

# How to generate turbine estimates

## Tutorial Summary:

Learn how to generate gross turbine wind speed and energy estimates using one (or many) power curves.

- 1) Create wind flow model
  - See tutorial
- 2) Import turbine sites
  - Save turbine latitude and longitude (decimal degrees) to a .csv file
    - Name, Latitude, Longitude

	A	B	C	D
1	1	25.14716	-73.9204	
2	2	25.14689	-73.9177	
3	3	25.1477	-73.9144	
4	4	25.14752	-73.9111	
5	5	25.14843	-73.9088	
6	6	25.15248	-73.9232	
7	7	25.153	-73.9212	
8	8	25.15359	-73.9194	
9	9	25.15627	-73.9112	
10	10	25.15633	-73.9091	
11	11	25.16032	-73.9073	

- Go to 'Input' tab
- Click 'Import' under 'Turbine Sites' as shown below

The screenshot shows the Continuum software interface. The 'Input' tab is selected. In the 'Turbine Sites' section, the 'Import' button is highlighted with a red box. The 'Met Site Summary' table shows three sites: Met\_1\_LT, Met\_2\_LT, and Met\_3\_LT. The 'List of Turbines' table shows 11 turbines. The 'Wind Rose at Met Sites' and 'Directional WS Ratios at Met Sites' charts are visible. The 'Met Sites' and 'Turbine Locations' lists are also shown.

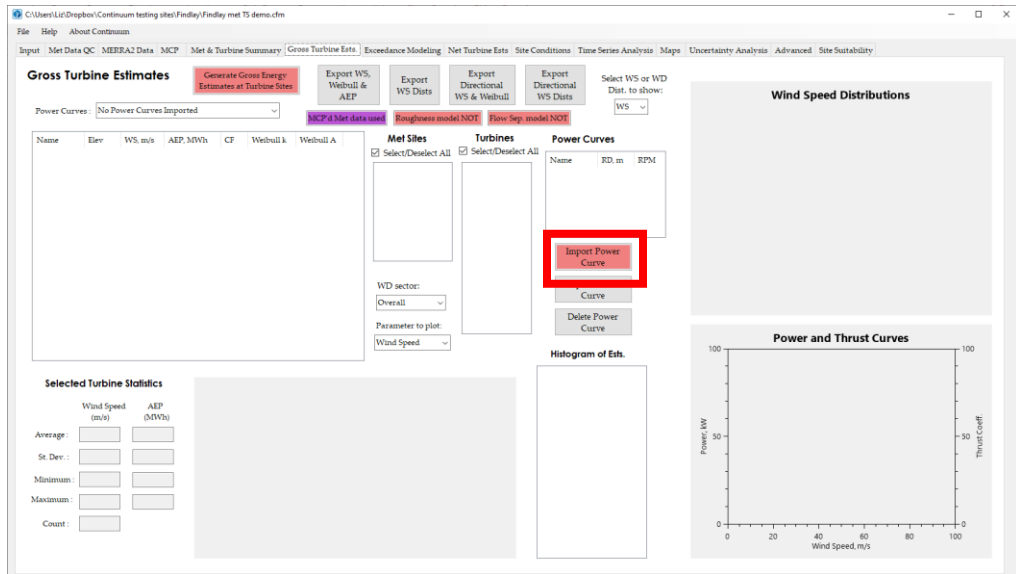
Met Name	UTMX	UTMY	80 m Wind S...
Met_1_LT	7.322	7.292	
Met_2_LT	7.292	6.945	
Met_3_LT	6.945		

Name	UTMX	UTMY
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		

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## 3) Import power curve

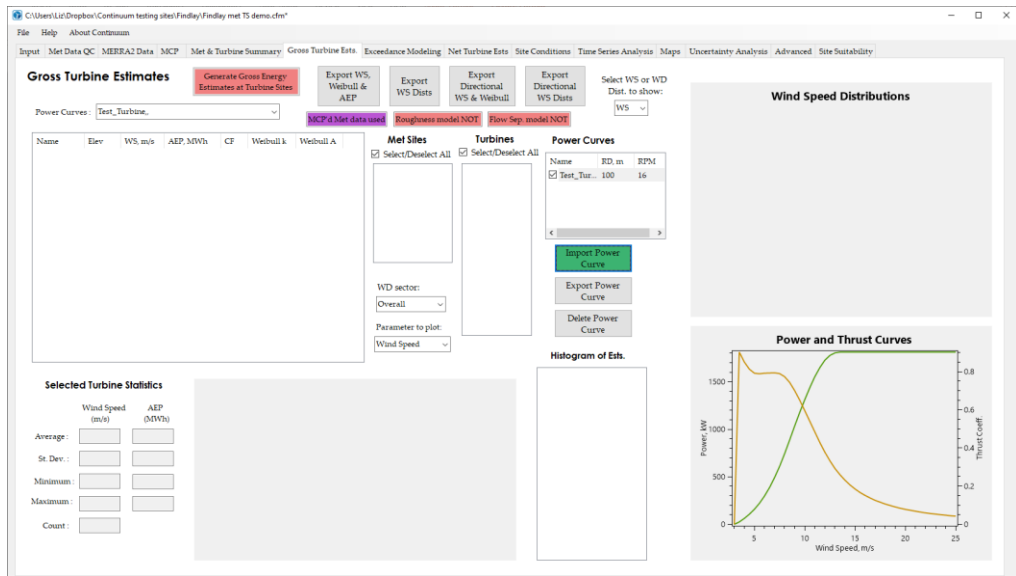
- Go to 'Gross Turbine Ests.' tab
- Click 'Import Power Curve'



- Power curve file format:
  - Name
  - Wind speed (m/s), Power (kW), Thrust coefficient

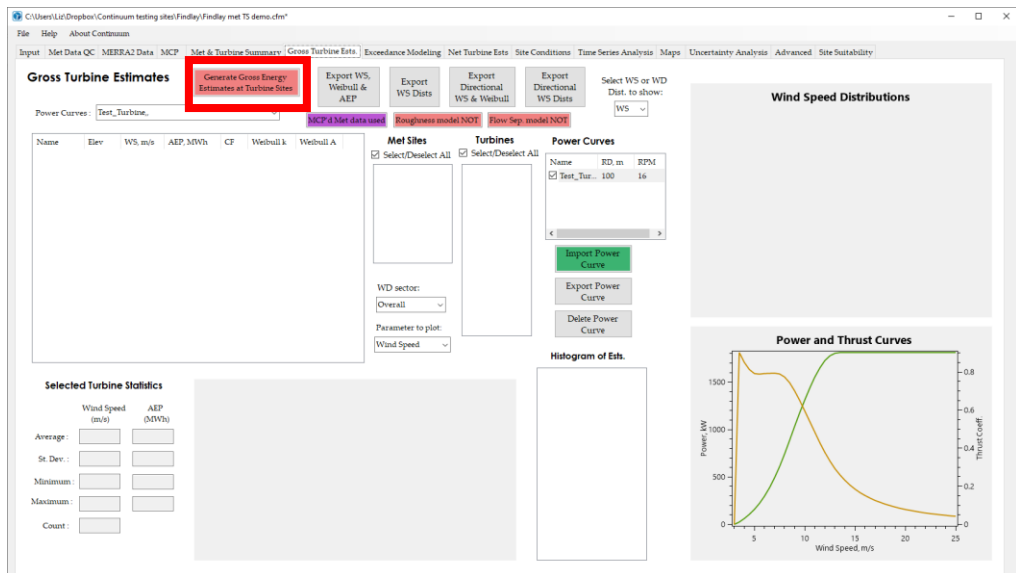
	A	B	C
1	Test_Turbine		
2	3	0	0
3	3.5	26.46	0.9024
4	4	62.72	0.85056
5	4.5	106.82	0.81312
6	5	158.76	0.792
7	5.5	222.46	0.78912
8	6	297.92	0.792
9	6.5	387.1	0.79296
10	7	491.96	0.79392
11	7.5	609.56	0.79008
12	8	742.84	0.77376
13	8.5	886.9	0.744
14	9	1034.88	0.7008
15	9.5	1177.96	0.65088
16	10	1312.22	0.59616
17	10.5	1437.66	0.54048
18	11	1554.28	0.4848
19	11.5	1650.32	0.42912
20	12	1727.74	0.37824
21	12.5	1777.72	0.33312

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## 4) Generate gross energy estimates

- Click 'Generate Gross Energy Estimates at Turbine Sites'



- Export gross energy estimates. Choose to export:
  - Gross wind speed, Weibull A and k, annual energy production (AEP)
  - Gross wind speed distributions
  - Gross directional wind speeds and Weibull parameters
  - Gross directional wind speed distributions

# How to generate turbine estimates

**Gross Turbine Estimates**

Power Curves: Test\_Turbine

Export WS, Weibull & AEP

Name	Elev	WS, m/s	AEP, MWh	CF	Weibull k	Weibull A
Met_1_LT	327.3	7.322	6093	38.1	2.64	8.24
Met_2_LT	335.1	7.292	5993	37.7	2.66	8.2
Met_3_LT	315	6.945	5416	34.1	2.62	7.82
1	322.2	7.108	5711	35.9	2.58	8.01
2	330.5	7.208	5856	36.8	2.64	8.11
3	330.1	7.232	5898	37.1	2.64	8.14
4	334.6	7.287	5981	37.6	2.68	8.2
5	334.3	7.299	5994	37.7	2.68	8.21
6	330.1	7.157	5773	36.3	2.64	8.06
7	330	7.185	5819	36.6	2.64	8.09
8	329.2	7.184	5819	36.6	2.64	8.09
9	329.6	7.271	5964	37.5	2.64	8.18
10	338.4	7.336	6060	38.1	2.7	8.25
11	330.1	7.316	6033	37.9	2.68	8.23
12	330.4	7.318	6037	38.0	2.66	8.23
13	330	7.324	6050	38.0	2.66	8.24

Selected Turbine Statistics

Wind Speed (m/s)	AEP (MWh)
Average: 7.243	5917
St Dev.: 0.067	106
Minimum: 7.108	5711
Maximum: 7.336	6060
Count: 15	

Histogram of Met and Turbine 80 m Wind Speeds

Wind Speed Distributions

Power and Thrust Curves

Histogram of Esth.

- Import additional power curves (optional) and toggle between power curves in dropdown menu as shown below.

**Gross Turbine Estimates**

Power Curves: Test\_Turbine

Export WS, Weibull & AEP

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Histogram of Met and Turbine 80 m Wind Speeds

Wind Speed Distributions

Power and Thrust Curves

Histogram of Esth.