

# You CAN run a project for 30+ years with 97%+ availability!

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## 1. ArcVera's Availability Database Insights

The average wind farm time availability is 96.0% and energy availability is 95.7%. This difference is significantly lower than the standard deviation of either database and is considered not statistically significant. Thus, ArcVera concludes that energy and time availability are comparable. Availability statistics per OEM, size, USA region and years of operation are provided. For a sample of the projects ranging between 10 and 20 years of operation, ArcVera found that the rate of decline in availability is 0.1%/year. Separating projects by the sample average results in two groups (good vs bad actors), the bias between them is 7%. Three projects have over 30 years of operation and present an average time availability of 97.6% for the years above 30.

## 2. Availability Database Description

ArcVera has a comprehensive availability database covering 256 projects spanning 1433 project years. A breakdown of the database by OEM, project size, USA region and years of operation is presented in Figure 1.

## 3. Availability Statistics

ArcVera chose only to include projects with a COD of 2006 or later to reflect recent project practices in Figure 2. Section 4 contains an analysis considering longer-running projects. The first year of operation data was left out of the analysis to avoid startup issues that cause lower availability in the first year. The average wind farm's time availability is 96.0% and energy availability is 95.7%. This difference is significantly lower than the standard deviation of either database and is considered not statistically significant. Most OEMs are close to average, except for OEM 10. Only OEMs with more than 5 projects were considered. No clear trend is evident between project size and availability. Midwest and West projects present higher availability than Northwest and South. Availability is highest in fall and spring, and dips in both summer and winter.

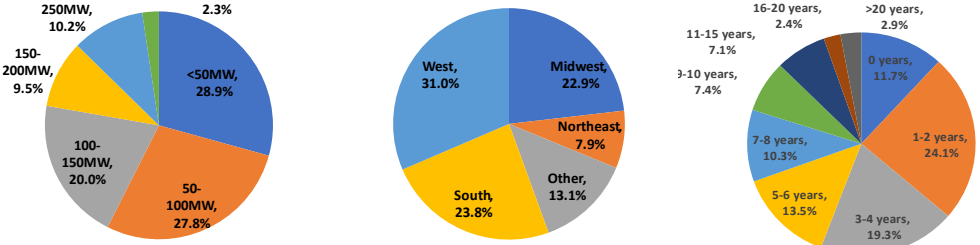


Figure 1: Arcvera's database statistics by OEM, Project Size, USA Region ("Other" assigned to projects outside USA), and Years of Operation, from left to right



Figure 2: Time vs Energy, Availability by size, OEM, season, region and year of operation (only projects with pre-2006 COD)

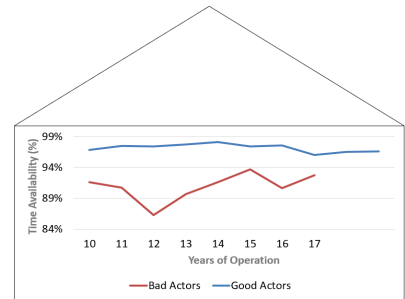


Figure 3: Good vs Bad actor availability analysis for Projects with 10-20 Years of operation

## 4. Availability of projects with 10+ years of operation

Figure 3 shows that operating at high availability levels within 10-20 years of operation is possible, with an average of 97.7%. However, bad actors underperform these projects by 7%. A linear availability model per years of operation indicates a rate of decline in the availability of 0.1%/year. Projects with 20+ years of operation presented 96.9% availability values. In the subset of projects with 30+ years of operation, the availability is 97.6%, showing that operating with high availability values is possible.

## 5. Final Remarks

ArcVera will keep actively monitoring the market availability data. Based on its current dataset, the industry will soon have many projects within 10-20 years of operation. It was shown that long-running projects can operate above the average of 96% availability. In fact, for years 10-20, the projects presented 97.7% availability values, and for 20+ and 30+ years of operation, the values were 96.9% and 97.6%, respectively.

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