) are expected to grow by slightly less than 1 percent per year. These businesses perform home, commercial, and industrial improvement, including insulation; weatherization; lighting upgrades; replacement of inefficient windows and doors; installation of energy efficient machinery, appliances, and HVAC systems; and installation of small-scale Renewable Energy systems. As green building technology becomes more popular and affordable, contractors will develop their knowledge bases in ways that will allow them to transform large numbers of ordinary buildings into energy efficient structures.[17]

Energy Efficiency is important to the profitability of California's commercial businesses that collectively spend more than $15 billion a year on heating, cooling, lighting, and other energy uses.

[16] Center of Excellence Economic and Workforce Development, California's Solar Industry & Workforce Study Key Findings, 2008
[17] The Green Innovation Index, Next 10

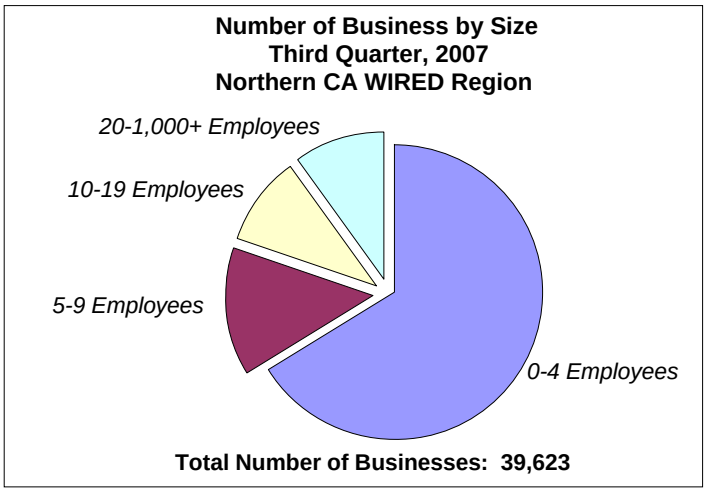
Small and medium-sized businesses within the State consume roughly 18 percent of all commercial energy. This has significant impact on the business community within the 17-county Northern California WIRED Region, where approximately 60 percent of establishments are small businesses with 1 to 5 employees.[18] Businesses establishments that implement energy-efficient measures outperform their competitors by as much as 10 percent.[19]

Business establishments that implement energy-efficient measures outperform their competitors by as much as 10 percent.

ENTREPRENEUR SUMMARY

Entrepreneur – Small Business

Research conducted by the Office of Advocacy of the Small Business Administration shows that small businesses create most of the nation's net new jobs and bring dynamic ideas, innovative services, and new products to the marketplace. The Office of Advocacy recognizes that viable small businesses are the core of sustainable rural communities. Local firms serving rural communities often have more difficulty accessing needed technology, transportation, and services, making it harder to compete in the marketplace. This study analyzes small businesses in the 17-county WIRED Region during the third quarter of 2007. At that time, there were 39,623 regional firms, and small businesses with 0 to 4 employees accounted for approximately 66 percent of total firms (compared to 68.5 percent for California). Businesses with less than twenty employees accounted for about 90 percent of total firms (compared to 89 percent for California). Together, Butte, Humboldt, and Shasta Counties accounted for nearly half of the total number of regional firms and nearly 48 percent of firms with 0 to 4 employees. Regional payrolls for all establishments totaled approximately $3.1 billion during the third quarter of 2007. Small businesses with less than 10 employees accounted for 11.2 percent of the region's total payroll.



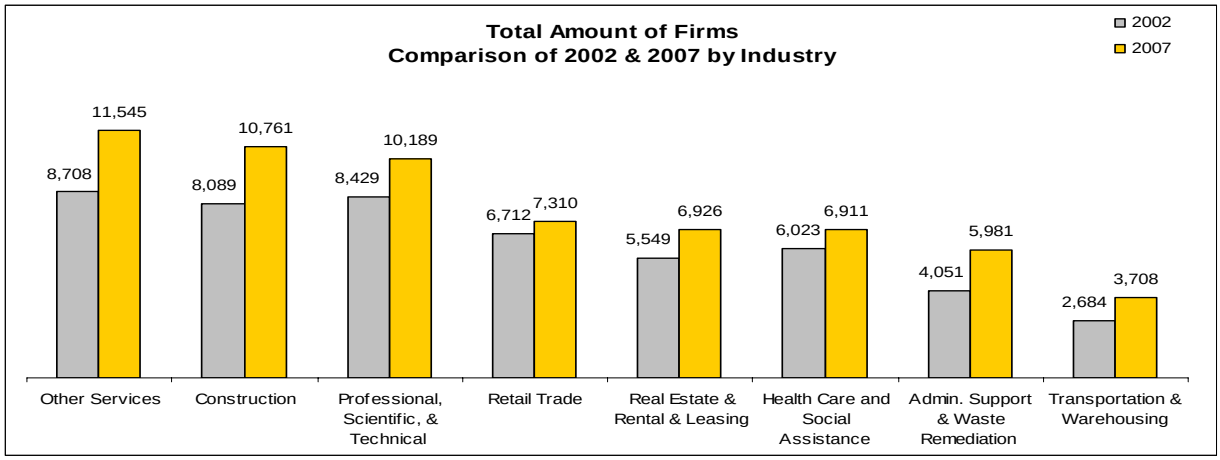
[18] EDD, Labor Market Information Data
[19] Flex Your Power, Commercial Sector

Entrepreneur – Businesses Without Employees (Nonemployers)

The U.S. Census Bureau tracks nonemployer firms with no paid employees that are subject to federal income tax. These statistics include self-employed individuals, sole proprietors, very small-unincorporated businesses, partnerships, and corporations with no paid employees.[20] This study focuses on industry sectors in the 17-county Northern California WIRED Region with receipts in excess of $100 million.

Entrepreneur – Businesses Without Employees (Nonemployers) 2002-2007 Firm Data Analysis

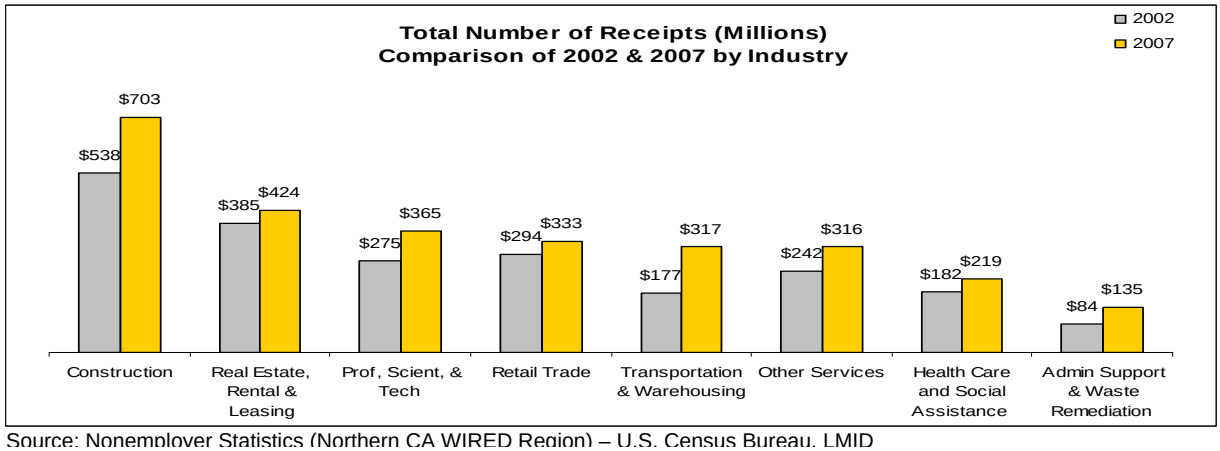
Generally, a firm is a single physical location where business is conducted or services or industrial operations are performed. However, for nonemployers the U.S. Census Bureau counts each distinct business income tax return filed by a nonemployer business as a firm. From 2002-2007, the total number of firms grew by 26 percent.



Source: Nonemployer Statistics (Northern CA WIRED Region) – U.S. Census Bureau, LMID

Entrepreneur – Businesses Without Employees (Nonemployers) 2002-2007 Receipt Data Analysis

The U.S. Census Bureau defines receipts as gross receipts, sales, commissions, and income as reported on annual business income tax returns. From 2002 to 2007, the total amount of receipts for these eight industries grew by 29 percent.



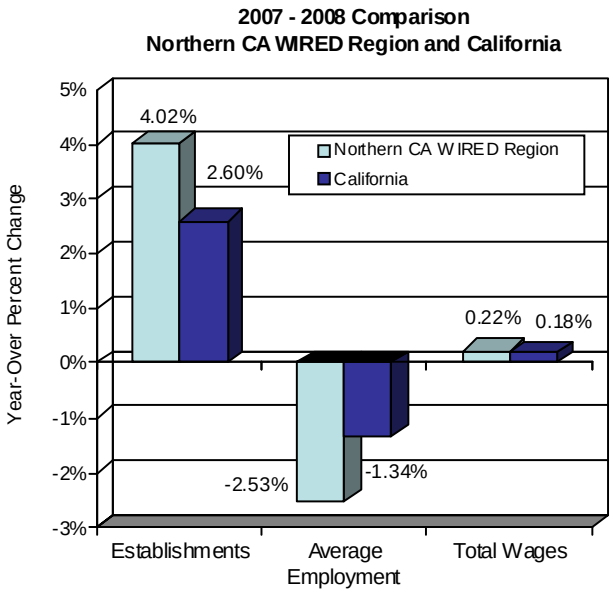
Source: Nonemployer Statistics (Northern CA WIRED Region) – U.S. Census Bureau, LMID

[20] U.S. Census Bureau, Nonemployer Statistics

CONCLUSION

Like most of the nation, California and the Northern California WIRED regional economy was gripped by a severe recession, characterized by job loss and rising unemployment following the housing bubble bursting in 2007. California's annual average industry employment fell by 177,435 jobs, or 1.34 percent, between 2007 and 2008. While the economic downturn originated in the housing and financial sectors, job losses subsequently spread into the remainder of the economy, and by the first quarter of 2009 the recession constituted the largest statewide job loss of any economic downturn since World War II.

The following chart compares the 2007 to 2008 annual average establishment, employment, and wage change between California and the Northern California WIRED Region. Overall, regional industries followed statewide 2007 to 2008 year-over trends in terms of establishments, employment, and total wages. In two of these three measures, the region grew faster than the State; regional establishments grew at a 4.02 percent rate, while California expanded by only 2.60 percent, and total regional wages grew 0.22 percent compared to 0.18 percent growth statewide. Annual average employment in the WIRED region declined by 7,009 jobs, or 2.53 percent, as compared to a statewide job loss of 177,435, or 1.34 percent. While jobs in the 17-county region declined at a slightly higher rate than California, the overall job loss amounted to only 3.95 percent of the statewide downturn.



Source: Quarterly Census of Employment and Wages, LMID

These indicators reflect significant Northern California WIRED project achievement in mitigating the current recessionary effect on the 17-county region when compared to the State. The project's success is even more compelling considering the following factors:

- The region's traditional industries—predominately timber, agriculture, cattle, and fishing—have been in decline over the past five decades.
- Unemployment rates in the region are generally higher than the average for California, and per capita income is substantially lower.
- Educational attainment rates in many of the counties are characterized by high dropout rates and large percentages of populations with less than a high school diploma.
- The region is predominately comprised of small businesses; 66 percent of private firms have less than five employees and approximately 90 percent have less than twenty (third quarter of 2007).

The Northern California WIRED goal of transforming the region by focusing on the identified industry clusters using a coordinated public/private support team for business and employment growth has clearly sustained the region since project implementation and, in particular, during the current economic downturn. The project's industry cluster focus and continued related efforts are expected to lead the region more quickly out of the current economic cycle. As a result of the project, the region has become more diversified and is particularly well positioned due to the following:

- A 17-county review of 10 industry sectors showed that nearly 60 percent increased in concentration between 2007 and 2008. The industry sectors that gained competitive advantage were predominately within the targeted industry cluster focus of this project. Almost without exception, the decline was insignificant, with only one industry dropping by a factor of one or more within an already highly concentrated county (Sierra County Natural Resources and Mining declined from 4.18 to 3.15).
- The project has helped abate historical job losses in the region's traditional resource-based industry sectors by training job seekers for new employment opportunities in targeted growth industry clusters.
- Total regional wages grew faster than statewide. This wage growth is likely to continue as project participants are trained in new industries and is a positive indication of improved economic well being among the region's workers.
- The project focus on Agribusiness, Niche Manufacturing, and Information Technology, all heavily weighted in green applications, positions the region to take advantage of increased federal investment in energy efficiency and green technologies.
- The project has nurtured a new entrepreneurial and innovative spirit within the region. Regional establishment growth at a faster rate than the statewide average is a notable project success by any measure.