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ACKNOWLEDGEMENTS

Special acknowledgements are due to all who helped establish the Wind Performance Reporting System (WPRS). The program was developed by the California Energy Commission in conjunction with the state's wind industry and the American Wind Energy Association (AWEA) and is under the direction of Sam Rashkin, Technology Assessments Manager. Data management and production assistance were provided by Stacey Luce. The cover layout and design were provided by James Maddox, Graphic Artist, Media and Public Communications Office.

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1. INTRODUCTION

The wind industry has experienced a decade of sustained development based on growth from about 500 megawatts of installed capacity at the beginning of 1985 to more than 1,655 megawatts by the end of 1992. For the first time since 1985, however, industry expansion in California has dropped to minimal levels. The sharp decline in new turbine installations during 1992 reflects the expiration of long-term interim standard offer contracts (ISO4's) with favorable rates. Industry consolidation continues as wind farms are reorganized and turbine ownership is reassigned from one project to another. Attrition of older turbines is still evident, and many turbines now operating may be nearing the end of their useful lifespan.

Although the industry profile is changing, wind energy continues to be an important renewable energy technology, representing one of the most cost effective alternative generation technologies.¹ As a result, the California Energy Commission has designated wind energy as an "opportunity" technology for electric generation, one in the state's best interest to achieve a cleaner, cheaper and more secure energy future

¹ California Energy Commission, *Energy Technology Status Report*, December 1992.

while contributing to economic development.² Worldwide attention will continue to focus on the California wind industry because of its leadership position in wind technology commercialization.

Wind industry performance in California is impressive. The more than 2.7 billion kilowatt-hours (kWh) of electricity produced by California wind operators during 1992 provided enough output to meet the annual electricity needs of more than 450,000 typical California homes. By the end of 1992, California had a generating capacity of more than 1,655³ megawatts, representing about 70 percent of the world's generating capacity and 95 percent of installed capacity in the United States.⁴

² California Energy Commission, *Energy Development Report*, December 1992.

³ Installed capacity was lower in 1992 largely due to the "fail to file" status of one operator.

⁴ California Energy Commission, *Energy Technology Status Report*, December 1992.

2. WPRS BACKGROUND

What Commission Efforts Led to the Wind Project Performance Reporting System?

The California Energy Commission (Commission) Wind Program was initiated in 1977 and later expanded in 1978 with the passage of California Assembly Bill 2976 authored by Assemblyman Henry Mello. The Mello bill required the Commission to implement a state wind energy program to expedite the commercialization of utility-scale wind turbines. The Commission was responsible for: assessing wind resources throughout California; operating a public wind information center; testing wind-electric turbines; and conducting research to support development of large-scale prototype wind turbines.

When the industry began exponential growth in 1981, the Commission and the American Wind Energy Association (AWEA) recognized the need for performance and other technology-related information. Subsequent efforts by these two organizations led to adoption of Wind Project Performance Reporting System (WPRS) regulations in 1984.

What is the WPRS Program?

California law requires the California Energy Commission to serve as a central repository in

state government for the collection and dissemination of information on energy supplies. Starting in January 1985, WPRS regulations required all California wind operators with projects rated at 100 kW or more to provide quarterly wind performance reports if they sold electricity to a power purchaser (utility). WPRS reports filed by operators include actual energy production and related project information. In addition, all California power purchasers are required to file quarterly reports documenting power purchases from wind operators. The Commission compiles and evaluates this data and documents findings in quarterly and annual reports on wind industry performance in California.

Why Were WPRS Regulations Developed?

WPRS regulations were instituted for several reasons. First, the industry, investors, financial community, and government agencies needed actual performance data to better evaluate the status of wind technology. Second, information that would help minimize tax abuse would benefit everyone involved in wind development: the industry would generate less "bad press" and more favorable public opinion; investors would be better able to make informed investments; and government and public monies would be allocated to projects with optimal performance. WPRS regulations were intended to provide performance data useful for improved government tracking of energy

supplies and better planning of the state's energy needs.

Before federal tax credits expired in 1985, project financing was primarily venture capital from private investors willing to take a substantial risk on the technology due to available tax benefits. Since the tax credits expired, wind projects have focused on revenues from power sales and placed greater reliance on conventional financing from institutional lenders and foreign investors. WPRS data also is needed to establish performance credibility with these new sources of financing.

What Information Do WPRS Reports Provide?

The WPRS Quarterly Report includes the following information for all wind projects in California rated at 100 kW or more that sell electricity to a power purchaser: turbine manufacturers, model numbers, rotor diameters and kW ratings; the number of cumulative and new turbines installed; the projected output per turbine; the output for each turbine model; and the output for the entire project. The WPRS Annual Report is a compilation of quarterly data provided by project operators and public utilities. Commission staff use this data to analyze wind project performance and industry production and capacity trends. The Annual Report also contains data summary tables reflecting performance statewide and by resource area; turbine size, type and origin; manufacturer;

and project operator. Note that totals expressed in tables and figures may not equal 100 percent due to rounding.

Since 1985, the Commission has documented and evaluated data submitted by operators and utilities in WPRS quarterly and annual reports. The extensive empirical data collected and disseminated by the Commission is used by industry, utility, investor, manufacturer, government, and research and development groups to measure the performance and relative benefits of wind technology.

What Information Is Not Found in WPRS Reports?

WPRS reports do not provide information on every wind energy project in California. Non-operating wind projects are not required to report to the Commission. The absence of a project from WPRS reports typically indicates that the project is not selling any power or is rated less than 100 kW. Other unreported capacity includes turbines that do not produce electricity for sale, such as turbines installed by utilities, government organizations and research facilities. Additional unreported capacity results when operators fail to file. Installed capacity for these operators cannot be confirmed and only kWh production verified from utility reports is included in WPRS reports.

WPRS reports cannot always account for the impact turbine age has on performance because turbines are often reported in groups combining old and new machines. To track improvements in technology, new turbine performance has been analyzed separately where possible.

The limited number of developers installing new capacity precluded adequate confidentiality of cost data. Therefore, aggregate cost data has not been included in the 1992 Annual Report.

What Limitations Should Be Considered Before Using WPRS Data?

Although many valuable observations about California's wind industry can be drawn from WPRS data, it is important to recognize four major limitations:

1) While the Commission collects and reports WPRS wind data in quarterly and annual reports, a complete industry evaluation requires consideration of collective data from several years. This is because the available wind resource varies from year to year depending on weather conditions.

2) Much of the data reported is not directly comparable because the wind industry still does not employ a standardized turbine rating system. Turbines are tested under different conditions and rated at widely varying miles per hour specifications.

3) Operator or manufacturer performance may not be accurately represented in the report when old and new turbine data are grouped together. Analysis of wind data reported since 1985 confirms that newer equipment typically performs more efficiently and reliably than older equipment.

4) Performance data contained in WPRS reports does not reflect other important variables that should be considered. These variables include: cost per kilowatt, operation and maintenance costs, durability of the system and quality of the site's wind resource.

3. WPRS IMPLEMENTATION ISSUES

WPRS implementation issues encountered and resolved are further discussed in this section.

Validating performance data. It was originally intended that utility quarterly reports be used to validate operator output data; however, numerous problems occurred. Some utilities did not provide data according to calendar quarters or provided data for only those operators who filed a power sales agreement. In many cases, more than one project was reported under a single utility contract making it difficult to verify individual project output figures.

To establish a more reliable validation procedure, Commission staff allowed operators to voluntarily submit utility receipts with quarterly reports. When output figures provided by operators agree with either submitted utility receipts or utility reported data, output figures are recorded as "validated."

Operators who fail to file. Utility quarterly reports inform Commission staff of all wind farm operators with projects rated 100 kW or more who sell power. These operators are required to submit WPRS reports. Operators who sell power but do not submit reports are noted as "failed to file." By the end of 1992, four

operators had failed to file. Depending on the circumstances, Commission staff consider various options for resolving filing issues.

Operators who file reports with missing data. Some operators filed WPRS reports with one or more data items missing. The predominant missing data item was projected quarterly output per turbine. It also appears that some wind projects were sold with only annual output estimates. In such cases, no value has been assigned. Commission staff continue to assist project operators with reporting so that data submitted will be complete.

4. CALIFORNIA WIND RESOURCE AREAS

The wind resource map on this page includes the geographical location of, and quality associated with, major wind resource areas in California. During 1992, wind performance data was received from operators with projects located in the following five resource areas:

Shown:

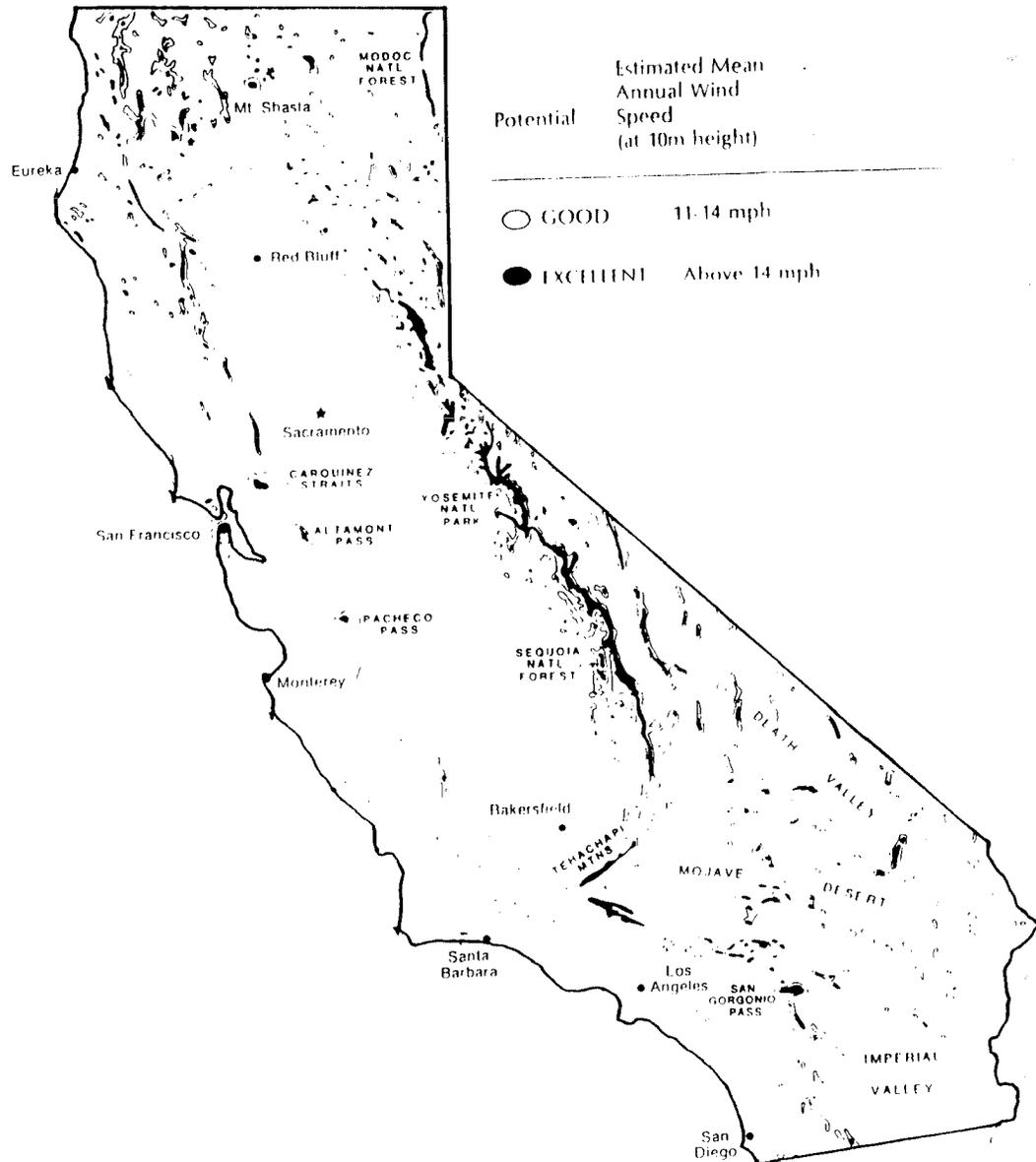
- Altamont Pass
- Pacheco Pass
- San Geronio Pass
- Tehachapi Pass

Not Shown:

- Solano (Solano County)

Areas designated "good" are roughly equivalent to an estimated mean annual power, at 10 meter height, of 200 to 300 Watts per square meter (W/m^2), and "excellent" if more than 300 W/m^2 .

Source: A. Miller and R. Simon, "Wind Power Potential in California," San Jose State University, prepared for the California Energy Commission, May 1978.



5. STAFF SUMMARY

5.A INDUSTRY PERFORMANCE

Total Capacity. A cumulative capacity of more than 1,655 megawatts was reported operational during the fourth quarter of 1992. As anticipated, industry growth measured by new turbine installations was significantly curtailed due to the expiration of long-term interim standard offer (ISO4) contracts with favorable rates. While attrition for older turbines continues to reduce total installed capacity, the decline in 1992 largely appears to be the result of unconfirmed capacity for one operator who failed to file (previously reporting approximately 21 MW of installed capacity).

Electricity Output. In 1992, the California wind industry produced more than 2.7 billion kWh of electricity, enough power to meet the annual electricity needs of almost 450,000 typical California homes.

Electricity Production Percent of Projected. Although California wind projects generate a substantial amount of electricity, the industry as a whole produced only 64 percent of the total output projected for 1992. This figure, however, compares favorably to the 45 percent of total projected output attained in 1985. Because many

wind developers overstated output capabilities during the tax credit era, a number of older turbines with overstated projections lower the total average statewide percent of output. When turbines installed since 1985 are isolated, the percent of projected output for 1992 rises to 71 percent.

Capacity Factor. Capacity factor is defined as the ratio of actual energy output to the amount of energy a project would produce if it operated at full rated power for 24 hours per day within a given time period. As indicated previously, there should be standardized testing of all wind turbines for capacity factors to be truly comparable. With no such program, wind turbine ratings currently are based on widely varying test conditions and miles per hour specifications. Voluntary standards for testing wind turbines, however, have been developed by the American Wind Energy Association (AWEA).

Despite testing limitations, the capacity factor is still considered a strong indicator of wind project performance. The annual capacity factor is computed as the average of quarterly capacity factors calculated for each group of turbines reported. Only operating turbines are used to calculate capacity factors so that performance results are not skewed by non-operational capacity. For projects with new turbines, only one-half of new capacity is included in the

capacity factor calculation during the quarter of installation because new turbines are not likely to operate for the entire quarter in which they are installed and new equipment typically needs a "debugging" period before operating at fully rated power.

The resulting statewide capacity factor for 1992 is 19 percent, representing a nearly 47 percent increase from the 13 percent capacity factors for 1985 and 1986 but a five percent decrease from 1991 (*Figure 1*). Although the 1992 capacity factor was slightly lower than the previous year, this small decrease in statewide performance may represent an off-year in wind resource quality. Nonetheless, the upper limit capacity factor continues to exceed 30 percent. In particular, one project has consistently reached this upper limit, including an annual capacity factor of 33 percent in 1992.

Note that statewide average performance is adversely affected by a substantial number of older turbines that are less reliable and efficient than those currently being installed. When wind turbines installed since 1985 are isolated, the capacity factor rises to 23 percent, about 21 percent higher than the industry as a whole (*Figure 2*).

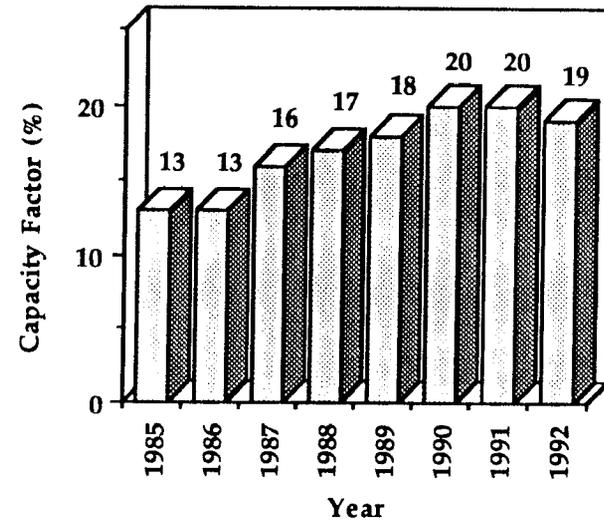


FIGURE 1: Statewide Capacity Factors 1985-1992

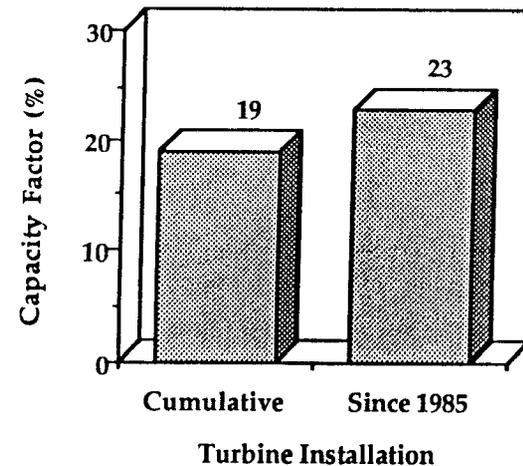


FIGURE 2: Capacity Factors for Turbine Stock

kWh Per Square Meter. Annual kWh per square meter calculations are another wind technology performance indicator. The advantage of this indicator is that it is based on blade-swept area, a wind turbine specification determined by standard measurements rather than non-standardized kW ratings used to determine capacity factors. Unfortunately, it is still difficult to develop directly comparable kWh per square meter results because data reported for some turbine models include new turbines that have not had the benefit of a full operational year. When any kWh per square meter calculation does not include a full operational year for all turbines, an asterisk has been placed next to the value on all summary tables in Section 6.

Average kWh per square meter annual production for 1992 was 683, more than 5 percent lower than the 720 kWh per square meter recorded for 1991. When turbines installed since 1985 are isolated, however, the resulting kWh per square meter annual production figure increases more than 14 percent to 780 (Figure 3).

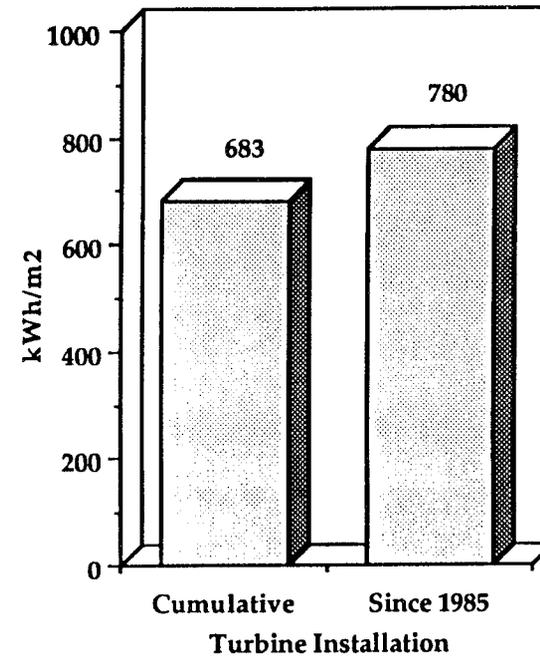


FIGURE 3: kWh Per Square Meter Production of Turbine Stock

5.B PRODUCTION AND CAPACITY TRENDS

Statewide

As anticipated, qualifying facility wind development has dropped to minimal levels because prohibitively low, short-term contract rates are the only option currently available. Only 16 MW of new capacity was installed in 1992, compared with 192 MW in 1991, 161 MW in 1990 and 64 MW in 1989. The total cumulative capacity of approximately 1,655 MW at the end of 1992 (*Figure 4*) appears to reflect the permanent retirement of some older turbines and unconfirmed capacity for one operator who failed to file, previously reporting an installed capacity of about 21 MW.

Wind output during 1992 was consistent with the typical California wind resource profile: low winds at the beginning and end of the year and high winds during spring and summer when the heating season creates a natural draw of cool coastal air into hot valleys and deserts. WPRS data indicates that 73 percent of all annual output was produced in the second and third quarters of 1992 (*Figure 5*). This is a good seasonal match to California's peak demand for electricity during summer months.

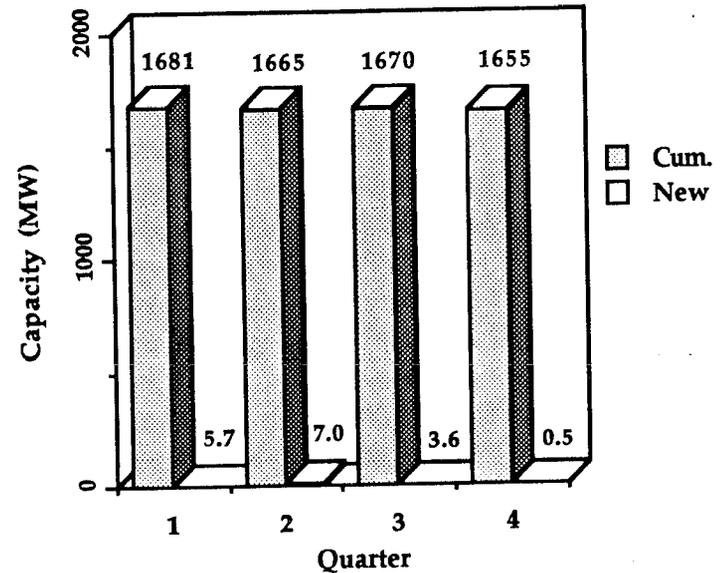


FIGURE 4: Statewide Wind Capacity

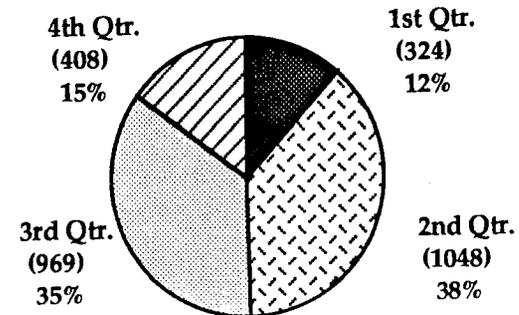


FIGURE 5: Statewide Wind Output (Millions of kWh)

The amount of electricity produced by California wind farm operators during 1992 was about the same as 1991 and compares favorably to previous years. Total output in 1992 was more than 13 percent higher than in 1990 and more than 300 percent higher than in 1985 (Figure 6). Quarterly capacity factors were consistent with the California wind resource profile previously discussed. The statewide capacity factors for 1992 were 9, 29, 27 and 11 percent respectively for the first, second, third and fourth quarters.

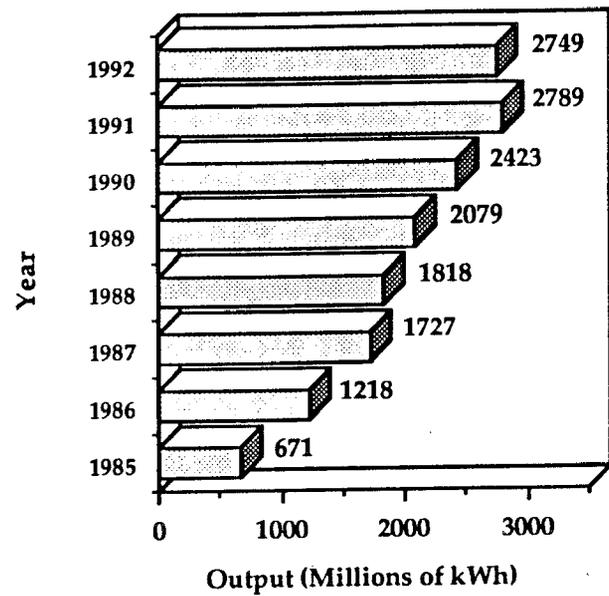


FIGURE 6: Statewide Wind Output 1985-1992

Resource Areas

Although wind project operators from five different resource areas in California reported to WPRS, more than 95 percent of all California capacity and output is generated in only three resource areas: Altamont, San Gorgonio and Tehachapi. All three of these areas are narrow mountain passes leading into hot and dry valley or desert regions. Among these three resource areas, 41 percent of all capacity is found in Altamont, 38 percent in Tehachapi and 16 percent in San Gorgonio resource areas (Figure 7).

When capacity (Figure 7) and percent of total statewide output (Figure 8) for the three primary resource areas are compared, San Gorgonio (19 percent output at 16 percent capacity) and Tehachapi (41 percent output at 38 percent capacity) produced more than their share, and Altamont (36 percent output at 41 percent capacity) produced less than its share. Pacheco and Solano resource areas produced almost exactly their shares.

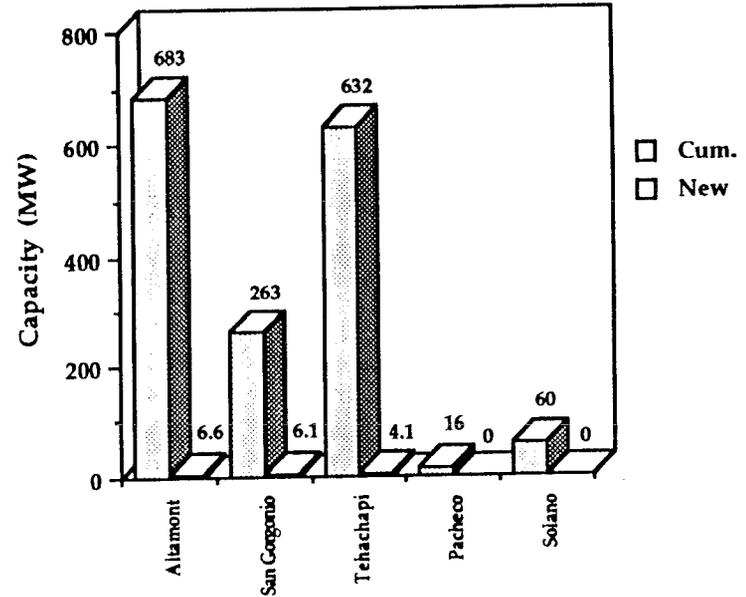


FIGURE 7: Resource Area Capacity

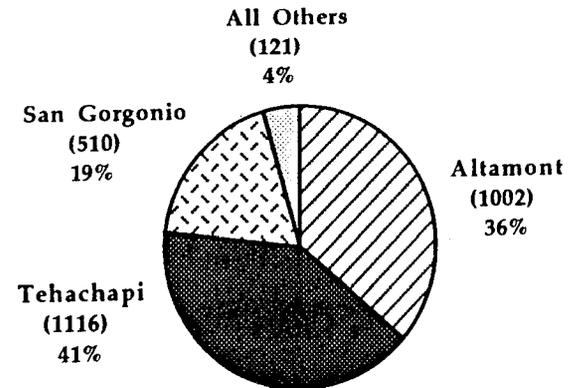


FIGURE 8: Resource Area Output (Millions of kWh)

Of the three largest resource areas, San Gorgonio had the highest capacity factor (23 percent), followed by Tehachapi (20 percent) and Altamont (17 percent). Solano and Pacheco, two smaller resource areas, had capacity factors of 19 percent and 15 percent respectively (Figure 9).

When comparing resource area performance, many factors should be considered. For example, age of equipment appears to be a significant factor affecting the performance difference between San Gorgonio and Altamont. This is because San Gorgonio equipment is newer since wind developers met substantial delays getting local government approval for their projects during early wind development years. By contrast, the Altamont resource area includes two large developers with more than 206 MW of very old capacity and only an 8 percent average capacity factor, significantly lowering Altamont's overall performance.

Another important factor is the relative value of each resource area's wind output. For example, the Solano resource area has a lower capacity factor than San Gorgonio, but production is much better matched to utility summer peak demand. For more information about time-of-use output distribution, see Section 5C.

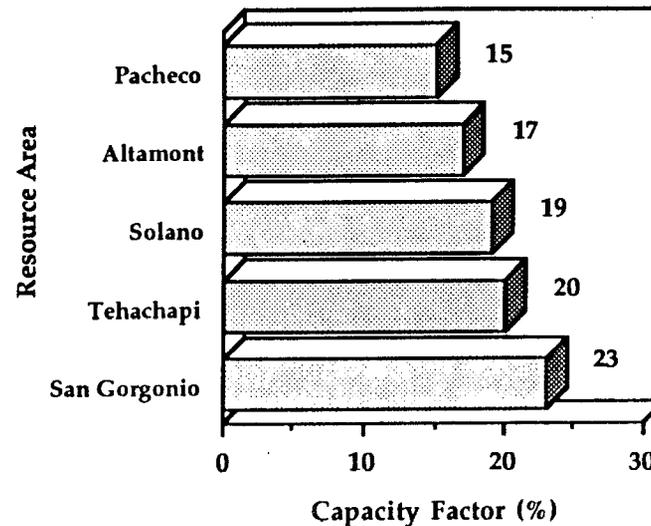


FIGURE 9: Capacity Factor by Resource Area

Turbine Size

Since the early 1980's, many industry specialists have predicted that larger turbines, including those in the 300 kW size range, would be the trend for future wind development. This trend is reflected by new turbine installations during 1992. Almost 70 percent of all new capacity installed in 1992 was in the the 200+ kW size category (Figure 10). Although the 51-100 kW turbine size still accounts for more than one-half of all cumulative capacity, this percentage share may decrease over time as smaller, older turbines are permanently retired from service.

Capacity factor performance for 1992 is highest for turbines in the 200+ kW size range (Figure 11). Further, a comparison of cumulative capacity and percent share of kWh output reveals that larger turbines in the 200+ kW range produced more than their share at 28 percent output and 25 percent capacity (Table 1).

TABLE 1
1992 CAPACITY AND OUTPUT BY TURBINE SIZE

Size (kW)	Cum. Capacity (% of Total)	New Capacity (% of Total)	kWh Output (% of Total)
1-50	3%	0%	2%
51-100	54%	0%	50%
101-150	14%	32%	15%
151-200	4%	0%	4%
200+	25%	68%	28%

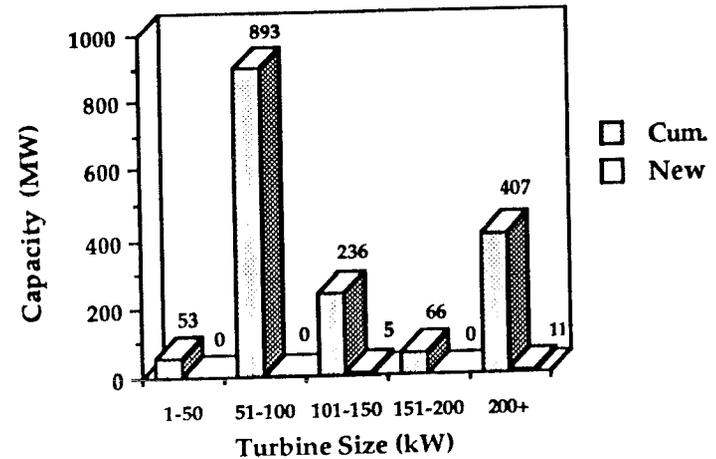


FIGURE 10: Capacity by Turbine Size

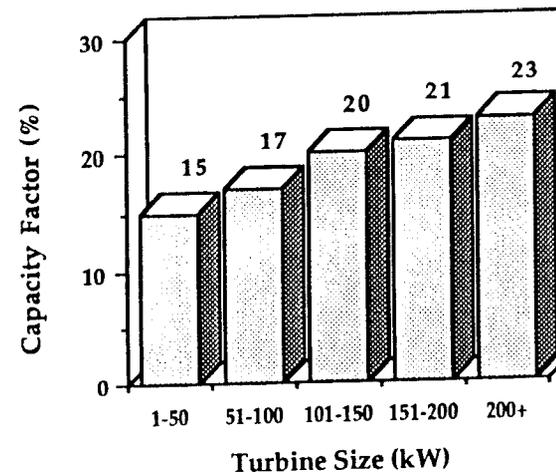


FIGURE 11: Capacity Factor by Turbine Size

A more disaggregated analysis of capacity factor performance of larger turbines in the 200+ kW size range is depicted in *Figure 12*. The 1992 capacity factor for turbines in the 400-499 kW size range was 37 percent, almost double the statewide average capacity factor. Turbines in the 200-299 kW size range had a capacity factor of 22 percent, about a 16 percent improvement from the statewide average capacity factor of 19 percent.

Larger turbines also performed well above the statewide average in kWh per square meter measures of performance (*Figure 13*). The 1,449 kWh per square meter performance of turbines in the 400-499 kW size range more than doubles the statewide average kWh per square meter of 683. The 858 kWh per square meter for turbines in the 200-299 kW size range was more than 25 percent higher than the statewide average.

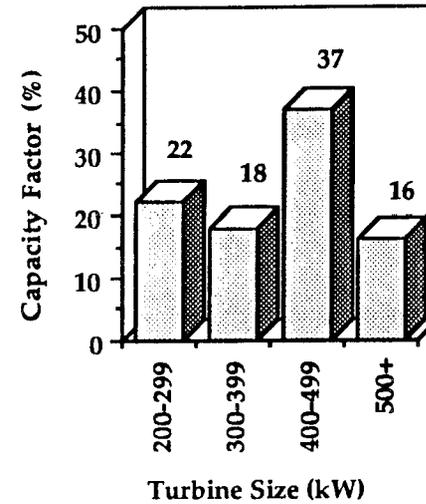


FIGURE 12: Capacity Factor 200+ kW Turbines

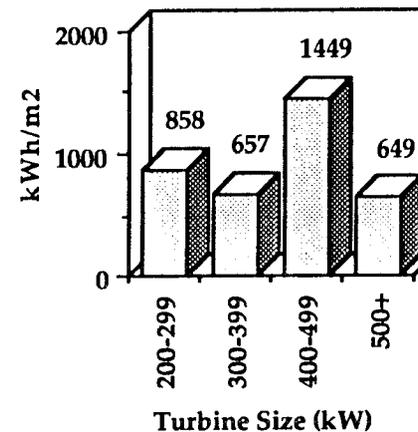


FIGURE 13: kWh Per Square Meter for 200+ kW Turbines

A comparison of capacity factor by turbine size from 1985 to 1992 shows significant improvement in all size ranges (Figure 14). Capacity factor performance in 1992 exceeded 1985 levels by the following percentages: 15 percent for 1-50 kW; 41 percent for 51-100 kW; 42 percent for 101-150 kW; 50 percent for 151-200 kW; and 175 percent for 200+ kW turbines.

A more recent comparison reveals that 1992 capacity factor performance declined slightly from 1991 levels in all turbine size groupings except 200+ kW. In 1992 the 200+ kW turbines maintained a capacity factor of 23 percent, equal to 1991 levels.

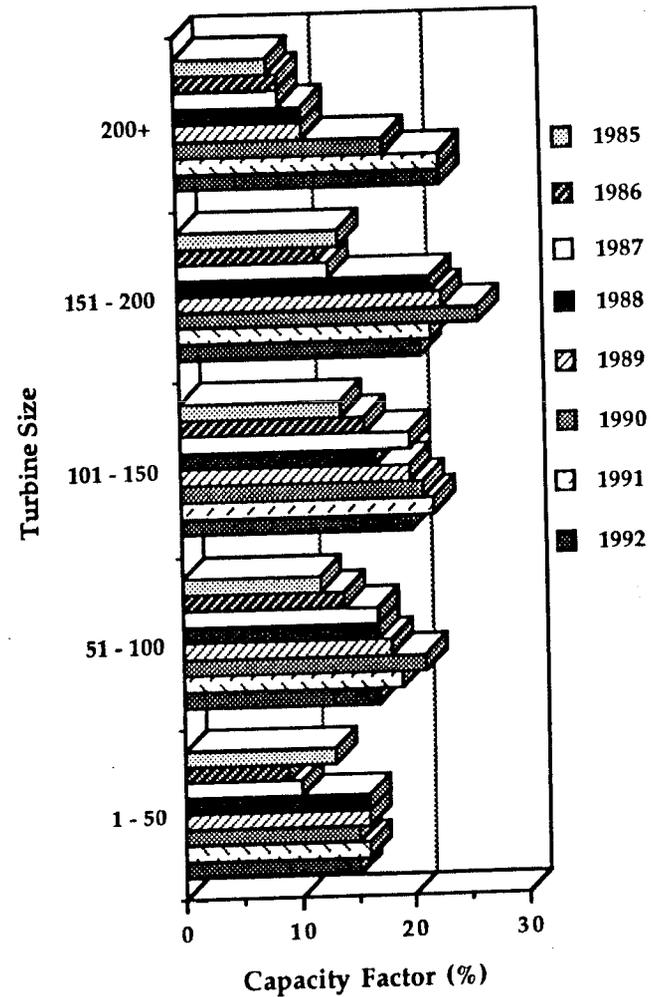


FIGURE 14: Capacity Factor by Turbine Size 1985-1992

A comparison of kWh per square meter performance by turbine size from 1985 to 1992 also shows significant improvement in all size ranges. Turbine kWh per square meter performance in 1992 exceeded 1985 levels by the following percentages: 54 percent for 1-50 kW; 84 percent for 51-100 kW; 21 percent for 101-150 kW; 13 percent for 151-200 kW and almost 300 percent for 200+ kW turbines (Figure 15).

Kilowatt-hour (kWh) per square meter production in 1992 fell below 1991 levels in all categories except 200+ kW. The 859 kWh per square meter performance of 200+ kW turbines slightly exceeded the 856 level recorded in 1991.

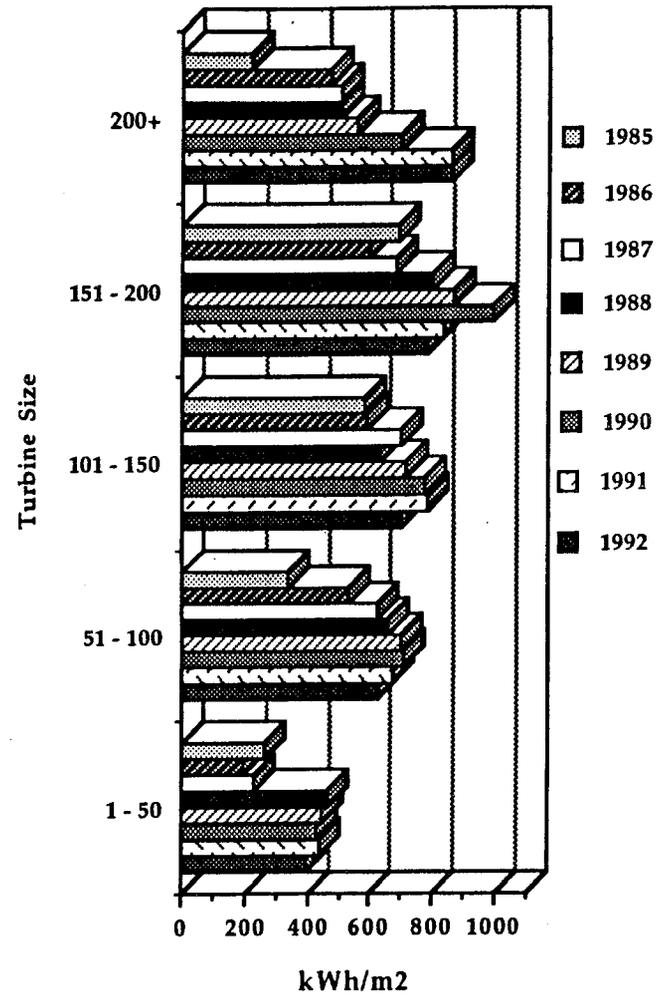


FIGURE 15: kWh Per Square Meter by Turbine Size 1985-1992

Turbine Type

WPRS performance results also have been categorized by horizontal or vertical axis machines. When comparing performance of horizontal and vertical turbines, it should be recognized that vertical axis turbines represent relatively old technology since they have not been installed in California since 1986.

The California wind industry continues to be dominated by horizontal axis machines accounting for approximately 94 percent of all capacity and 100 percent of new capacity. Comparison of performance indicates that the 20 percent capacity factor for horizontal axis turbines doubles the 10 percent capacity factor for vertical axis turbines (*Figure 16*).

Performance by kWh per square meter was more than 20 percent higher for horizontal axis turbines (688) than for vertical axis turbines (570) (*Figure 17*). The data does not explain why the variation in kWh per square meter performance between horizontal and vertical axis turbines is so much less than the difference in capacity factor performance.

Note that other important turbine characteristics such as downwind and upwind configurations, number of blades, fixed or variable pitch blades, and braking devices are not tracked in WPRS reports.

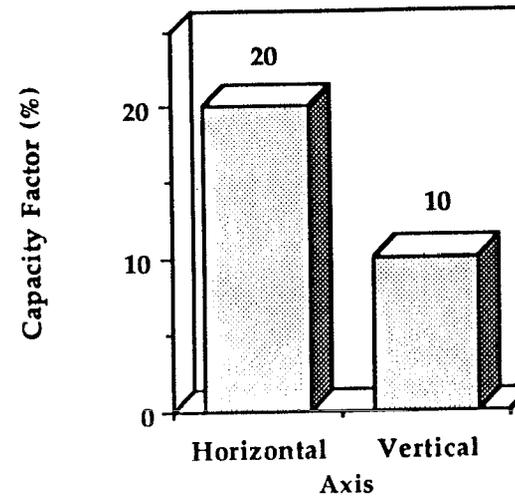


FIGURE 16: Capacity Factors by Turbine Axis

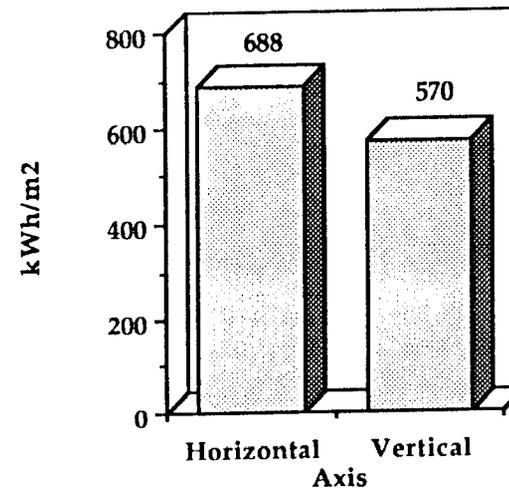


FIGURE 17: kWh Per Square Meter Production by Turbine Axis

Domestic and Foreign Turbines

By the end of 1992, foreign turbine capacity was 876 MW, compared to almost 779 MW of domestic turbine capacity. The 10.2 MW of foreign turbine new capacity in 1992 was about 55 percent higher than the 6.6 MW of domestic turbine new capacity (Figure 18).

A comparison of capacity distribution by origin for domestic and foreign turbines in 1985 and 1992 is shown in Figure 19. For a more complete historical perspective, the gradual shift from domestic to foreign turbines between 1985 and 1992 is shown in Table 2.

TABLE 2
1985-1992 CAPACITY DISTRIBUTION
BY TURBINE ORIGIN

Year	Domestic (%)		Foreign (%)	
	Cum.	New	Cum.	New
1985	67	55	33	45
1986	55	25	45	75
1987	56	49	44	51
1988	58	87	42	13
1989	52	17	48	83
1990	53	45	47	55
1991	46	4	54	96
1992	47	39	53	61

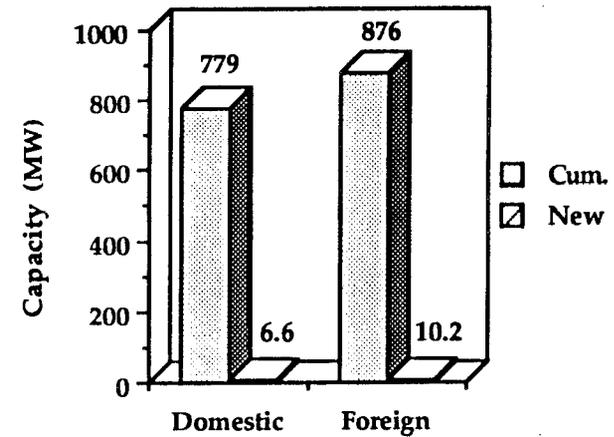


FIGURE 18: Capacity by Turbine Origin

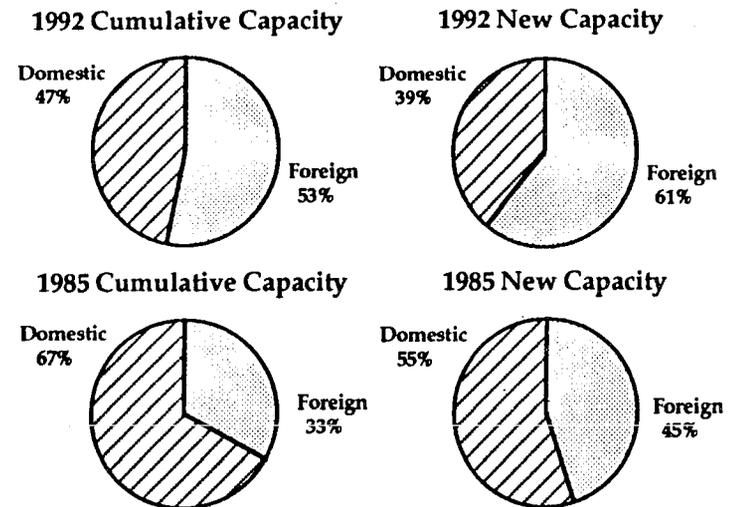


FIGURE 19: Capacity Distribution by Origin 1985 and 1992

Capacity factor results indicate that overall performance of foreign turbines exceeds domestic turbines. The 22 percent capacity factor for foreign turbines is more than 37 percent higher than the 16 percent capacity factor for domestic turbines. Although both domestic and foreign turbine bases benefit from the inclusion of newer, more efficient machines, the domestic turbine base appears to be more adversely influenced by older, less efficient turbines. For example, when turbines installed since 1985 are isolated, the performance gap decreases from about 37 percent to 10 percent. Specifically, the capacity factor for domestic turbines increases from 16 to 21 percent while foreign turbines increase from 22 to 23 percent (Figure 20). The increase for foreign turbines is much smaller because more than two-thirds of total foreign capacity has been installed since 1985.

The impact of other variables on domestic turbine performance is demonstrated by two large projects in the Altamont resource area with more than 206 MW of turbine capacity and an average capacity factor of only eight percent. Domestic turbines account for about 161 MW of the 206 MW capacity with only a three percent capacity factor. When these two projects are eliminated from the domestic turbine base, the adjusted capacity factor increases to 19 percent (Figure 21).

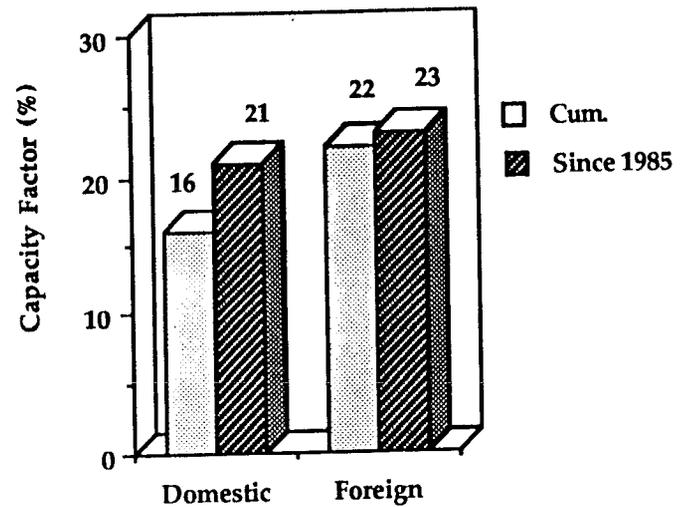


FIGURE 20: Capacity Factor by Origin

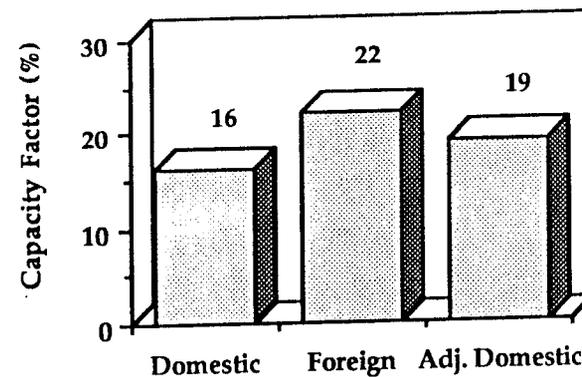


FIGURE 21: Adjusted Capacity Factor for Domestic Turbines

Analysis of kWh per square meter performance data indicates that domestic turbine performance (483) is about 32 percent lower than foreign turbines (720) without any adjustments. However, when newer turbines installed since 1985 are isolated, the performance gap narrows with domestic turbine kWh per square meter production at 735, only about seven percent lower than the 792 kWh per square meter adjusted performance of foreign turbines (Figure 22).

When evaluating performance for domestic turbines, the kWh per square meter measure is comparatively better than the capacity factor measure because overstated capacity ratings for older domestic turbine stock appear to significantly reduce capacity factor performance.

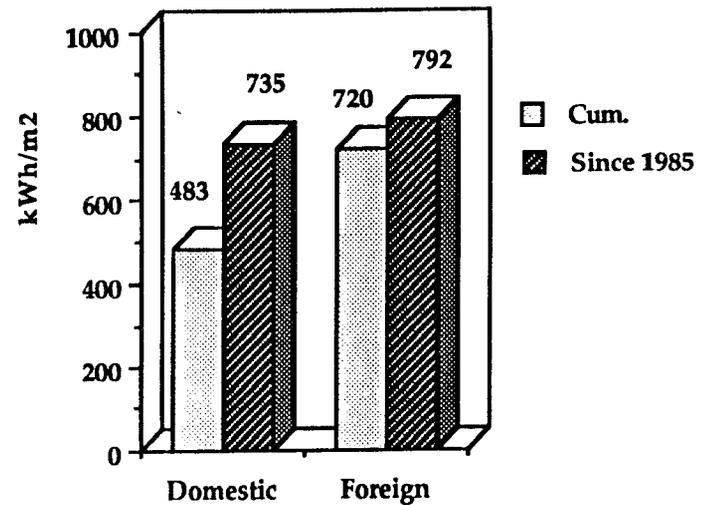


FIGURE 22: kWh Per Square Meter Production by Turbine Origin

The 10 Largest Wind Turbine Manufacturers

The 10 largest wind turbine manufacturers represent more than 88 percent of California's wind generating capacity. The five largest manufacturers alone (U. S. Windpower, Vestas, MWT, Fayette and Micon) account for more than 68 percent of all capacity. The 10 largest manufacturers and their individual generating capacities are shown in Figure 23. A wide range of capacity factors exist among these manufacturers (Figure 24). Manufacturers with the highest capacity factors are Danwin (26 percent), Bonus (25 percent), MWT (24 percent), Vestas (22 percent), Micon and U.S. Windpower (21 percent).

Both equipment and siting variables should be considered when evaluating turbine manufacturer data. Manufacturers with older turbine bases are more adversely affected relative to their total performance. The overall quality of a particular resource area also has considerable impact on reported performance of turbines sited in that area. Higher capacity factors for some specific turbine types may result from their concentration at particularly good sites within high quality resource areas.

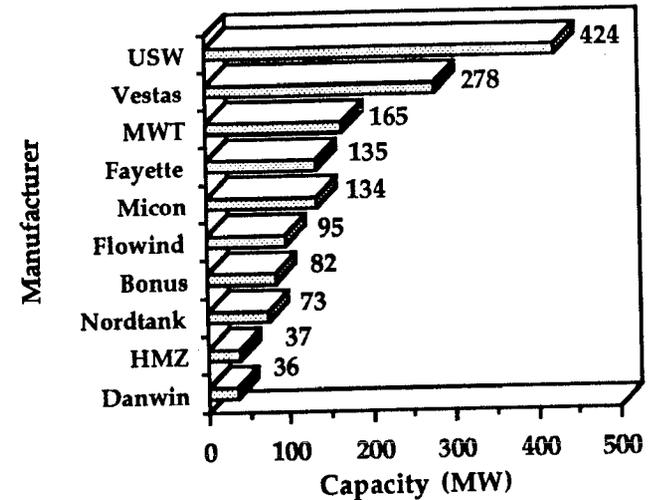


FIGURE 23: Cumulative Capacity for 10 Largest Turbine Manufacturers

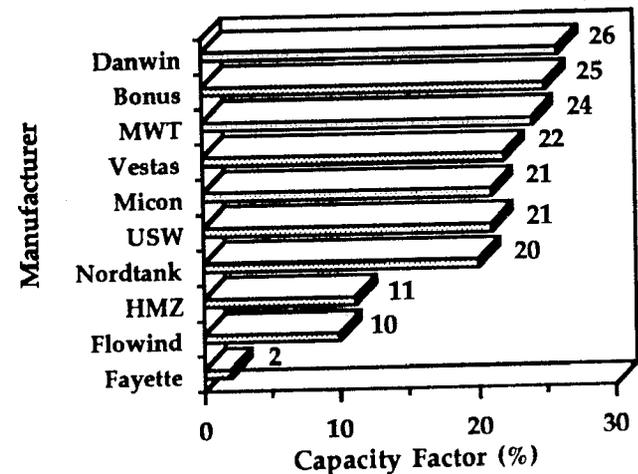


FIGURE 24: Capacity Factors for 10 Largest Turbine Manufacturers

Annual kWh per square meter results are shown for the ten largest manufacturers in *Figure 25*. Manufacturers with the highest kWh per square meter production are U.S. Windpower (890), Danwin (879), and MWT (864). In 1992, 1,454 kWh per square meter production was recorded for one smaller foreign turbine manufacturer (not shown on *Figure 25*) with an installed capacity of 14 MW.

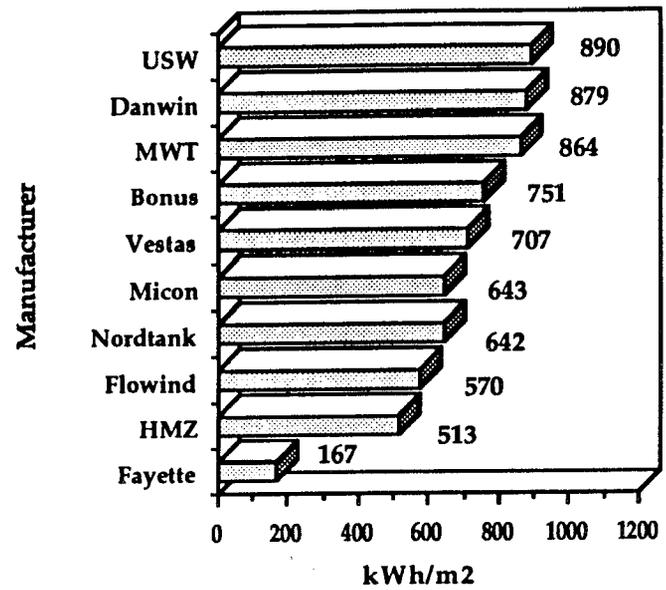


FIGURE 25: kWh Per Square Meter Production for 10 Largest Manufacturers

The Five Largest Wind Project Operators

The 1992 Annual Report continues to focus on the five largest wind project operators due to industry consolidation and growth primarily limited to major developers. The five largest wind project operators include U.S. Windpower, SeaWest, Zond, Flowind and Arcadian (formerly Fayette). These five operators account for 1,274 MW, representing more than 76 percent of total California wind generating capacity (Figure 26).

Capacity factors for the largest wind project operators are quite varied (Figure 27). Operators with the highest capacity factors are SeaWest and Zond (22 percent) and U.S. Windpower (21 percent). It should be noted that one smaller operator, San Gorgonio Farms (not shown in Figures 28 and 29), has consistently produced the highest capacity factors for every year WPRS data has been compiled and published, including a 33 percent capacity factor for 1992. This project is significant because it consistently demonstrates the impressive potential for wind technology performance when developers combine quality machines and maintenance programs with a good wind resource site.

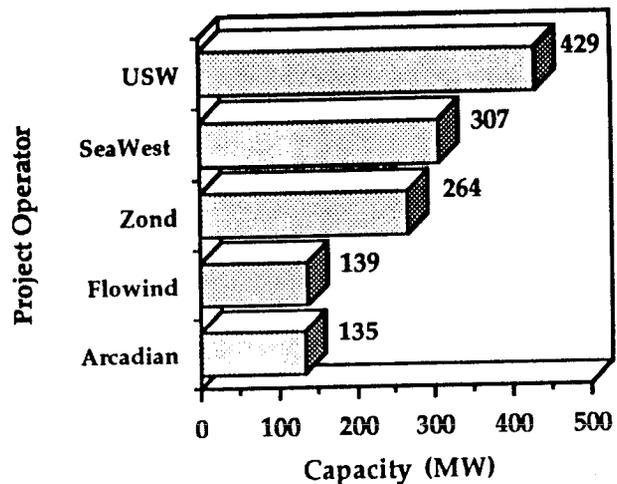


FIGURE 26: Cumulative Capacity for 5 Largest Operators

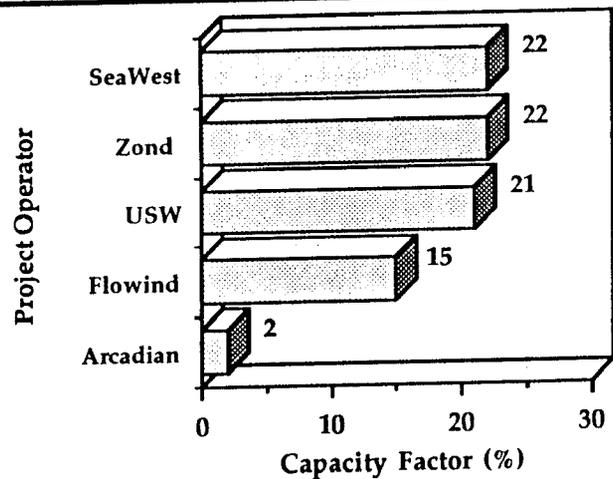


FIGURE 27: Capacity Factors for 5 Largest Operators

Annual kWh per square meter results for the five largest operators are shown in *Figure 28*. Among these operators, SeaWest (748), U.S. Windpower (747) and Zond (730) had the best performance. Of all California wind project operators, San Gorgonio Farms (not shown in *Figure 28*) had the best performance at 1,110 kWh per square meter.

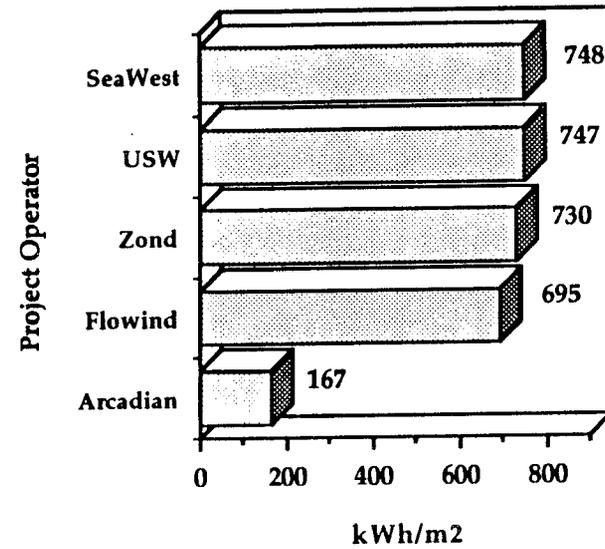


FIGURE 28: kWh Per Square Meter Production for 5 Largest Operators

5.C TIME OF USE PRODUCTION

Statewide

The distribution of wind-generated electricity during utility time-of-use periods by quarter is illustrated in *Figure 29*. This profile is based on tabulated utility billing data submitted by a majority of California wind operators.

As discussed before, annual wind energy production has an excellent match to the utility peak demand for electricity that occurs during the months of May through September. Approximately 73 percent of total annual wind output was generated during second and third quarters (*See Figure 5*). However, utility billing data indicates annual production is poorly matched to time-of-use needs on a diurnal basis.

Of total electricity generated during the utility peak demand period (second and third quarters), about 11 percent of output was produced "on peak," about 25 percent "mid-peak," 46 percent "off peak," and 17 percent "super off peak" (*Figure 30*). The percentage of electricity produced "on peak" during the utility peak demand period was the same in 1992 as the previous year.

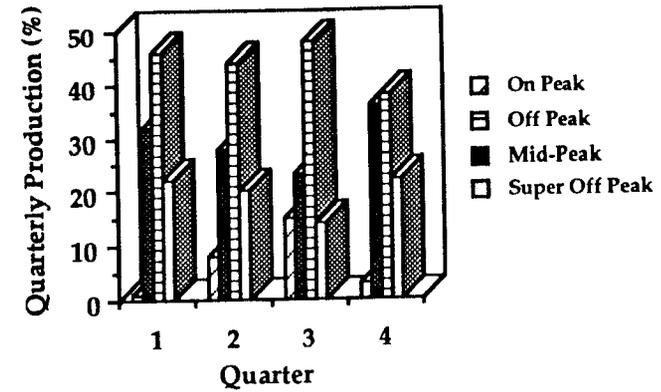


FIGURE 29: Statewide Time-of-Use Distribution by Quarter

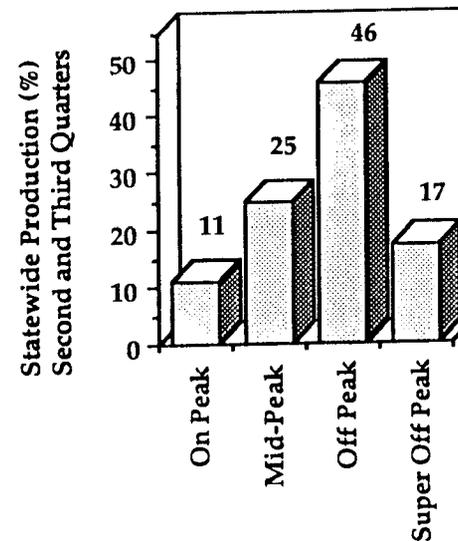


FIGURE 30: Percent of Output During Time-of-Use Demand Periods

As mentioned in Section 5B, production and capacity trends should be viewed in conjunction with time-of-use distribution, especially when comparing the performance of individual resource areas. Resource area output produced during time-of-use demand periods is depicted in *Figure 31*. In 1992, Solano (a smaller resource area) produced the greatest percentage of output "on peak" at 17 percent. This compares favorably to "on peak" production of 12 percent for Altamont, 10 percent for Tehachapi, and nine percent for San Geronio. No utility billing data was submitted for the Pacheco resource area.

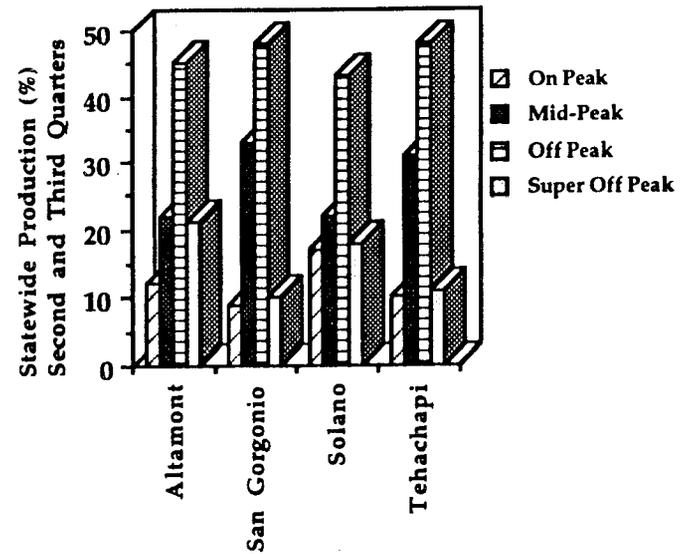


FIGURE 31: Resource Area Output During Time-of-Use Demand Periods

6. WPRS ANNUAL SUMMARY TABLES

Summary tables on the following pages include aggregate data for all wind projects submitting 1992 quarterly reports to the California Energy Commission as part of the WPRS program. The data, extracted from project operator quarterly reports compiled in Section 7, includes information about specific resource areas, turbine sizes, turbine types, turbine manufacturers, turbine operators, and turbine origins (domestic or foreign).

Note that some operators filed reports with missing data; therefore, totals for the various subcategories may not always equal statewide totals. Also note that kWh per square meter results include an asterisk if some portion of the cumulative turbine capacity being considered includes new turbines that did not operate for a full year. Unless the new turbine capacity represents a significant percentage of cumulative capacity, however, the negative impact on performance for most turbine groups will be minimal.

1992 WPRS DATA SUMMARY TABLE

Data Category	Cumulative Capacity (kW)	New Capacity (kW)	Output (kWh)	Actual / Projected Output (%)	Actual Capacity Factor (%)	kWh/ Square Meter	Cumulative Turbines	New Turbines
STATEWIDE								
1st Quarter	1,681,498	5,660	323,639,890	46	9	81 *	16,348	23
2nd Quarter	1,664,774	7,066	1,048,458,265	71	29	260 *	16,036	48
3rd Quarter	1,669,609	3,600	969,483,450	69	27	240 *	16,071	16
4th Quarter	1,655,110	500	408,060,438	71	11	102 *	15,856	1
1992 Totals	1,655,110	16,826	2,749,642,043	64	19	683	15,856	88
RESOURCE AREA								
Altamont								
1st Quarter	708,100	4,200	55,425,173	33	4	36 *	6,827	14
2nd Quarter	688,660	2,400	399,861,035	50	26	258 *	6,499	8
3rd Quarter	688,660	0	452,655,329	61	30	296	6,499	0
4th Quarter	683,176	0	93,770,095	45	6	65	6,451	0
1992 Totals	683,176	6,600	1,001,711,632	47	17	655	6,451	22
San Geronio								
1st Quarter	255,996	960	75,806,432	53	14	109 *	3,585	8
2nd Quarter	261,147	4,666	207,122,291	67	37	289 *	3,626	40
3rd Quarter	263,017	0	157,142,853	69	27	218	3,652	0
4th Quarter	263,452	500	70,294,184	86	12	97 *	3,646	1
1992 Totals	263,452	6,126	510,365,760	69	23	713	3,646	49
Tehachapi								
1st Quarter	641,397	500	188,535,012	55	14	120 *	5,169	1
2nd Quarter	638,962	0	391,813,560	84	28	250	5,144	0
3rd Quarter	641,927	3,600	303,420,940	74	22	193 *	5,153	16
4th Quarter	632,477	0	232,317,058	72	17	149	4,992	0
1992 Totals	632,477	4,100	1,116,086,570	71	20	712	4,992	17

1992 WPRS DATA SUMMARY TABLE

Data Category	Cumulative Capacity (kW)	New Capacity (kW)	Output (kWh)	Actual / Projected Output (%)	Actual Capacity Factor (%)	kWh/ Square Meter	Cumulative Turbines	New Turbines
RESOURCE AREA								
Pacheco								
1st Quarter	16,005	0	1,247,613	4	4	24	167	0
2nd Quarter	16,005	0	8,323,779	112	24	160	167	0
3rd Quarter	16,005	0	8,883,528	83	25	170	167	0
4th Quarter	16,005	0	2,131,901	97	6	41	167	0
1992 Totals	16,005	0	20,586,821	74	15	395	167	0
Solano								
1st Quarter	60,000	0	2,625,660	21	2	18	600	0
2nd Quarter	60,000	0	41,337,600	84	31	279	600	0
3rd Quarter	60,000	0	47,380,800	92	36	320	600	0
4th Quarter	60,000	0	9,547,200	76	7	64	600	0
1992 Totals	60,000	0	100,891,260	68	19	681	600	0

1992 WPRS DATA SUMMARY TABLE

Data Category	Cumulative Capacity (kW)	New Capacity (kW)	Output (kWh)	Actual / Projected Output (%)	Actual Capacity Factor (%)	kWh/ Square Meter	Cumulative Turbines	New Turbines
TURBINE SIZE								
1-50 kw								
1st Quarter	55,472	0	8,433,137	30	8	52	1,731	0
2nd Quarter	56,432	0	25,934,582	45	23	158	1,755	0
3rd Quarter	56,432	0	20,456,676	46	18	124	1,755	0
4th Quarter	53,032	0	10,480,616	48	9	64	1,670	0
1992 Totals	53,032	0	65,305,011	42	15	398	1,670	0
51-100 kw								
1st Quarter	922,755	0	128,447,267	48	6	58	10,730	0
2nd Quarter	898,005	0	528,315,904	83	27	244	10,346	0
3rd Quarter	899,240	0	524,533,176	72	27	243	10,365	0
4th Quarter	893,350	0	166,558,600	76	9	78	10,283	0
1992 Totals	893,350	0	1,347,854,947	70	17	623	10,283	0
101-150 kw								
1st Quarter	236,594	960	44,205,068	44	9	79 *	1,946	8
2nd Quarter	241,010	4,416	158,550,627	64	32	278 *	1,985	39
3rd Quarter	241,010	0	136,060,516	78	27	239	1,985	0
4th Quarter	235,526	0	59,778,782	82	12	105	1,937	0
1992 Totals	235,526	5,376	398,594,993	67	20	701	1,937	47
151-200 kw								
1st Quarter	66,280	0	22,552,703	41	16	149	373	0
2nd Quarter	66,280	0	41,185,833	54	28	272	373	0
3rd Quarter	66,280	0	37,160,986	45	26	246	373	0
4th Quarter	66,280	0	16,822,378	43	12	111	373	0
1992 Totals	66,280	0	117,721,900	46	21	778	373	0

1992 WPRS DATA SUMMARY TABLE

Data Category	Cumulative Capacity (kW)	New Capacity (kW)	Output (kWh)	Actual / Projected Output (%)	Actual Capacity Factor (%)	kWh/ Square Meter	Cumulative Turbines	New Turbines
TURBINE SIZE								
200+ kw								
1st Quarter	400,397	4,700	117,849,045	55	14	135 *	1,568	15
2nd Quarter	403,047	2,650	269,541,983	64	32	304 *	1,577	9
3rd Quarter	406,647	3,600	224,126,940	76	27	255 *	1,593	16
4th Quarter	406,922	500	147,799,893	71	17	165 *	1,593	1
1992 Totals	406,922	11,450	759,317,861	67	23	859	1,593	41
TURBINE AXIS								
Horizontal								
1st Quarter	1,586,698	5,660	307,531,367	47	9	81 *	15,836	23
2nd Quarter	1,569,974	7,066	993,835,287	72	30	262 *	15,524	48
3rd Quarter	1,574,809	3,600	917,367,837	69	27	243 *	15,559	16
4th Quarter	1,560,310	500	385,399,119	72	12	102 *	15,344	1
1992 Totals	1,560,310	16,826	2,604,133,610	65	20	688	15,344	88
Vertical								
1st Quarter	94,800	0	13,955,853	35	7	94	512	0
2nd Quarter	94,800	0	29,693,642	57	14	200	512	0
3rd Quarter	94,800	0	24,970,457	74	12	168	512	0
4th Quarter	94,800	0	16,041,150	58	8	108	512	0
1992 Totals	94,800	0	84,661,102	56	10	570	512	0

1992 WPRS DATA SUMMARY TABLE

Data Category	Cumulative Capacity (kW)	New Capacity (kW)	Output (kWh)	Actual / Projected Output (%)	Actual Capacity Factor (%)	kWh/ Square Meter	Cumulative Turbines	New Turbines
DOMESTIC TURBINES								
1st Quarter	786,785	4,200	77,529,824	34	5	46 *	8,482	14
2nd Quarter	787,265	2,400	424,363,300	57	25	101 *	8,466	8
3rd Quarter	787,265	0	446,365,594	62	27	265	8,466	0
4th Quarter	778,990	0	118,155,125	61	7	71	8,316	0
1992 Totals	778,990	6,600	1,066,413,843	54	16	483	8,316	22
FOREIGN TURBINES								
1st Quarter	894,713	1,460	243,957,396	52	13	106 *	7,866	9
2nd Quarter	877,509	4,666	599,165,629	77	32	266 *	7,570	40
3rd Quarter	882,344	3,600	495,972,700	73	26	222 *	7,605	16
4th Quarter	876,120	500	283,285,144	75	15	126 *	7,540	1
1992 Totals	876,120	10,226	1,622,380,869	69	22	720	7,540	66

1992 WPRS DATA SUMMARY TABLE

Data Category	Cumulative Capacity (kW)	New Capacity (kW)	Output (kWh)	Actual / Projected Output (%)	Actual Capacity Factor (%)	kWh/ Square Meter	Cumulative Turbines	New Turbines
TURBINE MANUFACTURER								
Aeroman (Germany)	11,320	0	16,453,968	----	17	473	283	0
Blue Max (USA)	4,000	0	2,252,838	39	6	290	80	0
Bonus (Denmark)	81,880	3,250	168,566,772	72	25	751 *	838	26
Bouma (Netherlands)	4,860	0	4,921,916	----	12	435	36	0
Carter (USA)	5,975	0	6,636,868	43	13	495	140	0
Century (CT) (USA)	4,400	0	1,381,545	----	4	268	44	0
Danwin (Denmark)	36,030	0	82,765,603	63	26	879	233	0
Delta (Unknown)	150	0	276,947	61	21	917	1	0
ESI (USA)	23,495	0	19,290,432	31	9	263	343	0
Enertech (USA)	18,280	0	26,145,923	48	16	412	451	0
Fayette (USA)	135,465	0	20,681,892	7	2	167	1,351	0
Floda (Austria)	1,500	0	2,038,882	48	16	668	3	0
FloWind (USA)	94,800	0	84,661,102	56	10	570	512	0
HMZ (Belgium)	37,300	0	30,590,109	2	11	513	174	0
Howden (Scotland)	28,290	0	45,184,581	54	18	695	91	0
Jacobs (USA)	11,705	0	11,894,499	36	13	408	630	0
MWT (Japan)	165,000	0	345,946,253	69	24	864	660	0
Micon (Denmark)	134,235	2,376	243,960,403	65	21	643 *	1,494	22
Nordtank (Denmark)	73,225	0	131,015,382	76	20	642	865	0
Oak (USA)	20,627	0	30,694,486	65	17	435	312	0
Polenko (Netherlands)	2,700	0	1,750,198	57	10	308	27	0
Storm Master (USA)	800	0	912,915	38	13	404	20	0
Sumitomo (Japan)	200	0	193,282	----	15	532	1	0
US Windpower (USA)	423,700	6,600	784,720,947	87	21	890 *	4,193	22
Vestas (Denmark)	277,670	4,600	526,169,648	79	22	707 *	2,593	18
WEG (England)	5,300	0	6,019,158	28	13	564	21	0
Wincon (USA)	21,368	0	30,921,576	68	17	505	200	0
Windane (Denmark)	14,000	0	46,218,820	124	38	1,454	35	0
Windmatic (Denmark)	16,460	0	16,527,767	88	12	301	220	0
Windtech (USA)	375	0	0	----	----	----	5	0

1992 WPRS DATA SUMMARY TABLE

Data Category	Cumulative Capacity (kW)	New Capacity (kW)	Output (kWh)	Actual / Projected Output (%)	Actual Capacity Factor (%)	kWh/ Square Meter	Cumulative Turbines	New Turbines
PROJECT OPERATOR								
AB Energy, Inc.	3,600	3,600	1,978,680	----	13	216 *	16	16
Altamont Energy Corporation	----	----	17,304,774	----	----	----	----	----
American Power Systems, Inc.	3,705	0	3,672,197	32	11	345	204	0
Arbutus	15,260	0	23,676,000	51	18	460	234	0
Arcadian Renewable Power Corporation	135,465	0	20,681,892	7	2	167	1,351	0
Calwind Resources, Inc.	8,710	0	12,472,000	74	16	463	134	0
Cannon Energy Corporation	68,948	0	120,091,174	----	20	688	716	0
Coram Energy Group	11,320	0	16,453,968	----	17	473	283	0
Difko Administration (US), Inc.	24,675	0	45,826,851	83	21	673	244	0
Energy Unlimited, Inc.	14,681	5,626	21,995,200	63	23	599 *	153	48
FDIC/Thompson Engineering	2,890	0	3,024,000	72	12	396	38	0
Flowind Corporation	139,440	0	178,976,524	60	15	695	862	0
Howden Wind Parks, Inc.	28,290	0	45,184,581	54	18	695	91	0
International Turbine Research	16,005	0	20,586,821	74	15	395	167	0
LFC Power Systems Corporation	----	----	41,769,757	----	----	----	----	----
Mogul Energy Corporation	4,000	0	2,252,838	39	6	73	80	0
Oak Creek Energy Systems	20,712	0	30,768,714	61	17	435	313	0
Renewable Energy Ventures	17,080	0	20,952,000	48	14	451	376	0
Riverview Ventures	4,360	0	1,646,657	28	5	186	218	0
San Gorgonio Farms	30,585	500	86,313,601	77	33	1,110 *	227	1
SeaWest Energy Group	306,872	0	601,965,260	58	22	748	2,321	0
Southern California Sunbelt	12,170	0	14,150,934	100	13	436	154	0
Tera Corporation	8,555	0	2,941,513	7	4	96	145	0
U.S. Windpower	429,150	6,600	791,145,005	76	21	747 *	4,215	22
Westwind Association	16,207	0	27,600,001	73	19	612	172	0
Windfarms Management	----	----	1,474,000	----	----	----	----	----
Windland, Inc.	16,500	0	27,821,601	57	19	709	134	0
WindMaster	37,300	0	30,590,109	2	11	513	174	0
Windridge	----	----	2,808,000	----	----	----	----	----
Windtricity Development Corporation	400	0	589,733	----	17	130	10	0
Windustries	----	----	893,600	----	----	----	----	----
Wintec, Ltd.	14,615	0	33,808,321	79	27	752	282	0
Zond Systems, Inc.	263,615	500	498,225,737	78	22	730 *	2,542	1

7. WPRS DATA

This section of the WPRS 1992 Annual Report contains performance data as submitted by wind project operators for four quarters. Wind data is organized by individual resource area with operators listed alphabetically within each resource area.

Project operators are numbered sequentially throughout the WPRS performance data section. For quick access to specific wind industry data, an alphabetical list of wind project operators and participants keyed to these sequential numbers follows.

Section Notes immediately precede performance report data. These notes describe how WPRS data is reported and calculated. Points of clarification and limitations of the data are also discussed.

Appendix A contains comments received from project operators during 1992. For easy reference, the project name and corresponding number in Section 7 has been noted. Appendix B contains a list of turbine manufacturers and distributors keyed to sequential numbers assigned to operators and participants. Appendix C provides sources of wind energy technical assistance available to California

project proponents. Appendix D lists sources of funding for renewable technology research and commercialization projects in California. Appendix E contains WPRS Regulations which provide definitions for most wind categories used in this report.

Data contained in the WPRS 1992 Annual Report represents project performance results for only a single year. As mentioned previously, data from any one year should not be used as the sole basis for evaluating overall wind project performance.

Alphabetical List of Wind Project Operators and Participants

The following alphabetical list includes all operators and other participants involved in California wind projects reporting 1992 performance data to the WPRS program. The number in parentheses following each operator and other participant refers to the sequential number location in this section.

AB Energy	(28A)	Phoenix Energy, Ltd.	(14A) (19C)
Alta Mesa	(19D)	Renewable Energy Ventures	(16A)
Altamont Energy Corp.	(1A)	Riverview Ventures	(17A-B)
Altech Energy Ltd.	(7A)	San Gorgonio Farms	(18A)
Altech Energy Ltd., II	(19A)	San Gorgonio Wind	(25C)
Altech Energy Ltd., III	(19B)	Seawest Energy Group	(7A-H)(19A-E) (36A-C)
Amer. Diversified Wind Partners	(3A)	Southern California Sunbelt	(20A) (37A)
American Power Systems	(13A)	TaxVest Wind Farms	(7D-E)
Arbutus	(29A)	TERA Corp.	(8A)
Arcadian (formerly Fayette)	(2A-H)	Toyo Power Corporation	(36B-C)
Cal. Wind Energy Systems,CWES	(7B)	U.S. Windpower	(9A-E) (21A) (27A)
Calwind Resources, Inc.	(30A-B)	Viking-Energy 83 Ltd.	(7F)
Cannon Energy Group	(31A-D)	Westwind Association	(22A)
CTV Marketing Group	(32C)	Western Windfarms	(7G)
Coram Energy Group	(32A-D)	Whitewater Ventures Inc.	(17B)
Difko Administration (US), Inc.	(4C-D) (14A-C)	Windfarms Management	(38A)
Energy Conversion Technology	(32A,D)	Windland, Inc.	(39A-B)
Energy Unlimited, Inc.	(15A)	WindMaster	(10A)
FDIC/Thompson Engineering	(3A)	Windridge, Inc.	(40A)
FloWind Corp.	(4A-D) (33A-B)	Windtricity Development Corp.	(23A)
Forsat, Inc.	(7F)	Windustries	(24A)
Grant Line Energy Corp.	(1A)	Wintec, Ltd.	(25A-D)
Howden Wind Parks, Inc.	(5A)	Zond Systems, Inc.	(11A) (26A-B) (41A-W)
International Turbine Research	(12A)		
LFC No. 51 Corporation	(6A)		
LFC Power Systems Corporation	(6A)		
Mogul Energy Corp.	(34A)		
Natural Resource Ventures	(30A)		
Oak Creek Energy Systems	(35A)		
PanAero Corp.	(26B)		

WIND DATA SECTION NOTES

The following notes explain methods used to report and calculate performance data. Definitions for most wind data categories used in this section are contained in WPRS regulations (*Appendix E*).

Data missing. Some operators submitted incomplete reporting forms. Items not completed are designated by a dash (----) to distinguish missing data from values of "0". It should be noted that operators who submit reports with missing data are in violation of WPRS regulations.

Failed to File. Commission staff identified wind project operators who did not submit performance data but according to utility reports should have participated in the WPRS program. Subsequently, Commission staff notified non-reporting operators by mail of the WPRS requirements. Non-reporting operators who were notified but did not respond or provide an explanation of why they should be exempted were noted as "failed to file."

Electricity Produced. Individual turbine model outputs submitted by wind operators are included for each quarter along with an annual total. An annual total for the entire project follows. Individual turbine model outputs may not always equal total project output because

individual turbine production is usually read from meters owned by project operators, while total project output is measured from utility substation meters. Line losses and calibration differences between meters should account for these differences.

The validation status of output data submitted by operators is noted in parentheses next to the quarterly output reported for each turbine model. The designation "V" indicates operator data has been validated either by a match to utility billings submitted by the operator or output reported to the Commission by the utility; "NV" indicates operator data has not been validated because it does not match utility billings submitted by the operator or output reported by the utility; and "UD" indicates output data has been derived solely from reports to the Commission by the utility in the absence of any reported data from the operator.

Other Participant(s). In some cases, participants in addition to the listed project operator may be involved in a project. These participants could include project managers, joint venture partners, wind developers using another developer's site, etc.

Projected Quarterly Production Per Turbine. The total quarterly projected production for a specific turbine model is determined by multiplying the "Projected Quarterly Production

Per Turbine" times the "Cumulative Number of Turbines" for that turbine model. The total quarterly projected production for an entire project is calculated by adding the projected production totals for all turbine models in a project. A comparison of total projected production with total project "Electricity Produced" can indicate how closely a specific project came to achieving projected output. When making this comparison, note that any new capacity would not benefit from a full operational quarter during the quarter it was installed.

Rotor (M²). The diameter of the rotor-swept area for each wind turbine allows different wind systems to be compared independently of wind resource area. Theoretically, the power available for any wind turbine is proportional to the square of the diameter of the rotor-swept area. Thus, doubling the size of the rotor diameter should increase the power output by a factor of four.

Size (kW). For each turbine model listed, the kW size rating is followed by a miles per hour (mph) specification. Because there is no standardized rating method, these mph specifications vary widely for different turbine models.

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification			Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2) (kW)			

ALTAMONT PASS (Alameda & Contra Costa)

1 ALTAMONT ENERGY CORP.

5625 Brisa St., Suite F
Livermore, CA 94550

A. Jess and Souza Ranches

Other Participant:
Grant Line Energy

FAILED TO FILE
FAILED TO FILE
FAILED TO FILE
FAILED TO FILE

1	1,282,670 (UD)
2	6,883,345 (UD)
3	7,403,070 (UD)
4	1,735,689 (UD)

PROJECT TOTAL 17,304,774

2 ARCADIAN RENEWABLE POWER CORP.

5990 Stoneridge Dr., Suite 119
Pleasanton, CA 94588

A. Castello Windranch

Operator Comment:
See Appendix E
Comment 1

Fayette 95IIS

(II) 95

95 kW@ 37 mph

1	7,000	0	8	8,891 (V)
2	-----			-----
3	-----			-----
4	-----			-----

Annual ----- 7,000 ----- 8,891

PROJECT TOTAL 8,891

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed		Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2) (kW)	Size		New	Cum.	

ALTAMONT PASS (Alameda & Contra Costa)

2 ARCADIAN RENEWABLE POWER CORP. (Cont'd)

	B. Fayette Wind Farms	Bonus 120/20	(H)	296	120 kW@ 34 mph	1	15,000	0	0	0 (V)
						2	138,000	0	0	0 (V)
Operator Comment: See Appendix E Comment 2						3	132,000	0	0	0 (V)
						4	15,000	0	0	0 (V)
					Annual		300,000		0	
		Fayette 400	(H)	374	400 kW@ 44 mph	1	30,000	0	2	0 (V)
						2	276,000	0	2	0 (V)
						3	264,000	0	2	0 (V)
						4	30,000	0	2	0 (V)
					Annual		600,000		0	
		Fayette 75IIS	(H)	85	75 kW@ 40 mph	1	6,000	0	132	17,278 (V)
						2	55,200	0	132	614,132 (V)
						3	52,800	0	132	678,719 (V)
						4	6,000	0	132	0 (V)
					Annual		120,000		1,310,129	
		Fayette 95IIS	(H)	95	95 kW@ 37 mph	1	7,000	0	1,073	565,187 (V)
						2	64,400	0	1,135	7,563,568 (V)
						3	61,600	0	1,135	10,456,711 (V)
						4	7,000	0	1,135	79,523 (V)
					Annual		140,000		18,664,989	

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Qtr.	Projected Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)	
		Model	Axis	Rotor Size (M2)	Size (kW)				New Cum.	(kWh)

ALTAMONT PASS (Alameda & Contra Costa)

2 ARCADIAN RENEWABLE POWER CORP. (Cont'd)

B. Fayette Wind Farms (Cont'd)	Micon 110/US	(H)	293	108 kW@	33 mph	1	15,000	0	0	0 (V)
						2	138,000	0	0	0 (V)
						3	132,000	0	0	0 (V)
						4	15,000	0	0	0 (V)
						Annual	300,000	-----	-----	0

PROJECT TOTAL **19,975,118**

Operator Comment:
See Appendix E
Comment 3

C. Rachel I Energy Corp.	Bonus 120/20	(H)	296	120 kW@	29 mph	1	15,000	0	14	0 (V)
						2	138,000	0	14	0 (V)
						3	132,000	0	14	0 (V)
						4	15,000	0	0	0 (V)
						Annual	300,000	-----	-----	0

	Micon 110/US	(H)	293	108 kW@	33 mph	1	15,000	0	8	0 (V)
						2	138,000	0	8	0 (V)
						3	132,000	0	8	0 (V)
						4	15,000	0	0	0 (V)
						Annual	300,000	-----	-----	0

PROJECT TOTAL **0**

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2)	Size (kW)			

ALTAMONT PASS (Alameda & Contra Costa)

2 ARCADIAN RENEWABLE POWER CORP. (Cont'd)

D. WETA I	Fayette 400	(H)	374	400 kW@	44 mph	1	30,000	0	7	0 (V)
						2	276,000	0	7	0 (V)
						3	264,000	0	7	0 (V)
						4	30,000	0	7	0 (V)
						Annual	600,000			0

PROJECT TOTAL 0

E. WETA II	Fayette 400	(H)	374	400 kW@	44 mph	1	30,000	0	23	0 (V)
						2	276,000	0	23	0 (V)
						3	264,000	0	23	0 (V)
						4	30,000	0	23	0 (V)
						Annual	600,000			0

	Fayette 95IIS	(H)	95	95 kW@	37 mph	1	7,000	0	33	4,575 (V)
						2	64,400	0	33	165,205 (V)
						3	61,600	0	33	262,502 (V)
						4	7,000	0	33	1,846 (V)
						Annual	140,000			434,128

PROJECT TOTAL 434,128

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification					Projected	Turbines	Electricity	
		Model	Axis	Rotor Size	Size		Qtr. Prod./Turbine	Installed	Produced	Produced
				(M2)	(kW)		(kWh)	New	Cum.	(kWh)

ALTAMONT PASS (Alameda & Contra Costa)

2 ARCADIAN RENEWABLE POWER CORP. (Cont'd)

Operator Comment: See Appendix E Comment 4	F. WETA III	Bonus 120/20	(H)	296	120 kW@	29 mph	1	15,000	0	11	0 (V)
							2	138,000	0	11	0 (V)
							3	132,000	0	11	0 (V)
							4	15,000	0	0	0 (V)
							Annual	----- 300,000			----- 0
		Fayette 95HS	(H)	95	95 kW@	37 mph	1	7,000	0	19	686 (V)
	2						64,400	0	19	115,642 (V)	
	3						61,600	0	19	119,458 (V)	
	4						7,000	0	19	0 (V)	
	Annual						----- 140,000			----- 235,786	
		Micon 110/US	(H)	293	108 kW@	33 mph	1	15,000	0	15	0 (V)
	2						138,000	0	15	0 (V)	
	3						132,000	0	15	0 (V)	
4	150,000						0	0	0 (V)		
Annual	----- 435,000								----- 0		
PROJECT TOTAL										----- 235,786	

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Qtr.	Projected Prod./Turbine (kWh)	Turbines Installed		Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2)	Size (kW)			New	Cum.	

ALTAMONT PASS (Alameda & Contra Costa)

2 ARCADIAN RENEWABLE POWER CORP. (Cont'd)

	G. Windranch Partners I	Fayette 95IIS	(H)	95	95 kW@ 37 mph	1	7,000	0	17	9,864 (V)
						2	-----	-----		-----
						3	-----	-----		-----
						4	-----	-----		-----
					Annual		7,000			9,864

PROJECT TOTAL 9,864

	H. Windranch Partners II	Fayette 95IIS	(H)	95	95 kW@ 37 mph	1	7,000	0	37	18,105 (V)
						2	-----	-----		-----
						3	-----	-----		-----
						4	-----	-----		-----
					Annual		7,000			18,105

PROJECT TOTAL 18,105

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2)	Size (kW)			

ALTAMONT PASS (Alameda & Contra Costa)

3 F.D.I.C./THOMPSON ENGINEERING
410 Ericwood Court
Manteca, CA 95336

Other Participant: American Diversified Wind Partners	A. Wind Farm I	Polenko	(H)	302	100 kW@	29 mph	1	7,900	0	12	34,500 (V)
							2	50,800	0	12	379,400 (V)
							3	53,600	0	12	448,300 (V)
							4	8,700	0	12	63,200 (V)
							Annual	----- 121,000			----- 925,400
		Windmatic	(H)	154	65 kW@	35 mph	1	6,090	0	26	77,500 (V)
2	31,125						0	26	924,600 (V)		
3	33,375						0	26	959,700 (V)		
4	6,840						0	26	136,800 (V)		
Annual	----- 77,430								----- 2,098,600		

PROJECT TOTAL 3,024,000

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed		Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2) (kW)	Size		New	Cum.	

ALTAMONT PASS (Alameda & Contra Costa)

4 FLOWIND CORPORATION
 900 A Street, Suite 300
 San Rafael, CA 94901

A. FloWind I (Dyer Road)	Flowind 17	(V)	260	143 kW@	44 mph	1	17,357	0	75	373,732 (V)
						2	68,169	0	75	3,049,173 (V)
						3	51,808	0	75	3,120,538 (V)
						4	15,447	0	75	634,397 (V)
						Annual	152,781			7,177,840
	Flowind 19	(V)	340	250 kW@	38 mph	1	30,717	0	1	10,238 (V)
						2	120,642	0	1	128,380 (V)
						3	91,688	0	1	140,099 (V)
						4	27,338	0	1	25,590 (V)
						Annual	270,385			304,307
PROJECT TOTAL										7,482,147

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2)	Size (kW)			

ALTAMONT PASS (Alameda & Contra Costa)

4 FLOWIND CORPORATION (Cont'd)

Operator Comment: See Appendix E Comment 5	B. FloWind II (Elworthy)	Danwin H19	(H)	284	110 kW@	30 mph	1	31,325	0	25	280,692 (V)
							2	108,504	0	25	1,489,447 (V)
							3	120,401	0	25	1,774,731 (V)
							4	32,207	0	25	517,235 (V)
							Annual	-----292,437			-----4,062,105
	Flowind F17	(V)	260	142 kW@	44 mph	1	23,957	0	73	503,430 (V)	
						2	107,527	0	73	4,042,108 (V)	
						3	113,070	0	73	4,754,393 (V)	
						4	24,432	0	73	829,011 (V)	
						Annual	-----268,986			-----10,128,942	
	Flowind F19	(V)	340	250 kW@	38 mph	1	39,619	0	19	161,077 (V)	
						2	187,009	0	19	1,710,225 (V)	
						3	190,559	0	19	2,148,821 (V)	
4						40,134	0	19	316,247 (V)		
Annual						-----457,321			-----4,336,370		
PROJECT TOTAL										-----18,527,417	

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected		Turbines Installed	Electricity Produced (kWh)		
		Model	Axis	Rotor Size (M2) (kW)	29 mph	Qtr. Prod./Turbine (kWh)	New Cum.				
<i>ALTAMONT PASS (Alameda & Contra Costa)</i>											
4 FLOWIND CORPORATION (Cont'd)											
	C. DifWind VII	Bonus Mark II	(H)	302	119 kW@	29 mph	1	37,854	0	200	3,203,979 (V)
							2	126,459	0	200	21,707,895 (V)
Other Participant:							3	138,986	0	200	25,270,137 (V)
Difko (US) Inc.							4	37,486	0	200	5,194,475 (V)
							Annual	340,785			55,376,486
							PROJECT TOTAL				55,376,486
	D. DifWind IX	Bonus Mark III	(H)	415	150 kW@	29 mph	1	54,224	0	100	2,423,378 (V)
							2	171,710	0	100	13,171,225 (V)
Other Participant:							3	176,229	0	100	15,433,478 (V)
Difko (US) Inc.							4	49,705	0	100	3,729,696 (V)
							Annual	451,868			34,757,777
		Bonus Mark II	(H)	302	119 kW@	29 mph	1	0	0	25	0 (V)
							2	0	0	25	0 (V)
							3	0	0	25	0 (V)
							4	0	0	25	0 (V)
							Annual	0			0
							PROJECT TOTAL				34,757,777

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification					Projected		Turbines		Electricity
		Model	Axis	Rotor Size (M2) (kW)	Size		Qtr. Prod./Turbine (kWh)	New	Cum.	Produced (kWh)	
<u>ALTAMONT PASS (Alameda & Contra Costa)</u>											
5 HOWDEN WIND PARKS, INC. 6400 Village Parkway Dublin, CA 94549											
	A. Howden Wind Park I	Howden 330/33	(H)	756	330 kW@	34 mph	1	7,242,000	0	82	2,899,251 (V)
							2	16,524,000	0	82	17,092,842 (V)
							3	19,941,000	0	82	19,852,170 (V)
							4	7,293,000	0	82	3,937,997 (V)
Operator Comment: See Appendix E Comment 6							Annual	51,000,000			43,782,260
		Howden 60/15	(H)	177	60 kW@	34 mph	1	14,796	0	8	245,664 (V)
							2	40,284	0	8	258,096 (V)
							3	30,845	0	8	253,344 (V)
							4	11,491	0	8	61,872 (V)
							Annual	97,416			818,976
		Howden 750/45	(H)	1,590	750 kW@	34 mph	1	161,660	0	1	35,808 (V)
							2	440,140	0	1	214,512 (V)
							3	421,260	0	1	230,650 (V)
							4	156,940	0	1	102,375 (V)
							Annual	1,180,000			583,345
PROJECT TOTAL											45,184,581

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed		Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2)	Size (kW)		New	Cum.	

ALTAMONT PASS (Alameda & Contra Costa)

7 SEAWEST ENERGY GROUP
1455 Frazee Road, Suite 300
San Diego, CA 92108

	A. Altech Energy, Ltd.	Enertech 44/40	(H)	140	40 kW@ 30 mph	1	9,700	0	144	210,457 (V)
Other Participant: Altech Energy, Ltd.						2	30,900	0	144	1,916,915 (V)
						3	30,300	0	144	2,341,331 (V)
						4	9,100	0	144	383,474 (V)
						Annual	80,000			4,852,177

PROJECT TOTAL 4,852,177

	B. C.W.E.S.	ESI 54	(H)	211	50 kW@ 30 mph	1	9,800	0	30	114,066 (V)
Other Participant: C.W.E.S.						2	31,300	0	30	788,778 (V)
						3	30,700	0	30	892,219 (V)
						4	9,200	0	30	177,501 (V)
						Annual	81,000			1,972,564

PROJECT TOTAL 1,972,564

	C. SeaWest Energy Group, Inc.	Micon 60/13	(H)	200	60 kW@ 30 mph	1	15,100	0	1	6,965 (V)
						2	47,800	0	1	47,365 (V)
						3	47,000	0	1	48,245 (V)
						4	14,100	0	1	9,583 (V)
						Annual	124,000			112,158

PROJECT TOTAL 112,158

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)
		Model	Axis	Rotor (M2)	Size (kW)			

ALTAMONT PASS (Alameda & Contra Costa)

7 SEAWEST ENERGY GROUP (Cont'd)

	D. TaxVest Windfarms, Inc. II	Micon 60/13	(H)	200	60 kW@ 30 mph	1	13,700	0	11	4,321 (V)
Other Participant: TaxVest Wind Farms						2	-----			----
						3	-----			----
						4	-----			----
						Annual	-----	13,700		-----
										4,321

PROJECT TOTAL 4,321

	E. TaxVest Windfarms, Inc.	Micon 60/13	(H)	200	60 kW@ 30 mph	1	13,700	0	95	563,194 (V)
Other Participant: TaxVest Wind Farms						2	-----			----
						3	-----			----
						4	-----			----
						Annual	-----	13,700		-----
										563,194

PROJECT TOTAL 563,194

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)			
		Model	Axis	Rotor Size (M2)	Size (kW)						
<i>ALTAMONT PASS (Alameda & Contra Costa)</i>											
7 SEAWEST ENERGY GROUP (Cont'd)											
Other Participant: Forsat, Inc.	F. Viking-Energy 83	Micon 60/13	(H)	200	60 kW@	30 mph	1	14,300	0	26	83,942 (V)
							2	45,500	0	26	624,751 (V)
							3	44,800	0	26	672,712 (V)
							4	13,400	0	26	130,970 (V)
							Annual				
PROJECT TOTAL									1,512,375		
Other Participant: Western Windfarms	G. SeaWest Energy Group, Inc.	Micon 60/13	(H)	200	60 kW@	30 mph	1	13,700	0	15	72,306 (V)
							2	43,600	0	15	448,129 (V)
							3	42,900	0	15	457,130 (V)
							4	12,800	0	15	97,562 (V)
							Annual				
PROJECT TOTAL									1,075,127		
Operator Comment: See Appendix E Comment 7	H. SeaWest Windfarms, Inc.	Micon 60/13	(H)	200	60 kW@	30 mph	1	13,700	0	72	183,389 (V)
							2	43,600	0	178	4,993,745 (V)
							3	42,900	0	178	6,363,079 (V)
							4	12,800	0	178	1,588,649 (V)
							Annual				
PROJECT TOTAL									13,128,862		

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)			
		Model	Axis	Rotor Size (M2) (kW)	Size						
<i>ALTAMONT PASS (Alameda & Contra Costa)</i>											
8 TERA CORPORATION 177 Bovet Rd., Suite 520 San Mateo, CA 94402											
Operator Comment: See Appendix E Comment 9	A. Delta Energy Project (Delta I-III)	ESI 54	(H)	211	50 kW@	30 mph	1	42,400	0	58	5,564 (NV)
							2	63,600	0	58	198,697 (NV)
							3	63,600	0	58	269,722 (NV)
							4	42,400	0	58	27,074 (NV)
							Annual	212,000			501,057
		ESI 54S	(H)	211	65 kW@	39 mph	1	46,400	0	87	35,230 (NV)
	2						69,600	0	87	950,336 (NV)	
	3						69,600	0	87	1,290,364 (NV)	
	4						46,400	0	87	164,526 (NV)	
	Annual						232,000			2,440,456	
PROJECT TOTAL										2,941,513	

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Qtr. Prod./Turbine (kWh)	Projected Turbines Installed New Cum.	Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2)	Size (kW)			

ALTAMONT PASS (Alameda & Contra Costa)

9 U.S. WINDPOWER
6952 Preston Ave.
Livermore, CA 94550

A. Dyer Road	USW 56-100	(H)	247	100 kW@	29 mph	1	21,000	0	460	5,059,599 (V)
						2	81,900	0	454	38,936,800 (V)
						3	86,000	0	454	42,408,800 (V)
						4	21,000	0	454	9,399,600 (V)
						Annual	----- 209,900			----- 95,804,799
PROJECT TOTAL									95,804,799	
B. Frick	USW 56-100	(H)	247	100 kW@	29 mph	1	21,000	0	100	1,261,920 (V)
						2	81,900	0	100	6,808,465 (V)
						3	86,100	0	100	6,729,729 (V)
						4	21,000	0	100	1,883,646 (V)
						Annual	----- 210,000			----- 16,683,760
PROJECT TOTAL									16,683,760	
C. Midway Road (Patterson Pass Road)	USW 56-100	(H)	247	100 kW@	29 mph	1	21,000	0	1,401	13,350,123 (V)
						2	81,900	0	1,401	104,686,867 (V)
						3	86,100	0	1,401	115,467,747 (V)
						4	21,000	0	1,401	25,436,966 (V)
						Annual	----- 210,000			----- 258,941,703

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2)	Size (kW)			

ALTAMONT PASS (Alameda & Contra Costa)

9 U.S.WINDPOWER (Cont'd)

C. Midway Road

(Patterson Pass Road)-(Cont'd)	WEG MS-2	(H)	491	250 kW@	33 mph		1	62,454	0	20	27,809 (V)
							2	256,065	0	20	2,270,000 (V)
							3	237,329	0	20	2,998,414 (V)
							4	68,700	0	20	518,633 (V)

Annual ----- 624,548 ----- 5,814,856

	WEG MS-3	(H)	855	300 kW@	26 mph		1	70,000	0	1	0 (V)
							2	301,000	0	1	5,000 (V)
							3	336,000	0	1	187,598 (V)
							4	84,000	0	1	11,704 (V)

Annual ----- 791,000 ----- 204,302

PROJECT TOTAL ----- **264,960,861**

D. Ralph

	USW 56-100	(H)	247	100 kW@	29 mph		1	21,000	0	809	11,178,736 (V)
							2	81,900	0	815	68,655,600 (V)
							3	86,100	0	815	80,379,628 (V)
							4	21,000	0	815	14,916,183 (V)

Annual ----- 210,000 ----- 175,130,147

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Qtr.	Projected Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)	
		Model	Axis	Rotor Size (M2)	Size (kW)					
<u>ALTAMONT PASS (Alameda & Contra Costa)</u>										
9 U.S.WINDPOWER (Cont'd)										
	D. Ralph (Cont'd)	USW 33M-VS	(H)	855	300 kW@ variable	1	0	2	2	72,264 (V)
						2	0	0	2	426,000 (V)
						3	0	0	2	341,972 (V)
						4	0	0	2	66,342 (V)
						Annual	0			906,578
										PROJECT TOTAL
										176,036,725
	E. Vasco Road	USW 56-100	(H)	247	100 kW@ 29 mph	1	21,000	0	727	4,702,678 (V)
						2	81,900	0	727	42,563,600 (V)
						3	86,100	0	727	49,397,114 (V)
						4	21,000	0	727	10,494,125 (V)
						Annual	210,000			107,157,517
										PROJECT TOTAL
										116,146,800

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)
		Model	Axis	Rotor (M2)	Size (kW)			

ALTAMONT PASS (Alameda & Contra Costa)

10 WINDMASTER
P.O. Box 669
Byron, CA 94514

	A. WindMaster	HMZ 200/83	(H)	373	200 kW@	33 mph		1	572,472	0	51	572,472 (V)
								2	5,528,835	0	51	4,539,640 (V)
								3	5,854,143	0	51	5,040,613 (V)
								4	1,374,463	0	51	980,055 (V)
								Annual	13,329,913			11,132,780
		HMZ 200/84	(H)	373	200 kW@	33 mph		1	725,017	0	58	725,017 (V)
								2	6,287,695	0	58	4,882,593 (V)
								3	6,567,653	0	58	4,658,703 (V)
								4	1,563,115	0	58	875,410 (V)
								Annual	15,143,480			11,141,723
		HMZ 200/85	(H)	373	200 kW@	33 mph		1	295,247	0	30	295,247 (V)
								2	3,252,256	0	30	2,417,621 (V)
								3	3,443,614	0	30	2,764,399 (V)
								4	808,508	0	30	498,500 (V)
								Annual	7,799,625			5,975,767

Operator Comment:
See Appendix E
Comment 10

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)	
		Model	Axis	Rotor Size (M2)	Size (kW)				
<u>ALTAMONT PASS (Alameda & Contra Costa)</u>									
10 WINDMASTER (Cont'd)									
	A. WindMaster (Cont'd)	HMZ 250	(H)	415	250 kW@ 33 mph	1	0	0 20	0 (V)
						2	2,813,966	0 20	61,781 (V)
						3	2,979,535	0 20	0 (V)
						4	699,549	0 20	255,784 (V)
					Annual		6,493,050		317,565
		HMZ 300	(H)	483	300 kW@ 33 mph	1	230,834	0 15	230,834 (V)
						2	2,532,569	0 15	1,774,668 (V)
						3	2,681,582	0 15	0 (V)
						4	629,594	0 15	16,772 (V)
					Annual		6,074,579		2,022,274
PROJECT TOTAL									30,590,109
11 ZOND SYSTEMS, INC. 13000 Jameson Rd. Tehachapi, CA 93581									
	A. 1985 Zond Windsystem Partners Series 85C	Vestas 17	(H)	227	90 kW@ 35 mph	1	24,745	0 200	1,961,213 (V)
						2	83,343	0 200	12,471,898 (V)
						3	98,488	0 200	13,812,417 (V)
						4	26,421	0 200	2,971,928 (V)
					Annual		232,997		31,217,456
PROJECT TOTAL									31,217,456

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected		Turbines		Electricity
		Model	Axis	Rotor	Size	Qtr. Prod./Turbine	Installed	New	Cum.	Produced
				(M2)	(kW)		(kWh)			(kWh)

PACHECO PASS (Merced County)

12 INTERNATIONAL TURBINE RESEARCH
 2300 Technology Parkway, Suite 2
 P.O. Box 96
 Hollister, CA 95023

A. ITR	Wincon W200	(H)	452	200 kW@	29 mph	1	157,541	0	4	80,425 (V)
						2	146,000	0	4	593,880 (V)
						3	198,000	0	4	653,528 (V)
						4	40,000	0	4	155,101 (V)
					Annual		541,541			1,482,934
	Wincon W99XT	(H)	346	100 kW@	27 mph	1	1,019,872	0	96	764,064 (V)
						2	44,000	0	96	4,557,502 (V)
						3	60,000	0	96	4,579,500 (V)
						4	12,500	0	96	1,123,500 (V)
					Annual		1,136,372			11,024,566
	Vestas 17E	(H)	283	100 kW@	33 mph	1	348,249	0	20	138,520 (V)
						2	68,000	0	20	1,290,724 (V)
						3	94,000	0	20	1,504,500 (V)
						4	19,000	0	20	367,500 (V)
					Annual		529,249			3,301,244

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification					Projected	Turbines	Electricity		
		Model	Axis	Rotor Size	(M2) (kW)		Qtr. Prod./Turbine (kWh)	Installed New Cum.	Produced (kWh)		
<i><u>PACHECO PASS (Merced County)</u></i>											
12 INTERNATIONAL TURBINE RESEARCH (Cont'd)											
	A. ITR	Vestas V17	(H)	277	90 kW@	33 mph	1	232,166	0	22	125,958 (V)
							2	27,000	0	22	831,413 (V)
							3	52,000	0	22	894,000 (V)
							4	9,000	0	22	189,000 (V)
						Annual		320,166			2,040,371
		Nordtank NKT65	(H)	216	65 kW@	32 mph	1	315,083	0	25	138,646 (V)
							2	36,000	0	25	1,050,260 (V)
							3	54,000	0	25	1,252,000 (V)
							4	11,500	0	25	296,800 (V)
						Annual		416,583			2,737,706
PROJECT TOTAL											20,586,821

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed		Electricity Produced (kWh)	
		Model	Axis	Rotor Size (M2)	Size (kW)		New	Cum.		
<u>SAN GORGONIO PASS (Riverside)</u>										
13 AMERICAN POWER SYSTEMS, INC. P.O. Box 2007 Rancho Mirage, CA 92270										
	A. WECS 33 Jacoby-Kerr Wind Park	Jacobs 26 17.5 @ 120'	(H)	49	18 kW@ 27 mph	1	10,346	0	16	42,013 (V)
						2	20,777	0	16	150,853 (V)
						3	16,416	0	16	127,694 (V)
						4	8,037	0	16	47,996 (V)
						Annual	55,576			368,556
		Jacobs 26 17.5 @ 80'	(H)	49	18 kW@ 27 mph	1	9,491	0	134	313,853 (V)
						2	19,836	0	134	943,710 (V)
						3	15,646	0	134	764,195 (V)
						4	7,182	0	134	318,438 (V)
						Annual	52,155			2,340,196
		Jacobs 29-20	(H)	61	20 kW@ 27 mph	1	12,277	0	54	134,946 (V)
						2	25,565	0	54	477,323 (V)
						3	19,323	0	54	246,690 (V)
						4	9,662	0	54	104,486 (V)
						Annual	66,827			963,445
PROJECT TOTAL										3,672,197

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed		Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2) (kW)			New	Cum.	

SAN GORGONIO PASS (Riverside)

14 DIFKO ADMINISTRATION (US), INC.
 19020 N. Indian Ave., Suite 2A
 P.O. Box 177
 No. Palm Springs, CA 92258

	A. Difwind Farms, Ltd.V Section 20	Micon 108	(H)	294	108 kW@ 30 mph		1	44,500	0	16	346,680 (V)
							2	120,500	0	16	1,851,260 (V)
							3	76,500	0	16	1,432,020 (V)
							4	33,800	0	16	560,400 (V)
							Annual	275,300			4,190,360

Other Participant:
 Phoenix Energy Ltd.

PROJECT TOTAL 4,190,360

	B. Difwind Partners	Micon 65	(H)	201	65 kW@ 30 mph		1	0	0	39	321,000 (V)
							2	0	0	39	1,677,500 (V)
							3	0	0	39	1,050,329 (V)
							4	0	0	39	355,362 (V)
							Annual	0			3,404,191

		Micon 108	(H)	294	108 kW@ 30 mph		1	0	0	116	2,131,500 (V)
							2	0	0	116	10,472,500 (V)
							3	0	0	116	7,163,666 (V)
							4	0	0	116	2,518,634 (V)
							Annual	0			22,286,300

PROJECT TOTAL 25,690,491

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Qtr.	Projected Prod./Turbine (kWh)	Turbines Installed		Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2)	Size (kW)			New	Cum.	

SAN GORGONIO PASS (Riverside)

14 DIFKO ADMINISTRATION (US), INC. (Cont'd)

	C. Difwind Farms Ltd.V Section 22	Micon 108	(H)	294	108 kW@ 30 mph						
						1	44,500	0	73	1,582,000 (V)	
						2	120,500	0	73	7,428,000 (V)	
						3	76,500	0	73	5,124,000 (V)	
						4	33,800	0	73	1,812,000 (V)	
						Annual	275,300			15,946,000	

PROJECT TOTAL **15,946,000**

15 ENERGY UNLIMITED, INC.

1 Aldwyn Center
Villanova, PA 19085

	A. Mountain Pass '85 Ltd.	Bonus 120	(H)	302	120 kW@ 40 mph						
						1	57,500	8	47	1,136,960 (V)	
						2	108,800	17	64	5,116,758 (V)	
						3	70,300	0	64	3,942,118 (V)	
						4	29,500	0	64	1,727,987 (V)	
						Annual	266,100			11,923,823	
		Bonus 65/13	(H)	181	65 kW@ 40 mph						
						1	20,500	0	65	819,970 (V)	
						2	72,000	0	65	2,997,289 (V)	
						3	43,000	0	65	1,855,326 (V)	
						4	24,500	0	65	833,572 (V)	
						Annual	160,000			6,506,157	

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)			
		Model	Axis	Rotor Size (M2) (kW)	Speed						
<u>SAN GORGONIO PASS (Riverside)</u>											
15 ENERGY UNLIMITED, INC. (Cont'd)											
A. Mountain Pass '85 Ltd. (Cont'd)	Delta 150	(H)	302	150 kW@	34 mph	1	86,400	0	1	7,070 (V)	
						2	201,000	0	1	88,360 (V)	
						3	127,500	0	1	130,110 (V)	
						4	58,300	0	1	51,407 (V)	
						Annual	473,200			276,947	
	Micon 108	(H)	284	108 kW@	32 mph	1					Installed second quarter
						2	148,100	22	22	1,208,494 (V)	
						3	95,600	0	22	1,106,295 (V)	
						4	40,100	0	22	579,792 (V)	
						Annual	283,800			2,894,581	
	Bonus 250	(H)	573	250 kW@	32 mph	1					Installed second quarter
						2	255,500	1	1	178,299 (V)	
						3	165,000	0	1	154,551 (V)	
4						69,100	0	1	60,842 (V)		
Annual						489,600			393,692		
PROJECT TOTAL									21,995,200		

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed		Electricity Produced (kWh)	
		Model	Axis	Rotor Size (M2) (kW)	New		Cum.			
<u>SAN GORGONIO PASS (Riverside)</u>										
16 RENEWABLE ENERGY VENTURES P.O. Box 742 North Palm Springs, CA 92258										
	A. REV Wind Power Partners	ESI 54-S	(H)	216	80 kW@ 40 mph	1	38,200	0	168	1,435,940 (V)
						2	81,100	0	168	6,066,306 (V)
						3	63,500	0	168	4,787,686 (V)
						4	28,300	0	168	2,086,423 (V)
						Annual	211,100			14,376,355
		Jacobs 26-17.5	(H)	49	18 kW@ 27 mph	1	9,500	0	208	666,460 (V)
						2	19,800	0	208	2,962,494 (V)
						3	15,600	0	208	2,052,314 (V)
						4	7,200	0	208	894,377 (V)
						Annual	52,100			6,575,645
PROJECT TOTAL										20,952,000

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed		Electricity Produced (kWh)		
		Model	Axis	Rotor Size (M2)	Size (kW)		New	Cum.			
<u>SAN GORGONIO PASS (Riverside)</u>											
17 RIVERVIEW VENTURES 19020 North Indian Avenue North Palm Springs, CA 92258											
Operator Comment: See Appendix E Comment 11	A. RVI Windpark	Jacobs 20	(H)	50	20 kW@	27 mph	1	8,634	0	177	331,200 (V)
							2	16,166	0	177	452,414 (V)
							3	12,394	0	177	634,558 (V)
							4	2,806	0	177	228,485 (V)
							Annual	----- 40,000		----- 1,646,657	
PROJECT TOTAL 1,646,657											
Other Participant: Whitewater Ventures, Inc.	B. WVI Windpark	Jacobs 20	(H)	50	20 kW@	27 mph	1	8,634	0	41	0 (V)
							2	16,166	0	41	0 (V)
							3	12,394	0	41	0 (V)
							4	2,806	0	41	0 (V)
							Annual	----- 40,000		----- 0	
PROJECT TOTAL 0											

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine	Turbines Installed	Electricity Produced			
		Model	Axis	Rotor Size (M2) (kW)	(kWh)				New Cum. (kWh)		
<u>SAN GORGONIO PASS (Riverside)</u>											
18 SAN GORGONIO FARMS 21515 Hawthorne Blvd., Suite 1059 Torrance, CA 90503											
	A. San Gorgonio Farms Wind Park	Bonus 100	(H)	294	100 kW@	28 mph	1	62,400	0	55	2,429,120 (V)
							2	146,520	0	55	6,837,683 (V)
							3	141,160	0	55	5,082,360 (V)
							4	49,920	0	55	2,423,560 (V)
							Annual	400,000			16,772,723
		Bonus 120	(H)	294	120 kW@	40 mph	1	68,640	0	1	56,614 (V)
							2	161,172	0	1	93,902 (V)
							3	155,276	0	1	102,064 (V)
							4	54,912	0	1	50,880 (V)
							Annual	440,000			303,460
		Bonus 450	(H)	961	450 kW@	30 mph	1	187,200	0	1	176,040 (V)
							2	439,560	0	1	511,400 (V)
							3	423,480	0	1	382,280 (V)
							4	149,760	0	1	158,480 (V)
							Annual	1,200,000			1,228,200
		Bonus 65	(H)	177	65 kW@	33 mph	1	43,680	0	81	1,791,613 (V)
							2	102,564	0	81	5,406,640 (V)
							3	98,812	0	81	3,576,167 (V)
							4	34,944	0	81	1,755,968 (V)
							Annual	280,000			12,530,388

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)		
		Model	Axis	Rotor Size (M2)	Size (kW)					
<u>SAN GORGONIO PASS (Riverside)</u>										
18 SAN GORGONIO FARMS (Cont'd)										
A. San Gorgonio Farms Wind Park (Cont'd)	Micon 65	(H)	177	65 kW@	33 mph	1	0	50	965,581 (V)	
						2	0	50	2,995,041 (V)	
						3	0	50	2,004,928 (V)	
						4	0	50	1,052,378 (V)	
						Annual	280,000		7,017,928	
	Windane 34	(H)	908	400 kW@	30 mph	1	0	35	7,337,300 (V)	
						2	0	35	17,992,801 (V)	
						3	0	35	14,156,919 (V)	
						4	0	35	6,731,800 (V)	
						Annual	1,100,000		46,218,820	
	Floda 500	(H)	1,018	500 kW@	31 mph	1	0	3	251,241 (V)	
						2	0	3	747,000 (V)	
						3	0	3	765,840 (V)	
						4	0	3	274,801 (V)	
						Annual	1,400,000		2,038,882	
	Vestas V39	(H)	1,195	500 kW@	36 mph	1	Installed fourth quarter			
						2				
						3				
						4	164,000	1	1	203,200
						Annual	164,000			203,200
PROJECT TOTAL								86,313,601		

Operator Comment:
See Appendix E
Comment 12

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)	
		Model	Axis	Rotor Size (M2)	Size (kW)				
<u>SAN GORGONIO PASS (Riverside)</u>									
19 SEAWEST ENERGY GROUP 1455 Frazee Rd., Suite 300 San Diego, CA 92108									
	A. Altech Energy Ltd. II	Enertech 44/40	(H)	141	40 kW@ 30 mph	1	24,300	0 85	642,000 (V)
						2	56,100	0 85	3,039,000 (V)
						3	38,200	0 85	2,142,000 (V)
						4	15,500	0 85	777,000 (V)
						Annual	134,100		6,600,000
							PROJECT TOTAL		6,600,000
	B. Altech Energy Ltd. III	Micon 100/US	(H)	283	108 kW@ 30 mph	1	53,500	0 268	4,400,286 (V)
						2	160,200	0 268	22,948,766 (V)
						3	108,900	0 268	15,769,244 (V)
						4	41,400	0 268	5,389,977 (V)
						Annual	364,000		48,508,273
		Micon 60	(H)	201	60 kW@ 30 mph	1	32,200	0 53	471,714 (V)
						2	79,900	0 53	2,587,234 (V)
						3	52,700	0 53	1,678,756 (V)
						4	22,200	0 53	610,023 (V)
						Annual	187,000		5,347,727
							PROJECT TOTAL		53,856,000

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2)	Size (kW)			
<u>SAN GORGONIO PASS (Riverside)</u>								
19 SEAWEST ENERGY GROUP (Cont'd)								
	E. SWWF II, Inc.	Enertech 44/40	(H)	141	40 kW@ 30 mph	1		
Operator Comment:						2	48,200	0 120 3,144,000 (V)
See Appendix E						3	38,200	0 120 3,306,000 (V)
Comment 13						4	17,700	0 120 1,691,900 (V)
						Annual	104,100	8,141,900
PROJECT TOTAL								8,141,900
20 SOUTHERN CALIFORNIA SUNBELT								
1100 Town & Country Rd. #700								
Orange, CA 92668								
	A. Palm Springs Wind Park (Edom Hill)	Windmatic 15S	(H)	189	65 kW@ 32 mph	1	9,700	0 83 791,626 (V)
Operator Comment:						2	31,113	0 82 2,551,248 (V)
See Appendix E						3	24,580	0 102 2,507,120 (V)
Comment 14						4	12,118	0 82 993,636 (V)
						Annual	77,511	6,843,630
		Windmatic 17S	(H)	227	95 kW@ 34 mph	1	10,916	0 4 43,664 (V)
						2	49,946	0 30 1,498,352 (V)
						3	24,469	0 36 880,880 (V)
						4	11,909	0 49 583,564 (V)
						Annual	97,240	3,006,460
PROJECT TOTAL								9,850,090

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Qtr.	Projected Prod./Turbine (kWh)	Turbines Installed		Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2)	Size (kW)			New	Cum.	
<u>SAN GORGONIO PASS (Riverside)</u>										
21 U.S. WINDPOWER 6952 Preston Ave. Livermore, CA 94550										
	A. Aldrich/BLM	USW 56-100	(H)	247	100 kW@ 29 mph	1	21,000	0	74	1,872,964 (V)
						2	81,900	0	74	8,603,600 (V)
						3	86,100	0	74	7,009,606 (V)
						4	21,000	0	74	2,729,730 (V)
						Annual	210,000			20,215,900
		Bonus	(H)	415	150 kW@ 34 mph	1	51,755	0	1	33,836 (V)
						2	169,380	0	1	184,000 (V)
						3	197,610	0	1	141,194 (V)
						4	51,755	0	1	45,870 (V)
						Annual	470,500			404,900
PROJECT TOTAL										20,620,800

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification					Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2)	Size (kW)				

SAN GORGONIO PASS (Riverside)

22 WESTWIND ASSOCIATION
P.O. Box 457
19020 North Indian Avenue
North Palm Springs, CA 92258

A. Westwind Association Windpark	Micon 108	(H)	293	108 kW@	33 mph		1	50,893	0	13	297,347 (V)
							2	112,031	0	13	876,121 (V)
							3	91,002	0	13	627,426 (V)
							4	7,450	0	13	304,650 (V)
							Annual	261,376			2,105,544
	Micon 65	(H)	200	65 kW@	33 mph		1	38,170	0	46	808,973 (V)
							2	84,023	0	46	2,324,238 (V)
							3	68,252	0	46	1,708,931 (V)
							4	19,555	0	46	763,002 (V)
							Annual	210,000			5,605,144
	Nordtank 65	(H)	201	65 kW@	34 mph		1	38,170	0	13	206,337 (V)
							2	84,023	0	13	612,117 (V)
							3	68,252	0	13	447,970 (V)
							4	19,555	0	13	208,813 (V)
							Annual	210,000			1,475,237

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2) (kW)	33 mph			

SAN GORGONIO PASS (Riverside)

22 WESTWIND ASSOCIATION (Cont'd)

A. Westwind Association Windpark (Cont'd)	Wincon 108	(H)	293	108 kW@	33 mph	1	47,940	0	16	406,472 (V)
						2	124,080	0	16	1,223,137 (V)
						3	64,860	0	16	904,134 (V)
						4	45,120	0	16	415,107 (V)
						Annual	282,000			2,948,850
	Wincon 110	(H)	295	110 kW @	33 mph	1	47,940	0	84	2,204,872 (V)
						2	124,080	0	84	6,340,387 (V)
						3	64,860	0	84	4,723,539 (V)
						4	45,120	0	84	2,196,428 (V)
						Annual	282,000			15,465,226

PROJECT TOTAL 27,600,001

23 WINDTRICITY DEVELOPMENT CORPORATION

44790 S. Grimmer Blvd. #205
Fremont, CA 94538

A. Alliance Wind Park	Storm Master 12	(H)	113	40 kW@	30 mph	1	0	0	10	15,784 (V)
						2	0	0	10	308,101 (V)
						3	0	0	10	220,132 (V)
						4	0	0	10	45,716 (V)
						Annual	0			589,733

Operator Comment:
See Appendix E
Comment 15

PROJECT TOTAL 589,733

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)		
		Model	Axis	Rotor Size (M2) (kW)	Size					
<u>SAN GORGONIO PASS (Riverside)</u>										
24 WINDUSTRIES, INC. P.O. Box 913 North Palm Springs, CA 92258										
Operator Comment: See Appendix E Comment 16	A. Windustries I	Enertech 44/40	(H)	141	40 kW @ 30 mph	1	23,500	0	96	893,600 (V)
						2	-----	-----	-----	-----
						3	-----	-----	-----	-----
						4	-----	-----	-----	-----
						Annual	-----	23,500	-----	893,600
		Enertech 44/60	(H)	141	60 kW @ 35 mph	1	28,900	0	48	0 (V)
						2	-----	-----	-----	-----
						3	-----	-----	-----	-----
						4	-----	-----	-----	-----
						Annual	-----	28,900	-----	0
PROJECT TOTAL									893,600	

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2) (kW)				

SAN GORGONIO PASS (Riverside)

25 WINTEC, LTD.
P.O. Box 457
N. Palm Springs, CA 92258

	A. Wintec Cahuilla Windpark	Nordtank 65	(H)	201	65 kW @ 34 mph	1	45,326	0	72	1,928,782 (V)
						2	84,871	0	72	4,205,567 (V)
						3	65,071	0	72	3,590,904 (V)
						4	14,732	0	72	1,501,744 (V)
						Annual	210,000			11,226,997

PROJECT TOTAL **11,226,997**

	B. Wintec I Windpark	Carter 25	(H)	75	25 kW @ 26 mph	1	17,267	0	90	858,268 (V)
						2	32,332	0	90	1,681,661 (V)
						3	24,789	0	90	1,369,851 (V)
						4	5,612	0	90	522,251 (V)
						Annual	80,000			4,432,031

Operator Comment:
See Appendix E
Comment 17

		Micon 60/13	(H)	200	60 kW @ 33 mph	1	45,326	0	23	534,332 (V)
						2	84,871	0	23	1,194,139 (V)
						3	65,071	0	23	958,149 (V)
						4	14,732	0	23	442,549 (V)
						Annual	210,000			3,129,169

PROJECT TOTAL **7,561,200**

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification			Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)			
		Model	Axis	Rotor Size (M2) (kW)						
<u>SAN GORGONIO PASS (Riverside)</u>										
25 WINTEC, LTD. (Cont'd)										
	C. Wintec II (Whitewater)	Nordtank 65/13	(H)	201	65 kW @ 35 mph	1	45,326	0	63	1,794,000 (V)
						2	84,871	0	63	3,829,857 (V)
Other Participant:						3	65,071	0	63	3,050,402 (V)
San Gorgonio Wind						4	14,732	0	63	1,343,515 (V)
Operator Comment:						Annual	210,000			10,017,774
See Appendix E										
Comment 18										
						PROJECT TOTAL				10,017,774
	D. Wintec Palm Windpark	Micon 65	(H)	200	65 kW @ 33 mph	1	45,326	0	30	690,412 (V)
						2	84,871	0	30	1,639,056 (V)
						3	65,071	0	30	1,539,546 (V)
						4	14,732	0	30	566,696 (V)
						Annual	210,000			4,435,710
		Nordtank 65	(H)	201	65 kW @ 34 mph	1	45,326	0	4	86,901 (V)
						2	84,871	0	4	214,629 (V)
						3	65,071	0	4	209,550 (V)
						4	14,732	0	4	55,560 (V)
						Annual	210,000			566,640
						PROJECT TOTAL				5,002,350

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification			Qtr.	Projected Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2) (kW)				
<u>SAN GORCONIO PASS (Riverside)</u>								
26 ZOND SYSTEMS, INC. 13000 Jameson Rd. Tehachapi, CA 93581								
	A. Painted Hills "B" & "C"	Vestas 15	(H)	184	65 kW @ 35 mph	1	39,153	0 61 1,067,153 (V)
						2	89,422	0 61 2,829,230 (V)
						3	56,985	0 61 2,273,262 (V)
						4	26,993	0 61 987,036 (V)
						Annual	212,553	7,156,681
		Vestas 17	(H)	227	90 kW @ 45 mph	1	46,106	0 170 3,916,140 (V)
						2	105,302	0 170 9,801,568 (V)
						3	67,105	0 170 7,865,616 (V)
						4	31,787	0 170 3,604,317 (V)
						Annual	250,300	25,187,641
						PROJECT TOTAL		32,344,322
	B. Zond-PanAero Windsystems	Vestas 15	(H)	184	65 kW @ 35 mph	1	47,287	0 460 10,759,728 (V)
						2	96,481	0 460 21,559,516 (V)
						3	66,310	0 460 17,879,817 (V)
						4	37,625	0 460 9,299,832 (V)
						Annual	247,703	59,498,893
						PROJECT TOTAL		59,498,893

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2)	Size (kW)			
<u>SOLANO (Solano)</u>								
27 U.S. WINDPOWER 6952 Preston Ave. Livermore, CA 94550								
	A. Russell	USW 56-100	(H)	247	100 kW@ 29 mph	1	0	2,625,660 (V)
						2	0	41,337,600 (V)
						3	0	47,380,800 (V)
						4	0	9,547,200 (V)
						Annual	-----	-----
							210,000	100,891,260
PROJECT TOTAL								100,891,260

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification			Projected Qtr. Prod./Turbine (kWh)	Turbines Installed		Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2) (kW)		New	Cum.	

TEHACHAPI PASS (Kern)

28 AB ENERGY, INC.
10 Mission Bay Dr.
Corona Del Mar, CA 92625

	A. AB Energy	Vestas V27	(H)	573	225 kW@ 35 mph	1	Installed third quarter			
						2				
						3	0	16	16	42,880 (V)
						4	0	0	16	1,935,800 (V)
						Annual	----- 0		----- 1,978,680	
							PROJECT TOTAL		1,978,680	

29 ARBUTUS
2691 Richter Ave., #114
Irvine, CA 92714

	A. Pajuela Peak Wind Park	Bonus 65	(H)	225	65 kW @ 45 mph	1	40,500	0	229	5,028,000 (V)
						2	60,750	0	229	7,812,000 (V)
						3	45,600	0	229	5,808,000 (V)
						4	55,650	0	229	5,028,000 (V)
						Annual	----- 202,500		----- 23,676,000	
		Windtech 75	(H)	250	75 kW @ 55 mph	1	0	0	5	0 (V)
						2	0	0	5	0 (V)
						3	0	0	5	0 (V)
						4	0	0	5	0 (V)
						Annual	----- 0		----- 0	
							PROJECT TOTAL		23,676,000	

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification			Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)			
		Model	Axis	Rotor Size (M2) (kW)						
<u>TEHACHAPI PASS (Kern)</u>										
30 CALWIND RESOURCES, INC. 2659 Townsgate Rd. #122 Westlake Village, CA 91361										
	A. Natural Resource Ventures (Wind Resource I)	Nordtank 65/13	(H)	201	65 kW @ 35 mph	1	24,500	0	20	249,551 (V)
						2	36,500	0	20	464,060 (V)
						3	21,200	0	20	336,203 (V)
						4	17,800	0	20	248,989 (V)
						Annual	100,000			1,298,803
							PROJECT TOTAL			1,298,803
	B. Calwind Resources Inc. (Wind Resource I)	Nordtank 65/13	(H)	201	65 kW @ 35 mph	1	28,440	0	114	2,182,449 (V)
						2	41,760	0	114	3,815,940 (V)
						3	28,320	0	114	2,875,797 (V)
						4	21,480	0	114	2,299,011 (V)
						Annual	120,000			11,173,197
							PROJECT TOTAL			11,173,197

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification			Projected Qtr. Prod./Turbine (kWh)	Turbines Installed		Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2) (kW)		New	Cum.	

TEHACHAPI PASS (Kern)

31 CANNON ENERGY CORPORATION

P.O. Box 1457
Tehachapi, CA 93581

Operator Comment:
See Appendix E
Comment 19

A. Cameron Ridge Windpark Phase 3, 4A, 4B	Bouma 200	(H)	314	135 kW @ 40 mph	1	0	0	36	787,920 (V)
					2	0	0	36	1,907,111 (V)
					3	0	0	36	1,219,960 (V)
					4	0	0	36	1,006,925 (V)
					Annual	0	0	144	4,921,916
	CT-9000	(H)	117	100 kW @ 37 mph	1	0	0	44	196,553 (V)
					2	0	0	44	736,005 (V)
					3	0	0	44	267,935 (V)
					4	0	0	44	181,052 (V)
					Annual	0	0	176	1,381,545
	Micon 108	(H)	284	108 kW @ 33 mph	1	0	0	3	176,332 (V)
					2	0	0	3	332,342 (V)
					3	0	0	3	278,644 (V)
4					0	0	3	208,060 (V)	
Annual					0	0	12	995,378	

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2)	Size (kW)			

TEHACHAPI PASS (Kern)

31 CANNON ENERGY CORPORATION (Cont'd)

A. Cameron Ridge Windpark Phase 3, 4A, 4B (Cont'd)	Nordtank 150	(H)	330	150 kW @	42 mph	1	0	0	102	4,844,398 (V)
						2	0	0	102	10,201,923 (V)
						3	0	0	102	7,513,729 (V)
						4	0	0	102	6,284,140 (V)
						Annual	0	0	408	28,844,190
	Nordtank 65/136	(H)	201	65 kW @	35 mph	1	0	0	50	888,529 (V)
						2	0	0	50	1,630,738 (V)
						3	0	0	50	1,130,830 (V)
						4	0	0	50	1,016,858 (V)
						Annual	0	0	200	4,666,955
	Nordtank 90/16.6	(H)	215	74 kW @	42 mph	1	0	0	340	7,907,466 (V)
						2	0	0	340	15,059,564 (V)
						3	0	0	340	10,850,987 (V)
						4	0	0	340	8,704,542 (V)
						Annual	0	0	1360	42,522,559
	Micon 250	(H)	452	250 kW@	33 mph	1	0	0	3	318,041 (V)
						2	0	0	3	557,407 (V)
						3	0	0	3	444,836 (V)
						4	0	0	3	314,039 (V)
						Annual	0	0	12	1,634,323

PROJECT TOTAL 84,966,866

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2)	Size (kW)			

TEHACHAPI PASS (Kern)

31 CANNON ENERGY CORPORATION (Cont'd)

	B. Cannon Phase I	Storm Master 12	(H)	113	40 kW@ 38 mph	1	0	0	85	0 (V)
						2	0	0	85	0 (V)
						3	0	0	85	0 (V)
						4	0	0	0	0 (V)
Operator Comment: See Appendix E Comment 20						Annual	-----	0	-----	0

PROJECT TOTAL 0

	C. Cannon Phase II 1983	CT 6000	(H)	117	75 kW@ 30 mph	1	0	0	60	0 (V)
						2	0	0	60	0 (V)
						3	0	0	60	0 (V)
						4	0	0	0	0 (V)
Operator Comment: See Appendix E Comment 21						Annual	-----	0	-----	0

PROJECT TOTAL 0

		Windtech 75	(H)	197	75 kW@ 35 mph	1	0	0	5	0 (V)
						2	0	0	5	0 (V)
						3	0	0	5	0 (V)
						4	0	0	0	0 (V)
						Annual	-----	0	-----	0

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification			Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2) (kW)			

TEHACHAPI PASS (Kern)

31 CANNON ENERGY CORPORATION (Cont'd)

	D. Cannon Phase V	Micon 108	(H)	284	108 kW @ 33 mph	1	0	0	138	5,922,516 (V)
						2	0	0	138	13,089,921 (V)
						3	0	0	138	9,300,162 (V)
						4	0	0	138	6,811,709 (V)
						Annual	0			35,124,308
PROJECT TOTAL										35,124,308

32 CORAM ENERGY GROUP
25500 Hawthorne Blvd., Suite 2120
Torrance, CA 90505

	A. Coram TaxVest Windfarms	Aeroman 12.5 Series II	(H)	123	40 kW @ 27 mph	1	0	0	100	970,438 (V)
						2	0	0	100	2,073,446 (V)
	Other Participant:					3	0	0	100	1,766,911 (V)
	Energy Conversion Technology, Inc.					4	0	0	100	1,311,565 (V)
						Annual	0			6,122,360
PROJECT TOTAL										6,122,360
	B. Coram TaxVest Windfarms	Aeroman 12.5 Series II	(H)	123	40 kW @ 27 mph	1	0	0	47	480,512 (V)
						2	0	0	47	920,156 (V)
	Other Participant:					3	0	0	47	687,718 (V)
	Coram Energy Group					4	0	0	47	562,437 (V)
						Annual	0			2,650,823
PROJECT TOTAL										2,650,823

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification			Qtr.	Projected Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2) (kW)				
<u>TEHACHAPI PASS (Kern)</u>								
32 CORAM ENERGY GROUP (Cont'd)								
	C. Coram TaxVest Windfarms	Aeroman 12.5 Series II	(H)	123	40 kW @ 27 mph	1	0 0 109	1,015,575 (V)
						2	0 0 109	1,959,066 (V)
						3	0 0 109	1,642,842 (V)
						4	0 0 109	1,340,770 (V)
Other Participant: CTV Marketing Group						Annual	----- 0	----- 5,958,253
						PROJECT TOTAL		5,958,253
	D. Coram Energy Group	Aeroman 12.5 Series I	(H)	123	40 kW @ 27 mph	1	0 0 27	300,365 (V)
						2	0 0 27	570,879 (V)
						3	0 0 27	489,735 (V)
						4	0 0 27	361,553 (V)
Other Participant: Energy Conversion Technology, Inc.						Annual	----- 0	----- 1,722,532
						PROJECT TOTAL		1,722,532

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification			Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2) (kW)			

TEHACHAPI PASS (Kern)

33 FLOWIND CORPORATION
900 A Street, Suite 300
Pleasanton, CA 94901

A. FloWind Cameron Ridge Operator Comment See Appendix E Comment 22	Flowind 17	(V)	260	142 kW @ 44 mph	1	59,841	0	161	4,713,161 (V)
					2	90,175	0	161	8,951,591 (V)
					3	46,249	0	161	6,255,628 (V)
					4	55,297	0	161	6,029,134 (V)
					Annual	251,562			25,949,514
	Flowind 19	(V)	340	250 kW @ 38 mph	1	115,641	0	122	5,255,560 (V)
					2	182,951	0	122	7,655,928 (V)
					3	90,982	0	122	5,494,095 (V)
					4	103,621	0	122	5,084,264 (V)
					Annual	493,195			23,489,847
	Flowind 25	(V)	515	381 kW @ 44 mph	1	0	0	2	0 (V)
					2	0	0	2	0 (V)
					3	0	0	2	0 (V)
4					0	0	2	0 (V)	
Annual					0			0	

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed		Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2)	Size (kW)		New	Cum.	

TEHACHAPI PASS (Kern)

33 FLOWIND CORPORATION (Cont'd)

A. FloWind Cameron Ridge (Cont'd)	Sumitomo H22	(H)	363	200 kW @ 30 mph	1	0	0	1	0 (V)
					2	0	0	1	17,353 (V)
					3	0	0	1	139,525 (V)
					4	0	0	1	36,404 (V)
					Annual	-----	0	-----	193,282

PROJECT TOTAL **49,632,643**

B. FloWind IV	Flowind 19	(V)	340	250 kW @ 38 mph	1	94,005	0	58	2,928,672 (V)
					2	165,917	0	58	4,125,816 (V)
					3	84,944	0	58	3,038,136 (V)
					4	84,562	0	58	3,107,430 (V)
					Annual	-----	429,428	-----	13,200,054

Operator Comment
See Appendix E
Comment 23

PROJECT TOTAL **13,200,054**

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed		Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2)	Size (kW)		New	Cum.	

TEHACHAPI PASS (Kern)

34 MOGUL ENERGY CORPORATION

5204 Lansdale
Bakersfield, CA 93306

	A. Liberty Wind Park	Blue Max	(H)	97	50 kW@ 35 mph	1	11,300	0	80	361,128 (V)
						2	32,800	0	80	1,050,014 (NV)
Operator Comment						3	21,124	0	80	475,864 (V)
See Appendix E						4	9,276	0	80	365,832 (V)
Comment 24						Annual	74,500			2,252,838

PROJECT TOTAL 2,252,838

35 OAK CREEK ENERGY SYSTEMS

P.O. Box 1670
14633 Willow Springs Rd.
Tehachapi, CA 93581

	A. Oak Creek Energy Systems	Flowind 17	(V)	260	85 kW @ 27 mph	1	32,006	0	1	9,983 (V)
						2	62,161	0	1	30,421 (V)
Operator Comment						3	38,587	0	1	18,747 (V)
See Appendix E						4	28,532	0	1	15,077 (V)
Comment 25						Annual	161,286			74,228

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed		Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2)	Size (kW)		New	Cum.	
<u>TEHACHAPI PASS (Kern)</u>									
35 OAK CREEK ENERGY SYSTEMS (Cont'd)									
A. Oak Creek Energy Systems (Cont'd)	Oak 5	(H)	80	22 kW @ 27 mph	1	12,110	0	1	2,526 (V)
					2	23,521	0	1	10,781 (V)
					3	14,600	0	1	4,242 (V)
					4	10,796	0	1	4,076 (V)
					Annual	61,027			21,625
	Oak 7A	(H)	184	55 kW @ 27 mph	1	20,089	0	79	696,741 (V)
					2	39,015	0	79	2,043,770 (V)
					3	24,219	0	79	1,394,063 (V)
					4	17,908	0	79	1,054,574 (V)
					Annual	101,231			5,189,148
	Oak 7B	(H)	199	55 kW @ 27 mph	1	21,410	0	132	1,421,239 (V)
					2	41,581	0	132	3,745,603 (V)
					3	25,812	0	132	2,809,092 (V)
					4	19,086	0	132	1,879,628 (V)
					Annual	107,889			9,855,562
	Oak 9	(H)	296	90 kW @ 27 mph	1	32,454	0	100	2,239,110 (V)
					2	63,032	0	100	5,939,024 (V)
3					39,127	0	100	4,434,571 (V)	
4					28,932	0	100	3,015,446 (V)	
Annual					163,545			15,628,151	
PROJECT TOTAL								30,768,714	

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed		Electricity Produced (kWh)
		Model	Axis	Rotor (M2)	Size (kW)		New	Cum.	

TEHACHAPI PASS (Kern)

36 SEAWEST ENERGY GROUP
1455 Frazee Road, Suite 300
San Diego, CA 92108

A. Difwind VI/Viking I/Viking II
ToyoWest

	Danwin 23/160	(H)	423	160 kW @ 34 mph	1	120,000	0	91	3,092,043 (V)
					2	204,000	0	91	9,594,666 (V)
					3	162,000	0	91	8,578,479 (V)
					4	114,000	0	91	5,515,240 (V)
					Annual	600,000			26,780,428
	Micon 110	(H)	300	108 kW @ 30 mph	1	70,700	0	251	5,748,604 (V)
					2	137,800	0	251	16,348,807 (V)
					3	85,700	0	251	14,356,643 (V)
					4	78,200	0	251	9,258,411 (V)
					Annual	372,400			45,712,465
	MWT-250	(H)	491	250 kW @ 21 mph	1	130,000	0	20	1,414,377 (V)
					2	240,500	0	20	3,249,357 (V)
					3	149,500	0	20	2,452,447 (V)
					4	130,000	0	20	1,602,113 (V)
					Annual	650,000			8,718,294

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed		Electricity Produced (kWh)	
		Model	Axis	Rotor Size (M2)	Size (kW)		New	Cum.		
<u>TEHACHAPI PASS (Kern)</u>										
36 SEAWEST ENERGY GROUP (Cont'd)										
	A. Difwind VI/Viking I/Viking II Toyo West (Cont'd)	Nordtank 150S	(H)	330	150 kW @ 35 mph	1	77,300	0	62	2,128,976 (V)
						2	150,400	0	62	5,529,169 (V)
						3	93,500	0	62	4,888,431 (V)
						4	85,400	0	62	3,005,266 (V)
						Annual	406,600			15,551,842
							PROJECT TOTAL			96,763,029
	B. Mojave 17/16/18	MWT-250	(H)	610	250 kW @ 29 mph	1	156,450	0	340	20,287,616 (V)
						2	260,750	0	340	52,862,940 (V)
						3	178,800	0	340	41,308,140 (V)
						4	149,000	0	340	26,086,248 (V)
						Annual	745,000			140,544,944
							PROJECT TOTAL			140,544,944
	C. Mojave 4/Mojave 3/Mojave 5	MWT-250	(H)	610	250 kW @ 29 mph	1	156,450	0	300	27,002,668 (V)
						2	260,750	0	300	71,460,547 (V)
						3	178,800	0	300	62,423,266 (V)
						4	149,000	0	300	35,796,534 (V)
						Annual	745,000			196,683,015
							PROJECT TOTAL			196,683,015

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification			Qtr.	Projected Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2) (kW)				
<u>TEHACHAPI PASS (Kern)</u>								
37	SOUTHERN CALIFORNIA SUNBELT 1100 Town & Country Rd. #700 Orange, CA 92668							
	A. Mojave Wind Park	Windmatic 175	(H)	227	95 kW @ 34 mph	1	15,225	0 66 1,004,844 (V)
						2	45,128	0 39 1,760,000 (V)
						3	33,212	0 33 1,096,000 (V)
						4	19,130	0 23 440,000 (V)
					Annual		----- 112,695	----- 4,300,844
PROJECT TOTAL							4,300,844	
38	WINDFARMS MANAGEMENT 2509 Thousand Oaks Blvd., Suite 197 Thousand Oaks, CA 91362							
	A. Cache Creek Wind Farm	FAILED TO FILE				1		220,000 (UD)
		FAILED TO FILE				2		462,000 (UD)
		FAILED TO FILE				3		544,000 (UD)
		FAILED TO FILE				4		248,000 (UD)
PROJECT TOTAL							1,474,000	

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected	Turbines	Electricity	
		Model	Axis	Rotor Size		Qtr. Prod./Turbine	Installed	Produced	Produced
				(M2) (kW)		(kWh)	New Cum.	(kWh)	

TEHACHAPI PASS (Kern)

39 WINDLAND, INC.
118 State Place, Suite 201
Escondido, CA 92029

A. Windland Wind Park (Boxcar I)	Bonus 120/20	(H)	296	120 kW @ 40 mph	1	78,000	0	11	494,313 (V)
					2	157,000	0	11	898,230 (V)
					3	78,500	0	11	728,232 (V)
					4	78,500	0	11	617,191 (V)
					Annual	392,000			2,737,966
	Carter 25	(H)	77	25 kW @ 30 mph	1	15,300	0	39	236,774 (V)
					2	30,700	0	39	454,566 (V)
					3	15,300	0	39	394,949 (V)
					4	15,300	0	39	283,989 (V)
					Annual	76,600			1,370,278
	Carter 250	(H)	332	250 kW @ 38 mph	1	120,000	0	11	185,516 (V)
					2	240,000	0	11	285,691 (V)
					3	120,000	0	11	264,595 (V)
					4	120,000	0	11	98,757 (V)
					Annual	600,000			834,559
	Storm Master 12	(H)	113	40 kW @ 42 mph	1	18,000	0	10	73,543 (V)
					2	36,000	0	10	95,025 (V)
3					18,000	0	10	85,542 (V)	
4					18,000	0	10	69,072 (V)	
Annual					90,000			323,182	

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification			Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2) (kW)			

TEHACHAPI PASS (Kern)

39 WINDLAND, INC. (Cont'd)

A. Windland Wind Park (Boxcar I) (Cont'd)	Bonus 65/13	(H)	181	65 kW @ 40 mph	1	37,200	0	4	69,606 (V)
					2	74,400	0	4	132,905 (V)
					3	37,200	0	4	83,221 (V)
					4	37,200	0	4	93,750 (V)
					Annual	----- 186,000			----- 379,482
	Vestas 27	(H)	573	225 kW@ 30 mph	1	157,500	0	12	1,116,249 (V)
					2	157,500	0	12	1,780,783 (V)
					3	157,500	0	12	1,382,660 (V)
					4	157,500	0	12	1,263,235 (V)
					Annual	----- 630,000			----- 5,542,927
PROJECT TOTAL								11,188,394	
B. Windland Wind Park (Boxcar II)	Vestas 27	(H)	573	225 kW@ 30 mph	1	157,500	0	15	1,375,073 (V)
					2	157,500	0	15	2,310,003 (V)
					3	157,500	0	15	1,790,022 (V)
					4	157,500	0	15	1,597,434 (V)
					Annual	----- 630,000			----- 7,072,532

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification			Qtr.	Projected Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)		
		Model	Axis	Rotor Size (M2) (kW)						
<u>TEHACHAPI PASS (Kern)</u>										
39 WINDLAND, INC. (Cont'd)										
	B. Windland Wind Park (Boxcar II) (Cont'd)	Enertech 44/60	(H)	180	60 kW @ 35 mph	1	0	0	12	113,610 (V)
						2	0	0	12	219,102 (V)
						3	0	0	12	182,469 (V)
						4	0	0	12	137,506 (V)
						Annual	-----		0	-----
		Vestas 25	(H)	491	200 kW @ 30 mph	1	125,000	0	20	1,845,315 (V)
						2	125,000	0	20	2,744,897 (V)
						3	125,000	0	20	2,325,510 (V)
						4	125,000	0	20	1,992,266 (V)
						Annual	-----		500,000	-----
PROJECT TOTAL									16,633,207	
40 WINDRIDGE										
406 East Tehachapi Blvd.										
Tehachapi, CA 93561										
	A. Willowind	FAILED TO FILE			1			650,000 (UD)		
		FAILED TO FILE			2			790,000 (UD)		
		FAILED TO FILE			3			816,000 (UD)		
		FAILED TO FILE			4			552,000 (UD)		
PROJECT TOTAL									2,808,000	

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed		Electricity Produced (kWh)	
		Model	Axis	Rotor Size (M2)			New	Cum.		
<u>TEHACHAPI PASS (Kern)</u>										
41 ZOND SYSTEMS, INC. 13000 Jameson Rd. Tehachapi, CA 93581										
	A. Project '82 Pool PO1, 1983 Pool PO2	Polenko	(H)	254	100 kW @ 35 mph	1	79,507	0	15	430,065 (V)
						2	0	0	15	394,733 (V)
						3	0	0	15	0 (V)
						4	0	0	15	0 (V)
						Annual	79,507			824,798
						PROJECT TOTAL				824,798
	B. Project '82 Pool VO1, 1983 Pool VO2	Vestas 15	(H)	184	65 kW @ 35 mph	1	51,983	0	66	676,367 (V)
						2	1,001	0	67	757,449 (V)
						3	2,726	0	66	14,976 (V)
						4	2,461	0	66	83,884 (V)
						Annual	58,171			1,532,676
						PROJECT TOTAL				1,532,676
	C. Project '82 Pool WO1, 1983 Pool WO2	Windmatic 14S	(H)	165	65 kW @ 35 mph	1	53,325	0	30	125,511 (V)
						2	0	0	30	149,564 (V)
						3	0	0	30	0 (V)
						4	0	0	30	0 (V)
						Annual	53,325			275,075
						PROJECT TOTAL				275,075

Operator Comment
See Appendix E
Comment 26

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected		Turbines Installed	Electricity Produced						
		Model	Axis	Rotor Size (M2)		(kW)	Qtr. Prod./Turbine (kWh)		New Cum.	(kWh)					
<u>TEHACHAPI PASS (Kern)</u>															
41 ZOND SYSTEMS, INC. (Cont'd)															
Operator Comment See Appendix E Comment 27	D. Project '83 Pool VO2, ZO1, ZO2, '84 Pool VO4	Vestas 15	(H)	184	65 kW @ 35 mph	1	58,532	0	95	1,335,650 (V)					
						2	87,516	0	96	2,622,159 (V)					
						3	46,285	0	96	1,610,806 (V)					
						4	41,791	0	96	1,585,184 (V)					
											Annual	234,124			7,153,799
											PROJECT TOTAL				7,153,799
Operator Comment See Appendix E Comment 28	E. Project '84 Pool VO4, '85 Pool VZ1	Vestas 15	(H)	184	65 kW @ 35 mph	1	49,488	0	97	1,588,478 (V)					
						2	73,993	0	97	2,918,321 (V)					
						3	39,134	0	97	1,768,320 (V)					
						4	35,333	0	97	1,613,206 (V)					
											Annual	197,948			7,888,325
											PROJECT TOTAL				7,888,325
Operator Comment See Appendix E Comment 29	F. Project '84 Pool VO4, VO5, '85 Pool VO7, '85 VZ1	Vestas 15	(H)	184	65 kW @ 35 mph	1	46,847	0	85	1,144,142 (V)					
						2	70,044	0	85	2,565,037 (V)					
						3	37,027	0	85	1,579,092 (V)					
						4	33,431	0	85	1,560,900 (V)					
											Annual	187,349			6,849,171
											PROJECT TOTAL				6,849,171

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification			Qtr.	Projected Prod./Turbine (kWh)	Turbines Installed		Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2) (kW)			New	Cum.	

TEHACHAPI PASS (Kern)

41 ZOND SYSTEMS, INC. (Cont'd)

	G. Project '84 Pool VO6	Vestas 17	(H)	227	90 kW @ 35 mph	1	61,249	0	4	95,961 (V)
						2	91,578	0	4	173,830 (V)
						3	48,434	0	4	114,264 (V)
						4	43,730	0	4	116,027 (V)
Operator Comment See Appendix E Comment 30						Annual	244,991			500,082

PROJECT TOTAL 500,082

	H. Project '84 Pool WO3 '84 Pool WO4	Windmatic 15S	(H)	184	65 kW @ 35 mph	1	30,796	0	9	0 (V)
						2	46,044	0	9	3,158 (V)
						3	24,352	0	9	0 (V)
						4	21,987	0	9	0 (V)
						Annual	123,179			3,158

PROJECT TOTAL 3,158

	I. Project '84 Pool WO4	Windmatic 15S	(H)	184	65 kW @ 35 mph	1	8,296	0	1	0 (V)
						2	12,403	0	1	0 (V)
						3	6,559	0	1	0 (V)
						4	5,922	0	1	0 (V)
						Annual	33,180			0

PROJECT TOTAL 0

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification			Qtr.	Projected Prod./Turbine (kWh)	Turbines Installed		Electricity Produced (kWh)	
		Model	Axis	Rotor Size (M2) (kW)			New	Cum.		
<u>TEHACHAPI PASS (Kern)</u>										
41 ZOND SYSTEMS, INC. (Cont'd)										
Operator Comment See Appendix E Comment 31	J. Project '85 Pool V13	Vestas 15	(H)	184	65 kW @ 35 mph	1	17,254	0	8	71,840 (V)
						2	27,632	0	8	202,428 (V)
						3	14,154	0	8	131,584 (V)
						4	14,410	0	8	120,207 (V)
						Annual	73,450			526,059
						PROJECT TOTAL				
	K. Project '85 Pool V14, V18, V20	Vestas 15	(H)	184	65 kW @ 35 mph	1	37,396	0	41	551,625 (V)
						2	57,925	0	41	1,129,857 (V)
						3	30,511	0	41	806,821 (V)
						4	27,490	0	41	709,401 (V)
						Annual	153,322			3,197,704
						PROJECT TOTAL				
	L. Project '85 Pool V19, V21, V26	Vestas 17	(H)	227	90 kW @ 35 mph	1	47,632	0	41	1,018,364 (V)
						2	73,781	0	41	1,972,833 (V)
						3	38,861	0	41	1,474,955 (V)
						4	35,899	0	41	1,318,127 (V)
						Annual	196,173			5,784,279
						PROJECT TOTAL				

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2)	Size (kW)			

TEHACHAPI PASS (Kern)

41 ZOND SYSTEMS, INC. (Cont'd)

	M. Project '85 Pool V22 '86 Pool V25, '87 Pool V26	Vestas 17	(H)	227	90 kW @ 35 mph	1	55,367	0	34	1,037,444 (V)
						2	82,782	0	34	1,877,296 (V)
						3	43,782	0	34	1,314,358 (V)
						4	39,530	0	34	1,136,235 (V)
Operator Comment See Appendix E Comment 32						Annual	221,461			5,365,333

PROJECT TOTAL 5,365,333

	N. Project '85 Windsystems Partners, "A" and "B"	Vestas 17/6043	(H)	227	90 kW @ 35 mph	1	56,024	0	165	3,309,822 (V)
						2	89,722	0	165	6,806,652 (V)
						3	45,957	0	165	4,701,060 (V)
						4	46,793	0	165	4,322,269 (V)
Operator Comment See Appendix E Comment 33						Annual	238,496			19,139,803

		Vestas 17/6044	(H)	227	90 kW @ 35 mph	1	56,024	0	235	5,510,558 (V)
						2	89,722	0	235	9,300,936 (V)
						3	45,957	0	235	6,033,639 (V)
						4	46,793	0	235	6,320,246 (V)

Annual 238,496 27,165,379

PROJECT TOTAL 46,305,182

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification			Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)			
		Model	Axis	Rotor Size (M2) (kW)						
<u>TEHACHAPI PASS (Kern)</u>										
41 ZOND SYSTEMS, INC. (Cont'd)										
	O. Project '86 Pool V23	Vestas 23	(H)	415	200 kW @ 35 mph	1	70,657	0	1	59,114 (V)
						2	105,644	0	1	83,183 (V)
						3	55,874	0	1	16,229 (V)
						4	50,447	0	1	25,402 (V)
						Annual	282,622			183,928
						PROJECT TOTAL		183,928		
	P. Project '87 Pool V26	Vestas 17E	(H)	260	90 kW @ 35 mph	1	49,626	0	1	38,643 (V)
						2	76,871	0	1	75,000 (V)
						3	40,488	0	1	58,958 (V)
						4	37,403	0	1	46,429 (V)
						Annual	204,388			219,030
						PROJECT TOTAL		219,030		
Operator Comment See Appendix E Comment 34	Q. Project Victory Garden Phase IV	Vestas 27/6102	(H)	572	225 kW @ 35 mph	1	110,564	0	31	3,392,047 (V)
						2	198,241	0	31	5,730,413 (V)
						3	131,433	0	31	4,041,322 (V)
						4	119,291	0	31	3,714,277 (V)
						Annual	559,529			16,878,059

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification					Projected Qtr. Prod./Turbine (kWh)	Turbines Installed		Electricity Produced (kWh)	
		Model	Axis	Rotor Size (M2) (kW)				New	Cum.		
<u>TEHACHAPI PASS (Kern)</u>											
41 ZOND SYSTEMS, INC. (Cont'd)											
	Q. Project Victory Garden Phase IV (Cont'd)	Vestas 27/6103	(H)	572	225 kW @	35 mph	1	104,834	0	31	2,604,281 (V)
2							187,967	0	31	4,051,909 (V)	
3							124,621	0	31	2,745,723 (V)	
4							113,109	0	31	3,072,184 (V)	
Annual							530,531			12,474,097	
		Vestas 27/6104	(H)	572	225 kW@	35 mph	1	112,410	0	31	2,998,342 (V)
2							201,551	0	31	5,173,695 (V)	
3							133,628	0	31	3,705,576 (V)	
4							121,283	0	31	3,327,497 (V)	
Annual							568,872			15,205,110	
		Vestas 27/6107	(H)	572	225 kW@	35 mph	1	111,851	0	5	496,425 (V)
2							200,549	0	5	914,929 (V)	
3							132,963	0	5	644,449 (V)	
4							120,680	0	5	587,059 (V)	
Annual							566,043			2,642,862	
PROJECT TOTAL										47,200,128	

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification			Qtr.	Projected Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2) (kW)				

TEHACHAPI PASS (Kern)

41 ZOND SYSTEMS, INC. (Cont'd)

Operator Comment See Appendix E Comment 35	R. Project Zond '87 Pool V26	Vestas 15	(H)	184	65 kW @ 35 mph	1	40,388	0	2	44,501 (V)
						2	72,414	0	2	80,107 (V)
						3	48,010	0	2	60,520 (V)
						4	43,575	0	2	50,217 (V)
						Annual	----- 204,387			----- 235,345

		Vestas 17	(H)	227	90 kW @ 35 mph	1	40,994	0	56	1,610,571 (V)
						2	73,500	0	56	3,122,284 (V)
						3	48,730	0	56	2,168,770 (V)
						4	44,228	0	56	1,765,281 (V)
						Annual	----- 207,452			----- 8,666,906

PROJECT TOTAL 8,902,251

Operator Comment See Appendix E Comment 36	S. Project Zond '87 (H&S 20) V27	Vestas 17	(H)	227	90 kW @ 35 mph	1	41,853	0	54	1,966,008 (V)
						2	75,042	0	54	3,613,105 (V)
						3	49,752	0	54	2,734,170 (V)
						4	45,156	0	54	2,169,170 (V)
						Annual	----- 211,803			----- 10,482,453

PROJECT TOTAL 10,482,453

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification			Model	Axis	Rotor Size (M2) (kW)	Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)
<u>TEHACHAPI PASS (Kern)</u>										
41 ZOND SYSTEMS, INC. (Cont'd)										
	T. Project Zond '87 Pool V26	Vestas 15	(H)	184	65 kW @ 35 mph	1	40,388	0	3	62,403 (V)
						2	72,414	0	3	139,304 (V)
Operator Comment						3	48,010	0	3	101,066 (V)
See Appendix E						4	43,575	0	3	72,672 (V)
Comment 37						Annual	204,387			375,445
		Vestas 17	(H)	227	90 kW @ 35 mph	1	40,388	0	47	1,801,921 (V)
						2	72,414	0	47	3,117,949 (V)
						3	48,010	0	47	2,254,613 (V)
						4	43,575	0	47	1,835,748 (V)
						Annual	204,387			9,010,231
		Vestas 17E	(H)	260	90 kW @ 35 mph	1	40,388	0	13	600,659 (V)
						2	72,414	0	13	952,996 (V)
						3	48,010	0	13	673,069 (V)
						4	43,575	0	13	622,492 (V)
						Annual	204,387			2,849,216
PROJECT TOTAL										12,234,892

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification			Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)
		Model	Axis	Rotor Size (M2) (kW)			

TEHACHAPI PASS (Kern)

41 ZOND SYSTEMS, INC. (Cont'd)

	U. Project Zond '87 Pool V26	Vestas 17	(H)	227	90 kW @ 35 mph	1	40,388	0	62	1,978,036 (V)
						2	72,414	0	62	3,466,811 (V)
						3	48,010	0	62	2,503,452 (V)
						4	43,575	0	62	2,181,667 (V)
Operator Comment See Appendix E Comment 38						Annual	204,387			10,129,966

PROJECT TOTAL 10,129,966

	V. Project Zond '84, Pool V04 1985 Pool V07	Vestas 15	(H)	184	65 kW@ 35 mph	1	44,785	0	45	800,148 (V)
						2	66,961	0	45	1,556,418 (V)
						3	35,414	0	45	1,196,417 (V)
						4	31,974	0	45	979,170 (V)
Operator Comment See Appendix E Comment 39						Annual	179,134			4,532,153

PROJECT TOTAL 4,532,153

1992 ANNUAL WIND PROJECT PERFORMANCE REPORTING DATA

Location/Operator	Project	Turbine Specification				Projected Qtr. Prod./Turbine (kWh)	Turbines Installed New Cum.	Electricity Produced (kWh)	
		Model	Axis	Rotor Size (M2) (kW)	Size				
<u>TEHACHAPI PASS (Kern)</u>									
41 ZOND SYSTEMS, INC. (Cont'd)									
	W. Sky River	Vestas 27/6067	(H)	573	225 kW@ 35 mph	1	130,675	0 93	12,004,373 (V)
						2	196,449	0 93	15,216,829 (V)
Operator Comment						3	141,100	0 93	11,089,990 (V)
See Appendix E						4	101,687	0 93	13,681,100 (V)
Comment 40						Annual	----- 569,911		----- 51,992,292
		Vestas 27/6066	(H)	573	225 kW@ 35 mph	1	137,327	0 87	9,208,782 (V)
						2	212,327	0 87	15,986,511 (V)
						3	152,505	0 87	12,279,367 (V)
						4	109,707	0 87	11,558,537 (V)
						Annual	----- 611,866		----- 49,033,197
		Vestas 27/6065	(H)	573	225 kW@ 35 mph	1	147,806	0 162	15,889,708 (V)
						2	230,506	0 162	31,564,390 (V)
						3	165,562	0 162	24,871,372 (V)
						4	119,482	0 161	20,613,903 (V)
						Annual	----- 663,356		----- 92,939,373
		Vestas 39	(H)	1,195	500 kW@ 35 mph	1	0	1 1	127,331 (V)
						2	502,878	0 1	413,927 (V)
						3	361,195	0 1	304,264 (V)
						4	260,302	0 1	264,240 (V)
						Annual	----- 1,124,375		----- 1,109,762
PROJECT TOTAL									195,074,624

APPENDIX A: OPERATOR COMMENTS

Comment Number	Operator/Project Number	Project Name	Comment(s)
1.-4.	Arcadian (2A-H)	All Projects	Fayette Energy Corporation changed its corporate name to Arcadian Renewable Power Corporation as of December 1991.
	(2B)	Fayette WindFarms	<p>Effective first quarter 1992, turbines belonging to Wind Energy Partners I, II, and III were transferred to Fayette Windfarms. A total of 23 model 95IIS and 118 model 75IIS turbines were transferred.</p> <p>Effective second quarter 1992, turbines belonging to Castello Windranch, Windranch Partners I and Windranch Partners II were transferred to Fayette WindFarms. A total of 62 model 95IIS turbines were transferred.</p>
	(2C) (2F)	Rachel I Energy Corp. WETA III	In fourth quarter 1992, Arcadian Renewable Power reported that all Micon and Bonus turbines have been removed and no longer will be reported.
5.	FloWind (4B, 4C, 4D)	FloWind II (Elworthy) Difwind VII Difwind IX	Turbines which were previously part of the FloWind II (Elworthy) project were reassigned first quarter 1992. Two hundred Bonus Mark II turbines are now part of Difwind VII. One hundred Bonus Mark III turbines and 25 Bonus Mark II turbines have been assigned to Difwind IX. Projected and actual production shown for Difwind VII includes production for 25 Bonus Mark IIs assigned to Difwind IX.

Comment Number	Operator/Project Number	Project Name	Comment(s)
6.	Howden Wind Parks (5A)	Howden Wind Park I	Wind park is in full operation.
7.-8.	SeaWest Energy	(7G) SeaWest Energy Group	In first quarter 1992, SeaWest Energy Group, Inc. took over four Micon 60/13 wind turbines formerly owned by Astroseal.
		(7H) SeaWest Windfarms, Inc.	SeaWest Windfarms, Inc. took over 72 wind turbines from TaxVest Windfarms, Inc. during first quarter 1992. They took over 106 Micon 60/13 turbines during second quarter; 95 turbines were previously operated by TaxVest Windfarms, Inc. and 11 by TaxVest Windfarms, Inc. II.
9.	Tera Corporation	(8A) Delta Energy Project I-III	Machine Vendor (ESI, Inc.) filed for protection under Chapter 11 in January 1986. Service being provided by Tera Power Corporation during first quarter 1986.
10.	WindMaster	(10A) WindMaster	Effective May 16, 1990 all WindMaster 250 kW turbines were placed under Viking Capital management and operated by SeaWest Altamont. Viking Capital has elected not to operate the turbines since the fourth quarter of 1990. Effective second quarter 1992, WindMaster Service Corp. replaced Viking Capital and has assumed operating control over all WindMaster 250kW turbines.

Comment Number	Operator/Project Number	Project Name	Comment(s)
11.	Riverview Ventures (17A)	RVI Windpark	Effective June 1, 1992, Riverview Ventures, Inc. (RVI) has made an agreement with Wintec, Ltd./San Gorgonio Wind Associates, IV (SGWAIV) to allow SGWAIV to sell their excess electrical energy production from the Wintec Whitewater Windpark through the RVI power purchase agreement with Southern California Edison Co. This is only a temporary arrangement.
12.	San Gorgonio Farms (18A)	San Gorgonio Farms Wind Park	In September 1992, a Vestas V-39 500 kW turbine was installed and operated in the start-up mode for approximately three weeks. The turbine was accepted for full time production in January 1993.
13.	SeaWest Energy (19E)	SWWF II, Inc.	In second quarter 1992, SeaWest took over Enertech turbines previously operated by Windustries, Inc.
14.	S. California Sunbelt (20A)	Palm Springs (Edom Hill)	Second quarter 1992 cumulative turbine total for Windmatic 17S reflects additional turbines reassigned from Mojave Wind Park project (Tehachapi). Adjusted third and fourth quarter cumulative totals for Windmatic 15S and 17S do not reflect new installs.
15.	Windtricity (23A)	Alliance Wind Park	The lower producing turbines were not placed back on line until the beginning of March 1992. One of the turbines is still off line.

Comment Number	Operator/Project Number	Project Name	Comment(s)
16.	Windustries (24A)	Windustries I	During second quarter, SeaWest (SWWF II, Inc.) took over Enertech turbines previously operated by Windustries.
17.-18.	Wintec (25B)	Wintec I Windpark	Ninety-five (95) Carter 25 kW turbines have been removed for retrofit.
	(25C)	Wintec II (Whitewater)	Effective June 1, 1992, Wintec, Ltd. (San Gorgonio Wind Associates, IV) made a temporary agreement with Riverview Ventures Inc. to sell the excess electrical energy production of the Wintec Whitewater Windpark through Riverview Ventures' power purchase agreement with Southern California Edison. From June 1, 1992 to July 1, 1992, Wintec delivered 330,095 kWh of electricity through Riverview Ventures' PPA (QFID #6035).
19.-21.	Cannon Energy (31A, D)	Cameron Ridge Phase 3, 4A, 4B Cannon Phase V	In third quarter 1992, Cannon revised data on the location of turbines within projects.
		(31B) Cannon Phase I	Cannon Energy Corp. reported in fourth quarter 1992 that turbines in Cannon Phase I were decommissioned during 1984.
		(31C) Cannon Phase II 1983	Cannon reported in fourth quarter 1992 that all model CT-6000s and all Windtec 75s in Cannon Phase II were decommissioned in 1985 and 1984 respectively.

Comment Number	Operator/Project Number	Project Name	Comment(s)																		
22.-23.	FloWind (33A)	Cameron Ridge	<p>Curtailed hours are included in the energy-produced figures as follows:</p> <table border="1"> <thead> <tr> <th></th> <th><u>17M</u></th> <th><u>19M</u></th> </tr> </thead> <tbody> <tr> <td>1st quarter</td> <td>1,723,456</td> <td>2,647,632</td> </tr> <tr> <td>2nd quarter</td> <td>880,704</td> <td>1,596,168</td> </tr> <tr> <td>3rd quarter</td> <td>652,736</td> <td>1,192,512</td> </tr> <tr> <td>4th quarter</td> <td><u>1,049,426</u></td> <td><u>1,496,376</u></td> </tr> <tr> <td></td> <td>4,306,322</td> <td>6,932,688</td> </tr> </tbody> </table> <p>FloWind 25 and Sumitomo H22 are test turbines which ran intermittently; no projections have been provided.</p>		<u>17M</u>	<u>19M</u>	1st quarter	1,723,456	2,647,632	2nd quarter	880,704	1,596,168	3rd quarter	652,736	1,192,512	4th quarter	<u>1,049,426</u>	<u>1,496,376</u>		4,306,322	6,932,688
	<u>17M</u>	<u>19M</u>																			
1st quarter	1,723,456	2,647,632																			
2nd quarter	880,704	1,596,168																			
3rd quarter	652,736	1,192,512																			
4th quarter	<u>1,049,426</u>	<u>1,496,376</u>																			
	4,306,322	6,932,688																			
	(33B)	Flowind IV	<p>Curtailed hours are included in the energy- produced figures for 19-M turbines as follows:</p> <table border="1"> <thead> <tr> <th></th> <th><u>19M</u></th> </tr> </thead> <tbody> <tr> <td>1st quarter</td> <td>2,196,672</td> </tr> <tr> <td>2nd quarter</td> <td>1,449,816</td> </tr> <tr> <td>3rd quarter</td> <td>1,130,136</td> </tr> <tr> <td>4th quarter</td> <td><u>1,235,430</u></td> </tr> <tr> <td></td> <td>6,012,054</td> </tr> </tbody> </table>		<u>19M</u>	1st quarter	2,196,672	2nd quarter	1,449,816	3rd quarter	1,130,136	4th quarter	<u>1,235,430</u>		6,012,054						
	<u>19M</u>																				
1st quarter	2,196,672																				
2nd quarter	1,449,816																				
3rd quarter	1,130,136																				
4th quarter	<u>1,235,430</u>																				
	6,012,054																				
24.	Mogul Energy (34A)	Liberty Wind Park	<p>During first quarter 1992, 47 of 80 Blue Max turbines were in operation. During second, third and fourth quarters, 50 of the 80 Blue Max turbines were in operation.</p>																		

Comment Number	Operator/Project Number	Project Name	Comment(s)
25.	Oak Creek Energy (35A)	Oak Creek	Oak Creek Energy Systems, Inc. is three years into the complete remanufacture of all horizontal axis turbines installed in the Oak Creek project. Oak Creek Energy is now the responsible manufacturer of these turbines. At the end of 1991, "Oak 4" turbines were scrapped. Second quarter production has been verified from corrected billing statements.
26.-40.	Zond Systems, Inc.	Project names as listed	The production reported for this contract and specified turbine models includes kilowatt-hours which would have been produced except that production was curtailed at the request of the purchasing utility and due to new facility construction requirements.
	(41B)	Project '82 Pool VO1 1983, Pool VO2	Curtailed production occurred in third quarter.
	(41D)	Project '83 Pool VO2, ZO1, ZO2, '84 Pool VO4	Curtailed production occurred in third quarter.
	(41E)	Project '84 Pool VO4, '85 Pool VZ1	Curtailed production occurred in third quarter.
	(41F)	Project '84 Pool VO4, VO5, '85 Pool VO7, '85 VZ1	Curtailed production occurred in third quarter.
	(41G)	Project '84 Pool VO6	Curtailed production occurred in third quarter.

Comment Number	Operator/Project Number	Project Name	Comment(s)
26.-40.	Zond Systems, Inc.	Project names as listed	The production reported for this contract and specified turbine models includes kilowatt-hours which would have been produced except that production was curtailed at the request of the purchasing utility and due to new facility construction requirements.
(41J)		Project '85 Pool V13	Curtailed production occurred in first quarter.
(41M)		Project '85 Pool V22 '86 Pool V25, '87 Pool V26	Curtailed production occurred in third quarter.
(41N)		Project '85 Windsystems Partners "A" & "B"	Curtailed production occurred in first quarter.
(41Q)		Project Victory Garden	Curtailed production occurred in first quarter.
(41R)		Project Zond '87 Pool V26	Curtailed production occurred in first quarter.
(41S)		Project Zond '87 (H&S 20) Pool V27	Curtailed production occurred in first quarter.
(41T)		Project Zond '87 Pool V26	Curtailed production occurred in first quarter.
(41U)		Project Zond '87 Pool V26	Curtailed production occurred in first quarter.

Comment Number	Operator/Project Number	Project Name	Comment(s)
26.-40.	Zond Systems, Inc.	Project names as listed	The production reported for this contract and specified turbine models includes kilowatt-hours which would have been produced except that production was curtailed at the request of the purchasing utility and due to new facility construction requirements.
	(41V)	Project '84 Pool VO4 '85 Pool VO7	Curtailed production occurred in third quarter.
	(41W)	Sky River	Curtailed production occurred in first quarter.

APPENDIX B: WIND TURBINE MANUFACTURERS/DISTRIBUTORS

TURBINE BRAND NAMES	COUNTRY OF ORIGIN	MANUFACTURER/DISTRIBUTOR	PROJECT(S) WHERE TURBINE IS INSTALLED
1. Aeroman	West Germany	American M.A.N. West Coast Office 303 Hegenberger Rd., Suite 402 Oakland, CA 94621	(32A-D)
2. Blue Max	U.S.	Hall Machinery 1401 Airport Drive Bakersfield, CA 93308 "No Longer Active"	(34A)
3. Bonus	Denmark	Bonus Wind Turbines, Inc. Danregn Vindkraft Fabriksvej 4 DK 7330, Brande Denmark Bonus California 1300 Dove St., Suite 200 Newport Beach, CA 92660	(2B-C,F) (4C-D) (15A) (18A) (21A) (29A) (39A)
4. Bouma	Holland	Bouma Wind Turbines P.O. Box 79483 Houston, TX 77024	(31A)
5. Carter	U.S.	Carter Wind Systems, Inc. Route 1, Box 405A Burkburnett, TX 76354	(25B) (39A)

TURBINE BRAND NAMES	COUNTRY OF ORIGIN	MANUFACTURER/DISTRIBUTOR	PROJECT(S) WHERE TURBINE IS INSTALLED
6. Century (CT)	U.S.	Century Design, Inc. 3635 Afton Road San Diego, CA 92123 "No Longer Active"	(31A,C)
7. Danwin	Denmark	Danwin A/S Industrivej 12 DK-3000, Helsingor Denmark	(4B) (19D) (36A)
8. Delta	Unknown	Delta Address Unknown "No Longer Active"	(15A)
9. Enertech	U.S.	Enertech Corporation P.O. Box 1085 Norwich, VT 05055 "No Longer Active"	(7A) (19A,C,E) (24A) (39B)
10. ESI	U.S.	Energy Sciences, Inc. 7791 Fitch Irvine, CA 92714 "No Longer Active"	(7B) (8A) (16A)
11. Fayette	U.S.	Fayette Energy Corporation "No Longer Active"	(2A-B, D-H)

For information, contact:
Arcadian Renewable Power Corporation
5990 Stoneridge Dr., Suite 119
Pleasanton, Ca 94588

TURBINE BRAND NAMES	COUNTRY OF ORIGIN	MANUFACTURER/DISTRIBUTOR	PROJECT(S) WHERE TURBINE IS INSTALLED
12. Floda	Austria	Villas Styria Grossfolz 1-A 8790 Eisenerz Austria Dr. Eckhart Pehr Villas Construction Gesellschaft m.b.h. PO Box 181 A-9500 Villach Austria	(18A)
13. FloWind	U.S.	FloWind Corporation 900 A Street, Suite 300 San Rafael, CA 94901	(4A-B) (33A-B) (35A)
14. HMZ	Belgium	HMZ Belgium N.V. Rellestraat 3 Industrie Zone 5 3800 Sint-Truiden Belgium	(10A)
15. Howden	Scotland	James Howden and Company Old Govan Rd. Renfrew Scotland UK PA48JX	(5A)
16. Jacobs	U.S.	Wind Turbine Industries Corporation 16801 Industrial Circle, S.E. Prior Lake, MN 55372 Earth Energy Systems, Inc. PO Box 742 North Palm Springs, CA 92258	(13A) (16A) (17A-B)

TURBINE BRAND NAMES	COUNTRY OF ORIGIN	MANUFACTURER/DISTRIBUTOR	PROJECT(S) WHERE TURBINE IS INSTALLED
17. Micon	Denmark	Micon Wind Turbines, Inc. 2352 Research Drive Livermore, CA 94556	(2B-C,F) (7C-H) (14A-C) (15A) (18A) (19B-C) (22A) (25B,D) (31A,D) (36A)
		Moerup Manufacturing Co. Micon A/S Milskovvej 8, Helstrup DK-8900 Randers Denmark	
18. MWT	Japan	Mitsubishi c/o SeaWest Industries, Inc. 1455 Frazee Road, Suite 300 San Diego, CA 92108	(36A-C)
19. Nordtank	Denmark	Nordtank Energy Group Nyballevvej 8 DK-8444 Balle Denmark	(6A) (12A) (22A) (25A,C,D) (30A,B) (31A) (36A)
20. Oak	U.S.	Oak Creek Energy Systems, Inc. P.O. Box 1670 Tehachapi, CA 93581	(35A)
21. Polenko	Netherlands	Holec Power Systems, Inc. P.O. Box 2227 Livermore, CA 94550	(3A) (41A)
		Holec Group Polenko/Windmatic PO Box 258-7550AG Hengelo Holland	

TURBINE BRAND NAMES	COUNTRY OF ORIGIN	MANUFACTURER/DISTRIBUTOR	PROJECT(S) WHERE TURBINE IS INSTALLED
22. Storm Master	U.S.	Wind Power Systems 9279 Cabot Drive San Diego, CA 92126 "No Longer Active"	(23A) (31B) (39A)
		Alaska Applied Sciences PO Box 020993 Juneau, AK 99802	
23. Sumitomo	Japan	Sumitomo Machinery Corporation 2143 E. "D" Street Ontario, CA 91764	(33A)
24. U.S. Windpower (USW)	U.S.	U.S. Windpower 6952 Preston Ave. Livermore, CA 94550	(9A-E) (21A) (27A)
25. Vestas	Denmark	Vestas Wind Systems A/S P.O. Box 42 Smed Hansens, Vej 27 DK 6940, Lem Denmark	(11A) (12A) (18A) (26A,B) (28A) (39A,B) (41B, D-G, J-W)
26. Wincon	U.S.	Wincon Energy Systems 3942 Valley Ave. Pleasanton, CA 94566	(12A) (22A)
		Wincon Energy Systems Hagenstrupvej 38 8860 Ulstrup Denmark	

TURBINE BRAND NAMES	COUNTRY OF ORIGIN	MANUFACTURER/DISTRIBUTOR	PROJECT(S) WHERE TURBINE IS INSTALLED
27. Windane	Denmark	Danish Wind Technology Marsk Stiysvey 4 DK 8800, Viborg Denmark	(18A)
		Vestas-Danish Wind Tech A/S Smed Hansens Vej 27 DK-6940 Lem Denmark	
28. Wind Energy Group (WEG)	England	Wind Energy Group, Ltd. 345 Ruislip Rd. Southall, Middlesex, UB1 2QX England	(9C)
29. Windmatic	Denmark	Windmatic 17900 Sky Park Circle Suite 106 Irvine, CA 92714	(3A) (20A) (37A) (41C,H,I)
		Windmatic Industrivej nord 15 Bir. 7400 herring Denmark	
		Holec Group Polenko/Windmatic PO Box 258-7550 AG Hengelo Holland	
30. Windtech	U.S.	Windtech Inc. P.O. Box 837 Glastonbury, CT 06033	(29A) (31C)

APPENDIX C: SOURCES OF WIND ENERGY TECHNICAL ASSISTANCE

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APPENDIX D: SOURCES OF RESEARCH AND COMMERCIALIZATION FUNDING

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Program Descriptions:

ETAP General and Local Jurisdiction Solicitations occur once per year, generally in October. ETAP is a hardware funding program with awards in three categories: Primary Research Contracts (Research Phase); Repayable Research Contracts (Development Phase); and Loans (Demonstration or Final Development Phases). ETAP awards require matching funds of 50 percent for Primary Research and Repayable Research Contracts and 20 percent for Loans.

The first solicitation for the TRD&D program is scheduled for November 1993. The goal of the TRD&D program is to accelerate market adoption of selected technologies in the state's best interest by directing RD&D support at critical path technical issues. Technologies are selected based on estimated market impact in California as well as on other criteria. TRD&D awards require matching funds of at least 50 percent of the cost of the RD&D work.

The Small Business Energy Loan Program (SBELP) finances demonstrations of alternative technologies for users (businesses that purchase or use alternative technology hardware to reduce energy costs) and demonstrators (original equipment manufacturers, distributors or system designers of energy-related technologies). SBELP offers secured loans at 5 percent APR interest with a five-year repayment period and project financing up to 100 percent. Loan applications are accepted on a continuous basis.

APPENDIX E: WPRS REGULATIONS

**REGULATIONS
CALIFORNIA ADMINISTRATIVE CODE
TITLE 20, CHAPTER 2, SUBCHAPTER 3, ARTICLE 4**

WIND PROJECT PERFORMANCE REPORTING SYSTEM

**Adopted
November 28, 1984**

1381 Title and Purpose

The purpose of this article is to specify performance reporting requirements for operators of specified wind energy projects and for entities which purchase electricity from the projects and to identify requirements for the Commission to publish the information.

Authority cited: Sections 25213 and 25218 (e), Public Resources Code Reference: Sections 25216.5 (d), 25601 (c), and 25605, Public Resources Code.

1382 Definitions

For the purposes of this article, the following definitions shall apply unless the Commission has clearly indicated otherwise in these regulations:

- (a) "Contingency Costs": the costs which may be paid by investors after the initial investment, but which are not paid out of project revenues. Contingency costs may include such costs as turbine repairs or annual insurance fees paid during the reporting year.
- (b) "Cumulative Number of Turbines Installed": the cumulative total number of turbines of a given model installed by the end of the reporting period.
- (c) "Electricity Produced (kWh)": the total kilowatt hours actually produced by all of the turbines of a particular turbine model contained within the wind project where the electricity is delivered to a wind power purchaser for sale during the reporting period.
- (d) "Name of Wind Project": the name used for the project in any prospectus, offering memorandum, or sales literature.
- (e) "Number of Turbines Installed During Reporting Period": the number of additional turbines installed during the calendar quarter of the reporting period.
- (f) "Project Cost": the total cost of the turbines installed during the reporting period. Project cost includes all debt and equity investment in the project (including nonrecourse notes) and should be comparable to the project cost shown in the offering memorandum, prospectus or sales literature published by the developer.
- (g) "Projected Annual Production Per Turbine (kWh)": the annual average kWh production, by model, predicted by the developer in its prospectus, offering memorandum, or sales literature. This figure may be revised annually prior to the first reporting quarter of each year and shall be based upon average site specific wind distributions and the wind turbine power curves.
- (h) "Projected Quarterly Production Per Turbines (kWh)": the quarterly breakdown of the Projected Annual Production Per Turbine.

- (i) "Rotor (M²)": The rotor swept area in square meters for each turbine model.
- (j) "Size (kW)": the turbine manufacturer's published kW rating at a specific miles per hour (mph) with wind speed shown in parentheses.
- (k) "Turbine Model": the common or manufacturer's name for the turbine if that is a commonly used term for the model of a specific rotor (M²) and size (kW).
- (l) "Wind Power Purchaser": any electricity utility or other entity which purchases electricity from a wind project, as defined in this section.
- (m) "Wind Project": one or more wind turbine generators installed in California with a combined rated capacity of 100 kW or more, the electricity from which is sold to another party.
- (n) "Wind Project Operator": any developer or operator who directly receives payments for electricity from the wind power purchaser.

Authority cited: Sections 25213 and 25218 (e), Public Resources Code Reference: Sections 25216.5 (d), 25601 (c), and 25605, Public Resources Code.

1383 Reporting Period

For the purpose of this article, and unless otherwise indicated, the reporting period shall be each calendar quarter, beginning with the first quarter following the effective date of this article. Quarterly reports filed pursuant to this article shall be submitted not later than the forty-fifth day following the close of each reporting period. Reports shall be deemed submitted as of the date of postmark, provided that the report is properly and legibly completed.

Authority cited: Sections 25213 and 25218 (e), Public Resources Code Reference: Sections 25216.5 (d), 25601 (c), and 25605, Public Resources Code.

1384 Requirements to File

The information required by this article shall be submitted to the Commission by wind project operators and wind power purchasers. Reports shall be made on forms prescribed by order of the Commission and according to instructions accompanying the forms. A copy of the wind project prospectus, offering memorandum, and other sales literature shall accompany the initial report. All reports must be verified by a responsible official of the firm filing the report. Requests for confidentiality may be filed pursuant to 20 Cal. Admin. Code section 2501 et. seq.

Authority cited: Sections 25213 and 25218 (e), Public Resources Code Reference: Sections 25216.5 (d), 25601 (c), and 25605, Public Resources Code.

1385 Information Requirements: Wind Project Operators

Each operator firm submitting information pursuant to the provisions of the article shall include the following:

- (1) Name of wind project
- (2) Name and address of operator
- (3) Name and phone number of contact person at operator's firm
- (4) Operator's name as shown on power purchase contract (if different than 2 above)
- (5) Name of wind power purchaser
- (6) Purchase contract number
- (7) Resource area and county
- (8) Dates of reporting period
- (9) Turbine model
- (10) Cumulative number of turbines installed
- (11) Number of turbines installed during reporting period
- (12) Rotor (M^2)
- (13) Size (kW) at stated wind speed
- (14) Project cost
- (15) Additional project contingency costs for which investors may be responsible
- (16) Projected quarterly production per turbine (kWh)
- (17) Projected annual production per turbine (kWh)
- (18) Electricity produced (kWh)
- (19) Turbine manufacturer's name and address
- (20) Operator comments, if any

Authority cited: Sections 25213 and 25218 (e), Public Resources Code Reference: Sections 25216.5 (d), 25601 (c), and 25605, Public Resources Code.

1386 Information Requirement: Wind Power Purchase

Each wind power purchaser submitting information pursuant to the provisions of this article shall include the following:

- (1) Name of purchaser's firm
- (2) Name and phone number of contact person at purchaser's firm
- (3) Date of report
- (4) Name of wind project operator
- (5) Number of contract with wind project operator
- (6) kWh's produced during reporting period
- (7) Dates of reporting period
- (8) The maximum MW's which the operator can deliver to the purchaser as specified in the power sales agreement
- (9) Purchaser comments, if any

Authority cited: Sections 25213 and 25218 (e), Public Resources Code Reference: Sections 25216.5 (d), 25601 (c), and 25605, Public Resources Code.

1387 Publication of Data

The Commission staff shall compile and distribute, on a quarterly basis, the information reported by wind project operators and purchasers. Cost data will be published by the Commission in an aggregated form to the extent necessary to assure confidentiality. The final publication of each year shall combine the performance data for that year. The publication shall designate the name of any wind project operator from whom performance data is not

received.

Authority cited: Sections 25213 and 25218 (e), Public Resources Code Reference: Sections 25216.5 (d), 25601 (c), and 25605, Public Resources Code.

1388 Failure to Provide Information

The Commission may, after notifying any person of the failure to provide information pursuant to this article, take such action to secure the information as is authorized by any provision of law, including, but not limited to, Public Resources Code section 25900.

Authority cited: Sections 25213 and 25218 (e), Public Resources Code Reference: Sections 25216.5 (d), 25601 (c), and 25605 (e), and 25900, Public Resources Code.

1389 Exemptions

Operators of wind projects of less than 100 kW rated capacity or operators who do not offer electricity for sale are exempt from this article.

Authority cited: Sections 25213 and 25218 (e), Public Resources Code Reference: Sections 25216.5 (d), 25601 (c), and 25605, Public Resources Code.