

## 23.5MW Ellershouse Wind Farm Operations Report for F19-20

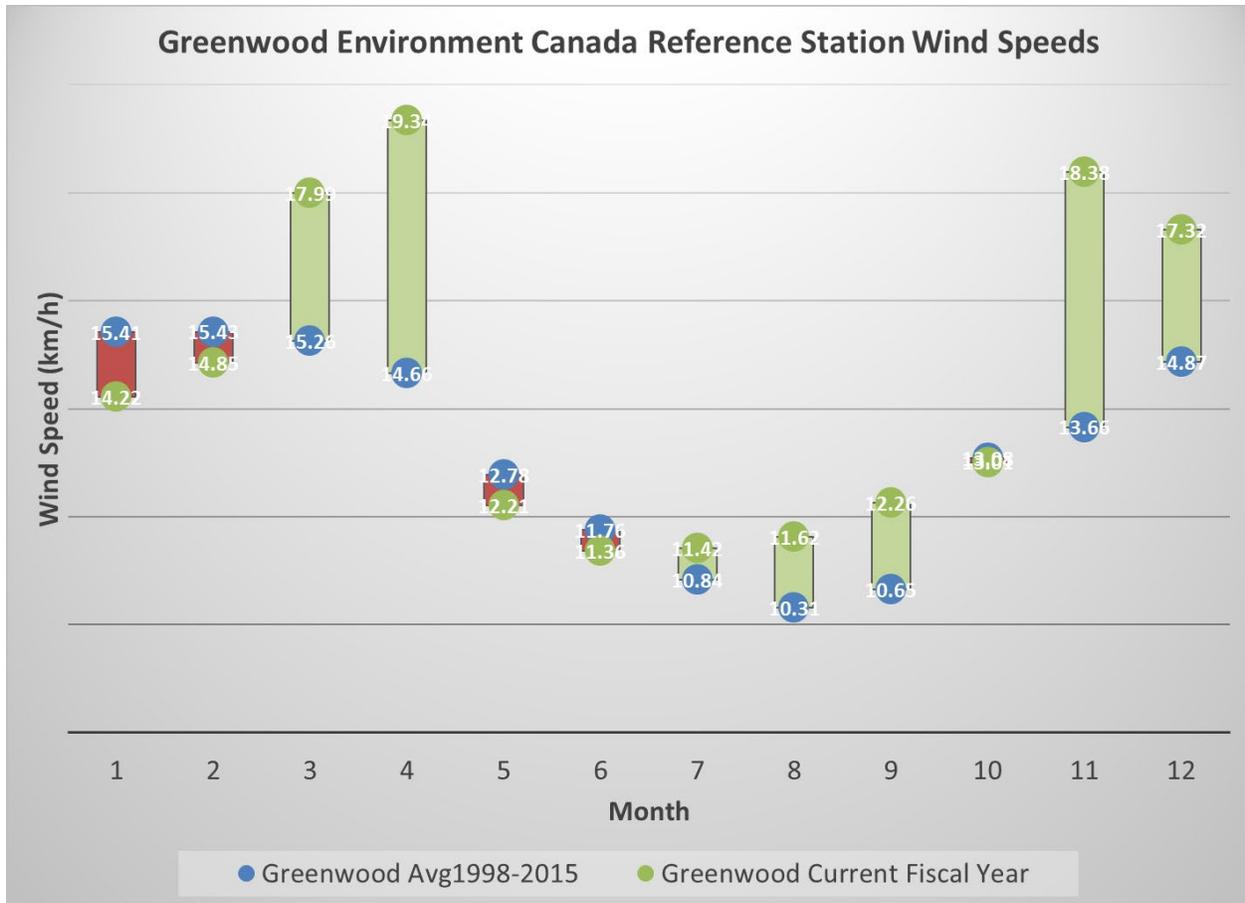
### NSPI's Revenue-Class Meter

Fiscal '19-'20

Actual 66753 MWh

Budgeted 64416 MWh **+3.5%**

### Wind resource



Fiscal 2019-20: +9.5% windier at Greenwood than long-term average

- Wind variance is usually higher than energy production variance.
- Wind has been higher than historical average since 2013. Ellershouse will continue to outperform investment case assumptions if the wind regime has permanently increased.



## Wind Resource

Figure 1 depicts how each turbine's production over the past two fiscal years compares to the average.

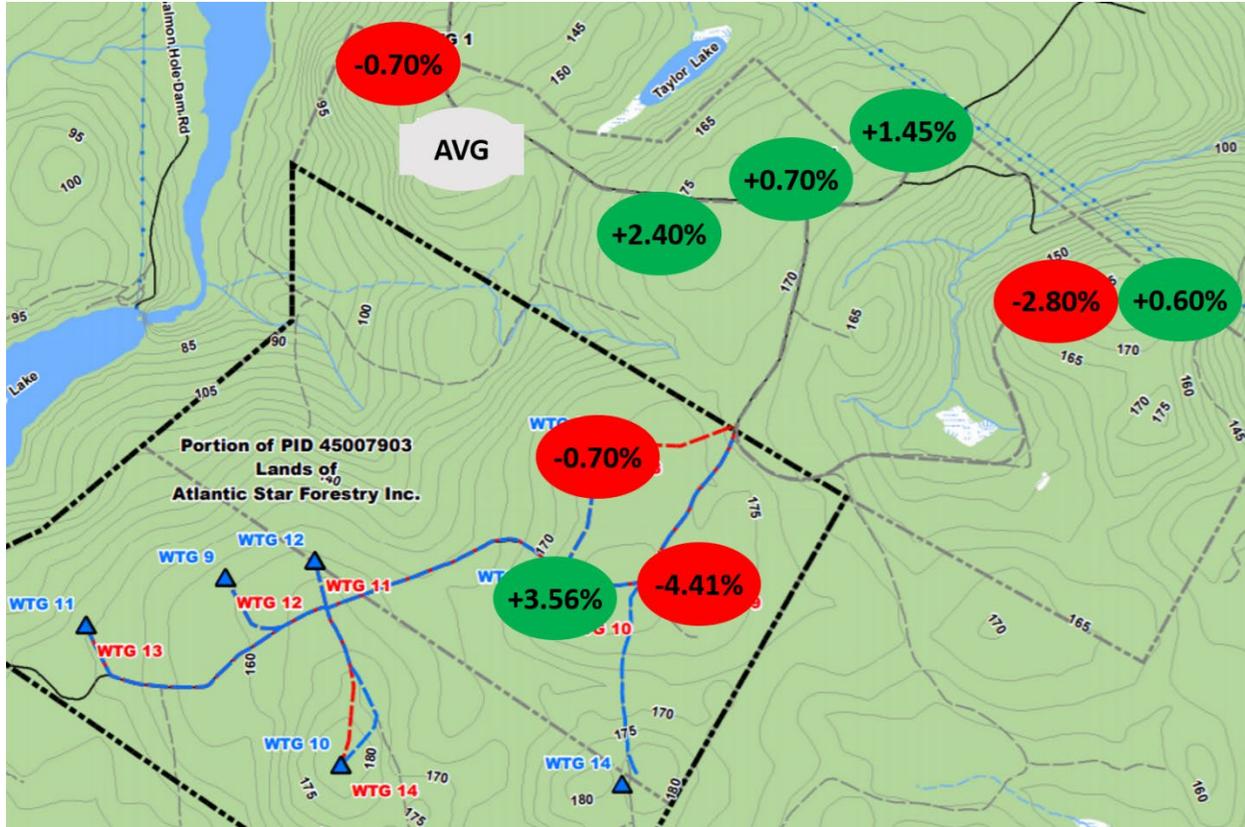


Figure 1 – Per turbine production relative to site average turbine, April 2018-Mar 2020 inclusive.

As expected, the Phase 1 turbines are the top performers. The best turbine on site is unexpectedly one of the Phase 3 turbines at 3.56% above the site average.



Figure 2 depicts how each turbine’s production over the past two fiscal years compares to the estimate established at investment decision.

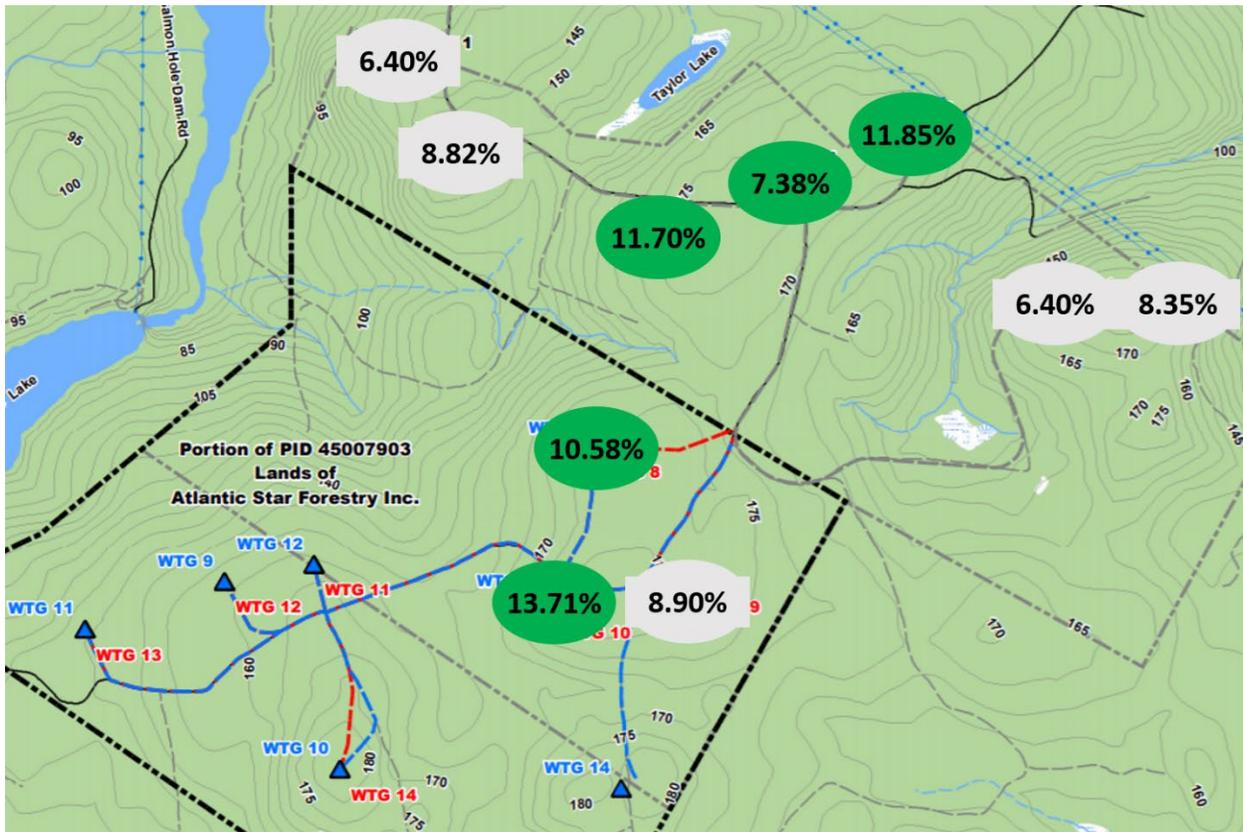


Figure 2 – Per turbine production April 2018-Mar 2020 inclusive relative to that turbine’s preconstruction estimate.

Notice that each turbine produced more than its investment assumption in the past two fiscal years. It is further noteworthy that the highest elevation turbines have overproduced the most (depicted as green). This roughly suggests that the wind flow modelling at Ellershouse, which used to generate the investment case financial models, underestimates the production at higher elevations the most. Therefore, it is important to focus on higher elevation sites for potential expansion, regardless of the suggestions from the wind flow modeling software.



## Enercon performance/uptime (F19-20)

Phase	Reporting Period (%)	Fiscal YTD (%)	EPK Performance Expectation (%)
One		98.25	97.4
Two		98.71	97.4
Three		98.41	96.4

Enercon performance has been compliant with our contract. Highlights:

- AREA continues to dispute a lightning strike invoice. Enercon hasn't mentioned it in months. Value is less than \$10,000.

## Non-Enercon performance

### Outages for the fiscal year

Outage Start Date	Reason	Estimated Loss	
2019-04-04	NSPI opened 17V breaker, issue on Burlington line	\$ 9,400	
2019-06-21	NSPI opened 17V breaker, issue near StCroix	\$ 2,000	
2019-08-31	Switch maintenance by AREA - Enercon MV and basement inspections		
2019-09-07	Hurricane Dorian		included in curtailment document
2019-09-26	Switch maintenance by AREA - Enercon MV and basement inspections		

### Curtailments and Associated Lost Production Opportunity

27 curtailments in sum during this fiscal year.

24 of the 27 curtailments were due to low Provincial electrical load (wind energy facilities are scaled back to manage the grid).

The other 3 were system emergencies (NSPI IT systems failure, Hurricane Dorian, inter-provincial transmission line failure).

\$48,687 estimated lost revenue opportunity in this fiscal year, with 71% of that caused by the three system emergencies.



*Electrical Losses and Parasitic Consumption*

Enercon SCADA production (at the turbine) compared to NSPI at interconnection:

Electrical loss & parasitic consumption: 2.6%

Which is just slightly higher than the investment decision assumption of 2.5%

*OPERATIONAL COMMENTS*

Asset is healthy, Fiscal Year production slightly exceeded budget.

