

# Feature Descriptions

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## 1 Solar Track

Table 1: Features for the solar track.

Feature Number	Description	Unit	Derived or Given
1	Total column liquid - Vertical integral of cloud liquid water content	$\frac{kg}{m^2}$	Given
2	Total column ice water - Vertical integral of cloud ice water content	$\frac{kg}{m^2}$	Given
3	Surface Pressure	$Pa$	Given
4	Relative Humidity at 1000 mbar	%	Given
5	Total cloud cover	(0, 1)	Given
6	10m U wind component	$\frac{m}{s}$	Given
7	10m V wind component	$\frac{m}{s}$	Given
8	2m temperature	$K$	Given
9	Surface solar radiation downward	$\frac{J}{m^2}$	Given
10	Surface thermal radiation downward	$\frac{J}{m^2}$	Given
11	Top net solar radiation - Net solar radiation at the top of the atmosphere	$\frac{J}{m^2}$	Given
12	Total precipitation - Convective precipitation + stratiform precipitation	$m$	Given
13	10m speed magnitude - $w_s = \sqrt{u^2 + v^2}$	$\frac{m}{s}$	Derived
14	Total cloud cover $\times$ surface solar radiation	$\frac{J}{m^2}$	Derived
15	Total cloud cover $\times$ relative humidity	%	Derived
16	Freezing temperature flag - 2m temperature $< 32$	0/1	Derived
17	Precipitation flag - Total precipitation $> 0$	0/1	Derived
18	Snow flag - (2m temperature $< 32$ ) $\times$ (Total precipitation $> 0$ )	0/1	Derived
19	Differential of surface pressure - $sp_{t+1} - sp_t$	$Pa$	Derived
20	Differential of total cloud cover - $tcc_{t+1} - tcc_t$	(0, 1)	Derived
21	Wind chill index - $(10 \cdot \sqrt{w_s} - w_s + 10.5) \cdot (33 - T_a) - T_a$ = 2m temperature in Celsius	$\frac{kg}{h}$	Derived
22	Solar module temperature - $T_a + e^{-3.473-0.0594 \cdot w_s}$	$^{\circ}C$	Derived
23	Maximum solar power output for the day for zone 1	$Kwh$	Given
24	Maximum solar power output for the day for zone 2	$Kwh$	Given
25	Maximum solar power output for the day for zone 3	$Kwh$	Given
26	Day of the year - $\cos(\frac{day}{365} 2\pi)$	(-1, 1)	Derived
27	Day of the year - $\sin(\frac{day}{365} 2\pi)$	(-1, 1)	Derived
28	Hour of the day - $\cos(\frac{hour}{24} 2\pi)$	(-1, 1)	Derived
29	Hour of the day - $\sin(\frac{hour}{24} 2\pi)$	(-1, 1)	Derived

Table 2: Features for the wind track.

Feature Number	Description	Unit	Derived or Given
<b>1</b>	10m azimuthal wind speed ( $u$ )	$\frac{m}{s}$	Given
<b>2</b>	10m meridional wind speed ( $v$ )	$\frac{m}{s}$	Given
<b>3</b>	100m azimuthal wind speed ( $u$ )	$\frac{m}{s}$	Given
<b>4</b>	100m meridional wind speed ( $v$ )	$\frac{m}{s}$	Given
<b>5</b>	10m wind speed magnitude - $w_s = \sqrt{u^2 + v^2}$	$\frac{m}{s}$	Derived
<b>6</b>	100m wind speed magnitude - $w_s = \sqrt{u^2 + v^2}$	$\frac{m}{s}$	Derived
<b>7</b>	Wind shear - $\ w_s(100) - w_s(10)\ $	$\frac{m}{s}$	Derived
<b>8</b>	10m quadratic wind speed $w_s^2$	$\frac{m^2}{s^2}$	Derived
<b>9</b>	100m quadratic wind speed $w_s^2$	$\frac{m^2}{s^2}$	Derived
<b>10</b>	10m cubic wind speed $w_s^3$	$\frac{J}{m^2}$	Given
<b>11</b>	100m cubic wind speed $w_s^3$	$\frac{J}{m^2}$	Given
<b>12</b>	Day of the year - $\cos(\frac{day}{365}2\pi)$	$(-1, 1)$	Derived
<b>13</b>	Day of the year - $\sin(\frac{day}{365}2\pi)$	$(-1, 1)$	Derived
<b>14</b>	Hour of the day - $\cos(\frac{hour}{24}2\pi)$	$(-1, 1)$	Derived
<b>15</b>	Hour of the day - $\sin(\frac{hour}{24}2\pi)$	$(-1, 1)$	Derived

Table 3: Features for the price track.

Feature Number	Description	Unit	Derived or Given
<b>1-25</b>	Forecasted zonal load at each hour of the previous day and the current time	$kWh$	Given
<b>26-51</b>	Forecasted total load at each hour of the previous day and the current time	$kWh$	Given
<b>52-76</b>	Price at each hour of the previous day	\$	Given
<b>77</b>	Standard deviation of the price during the previous day	\$	Derived
<b>78</b>	Maximum price variation during the previous day in 1 hr interval	\$	Derived
<b>79</b>	Maximum price variation during the previous day in 2 hr interval	\$	Derived
<b>80</b>	Maximum price variation during the previous day in 3 hr interval	\$	Derived
<b>81</b>	Day of the year - $\cos(\frac{day}{365}2\pi)$	$(-1, 1)$	Derived
<b>82</b>	Day of the year - $\sin(\frac{day}{365}2\pi)$	$(-1, 1)$	Derived
<b>83</b>	Day of the week - $\cos(\frac{weekday}{7}2\pi)$	$(-1, 1)$	Derived
<b>84</b>	Day of the week - $\sin(\frac{weekday}{7}2\pi)$	$(-1, 1)$	Derived
<b>85</b>	Weekend Flag	0/1	Derived