



DE HAAGSE
HOGESCHOOL

Renewable power plant

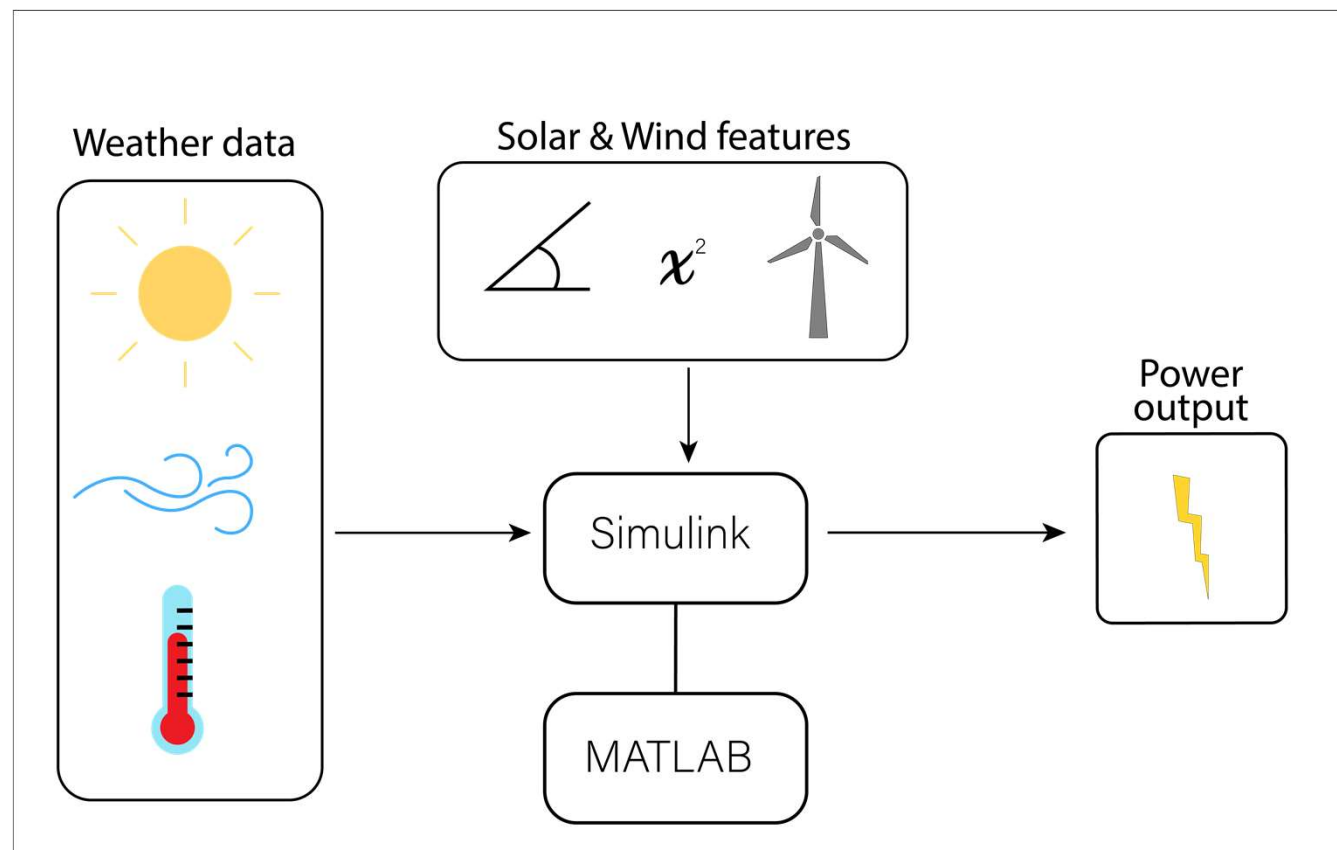
Introductie

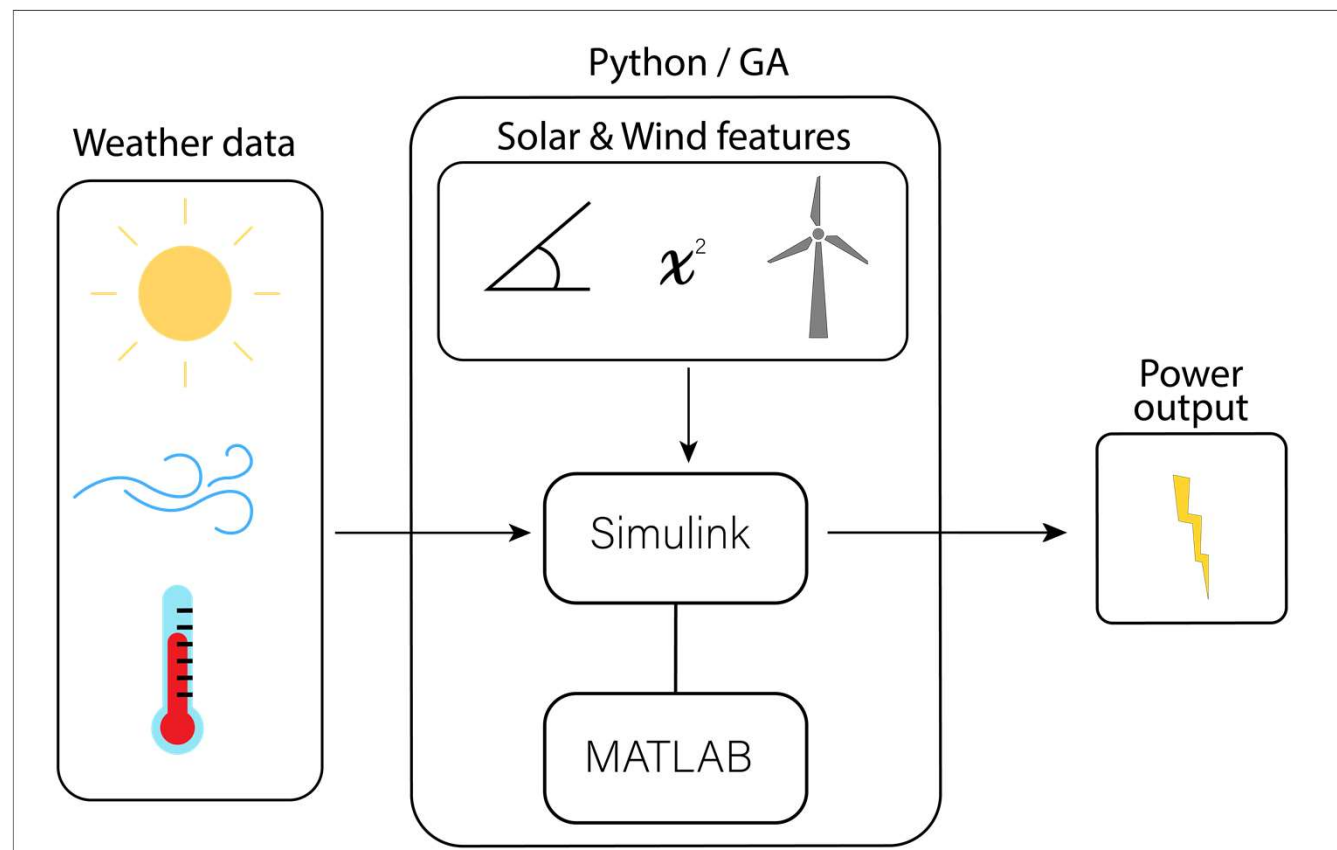
Aanpak

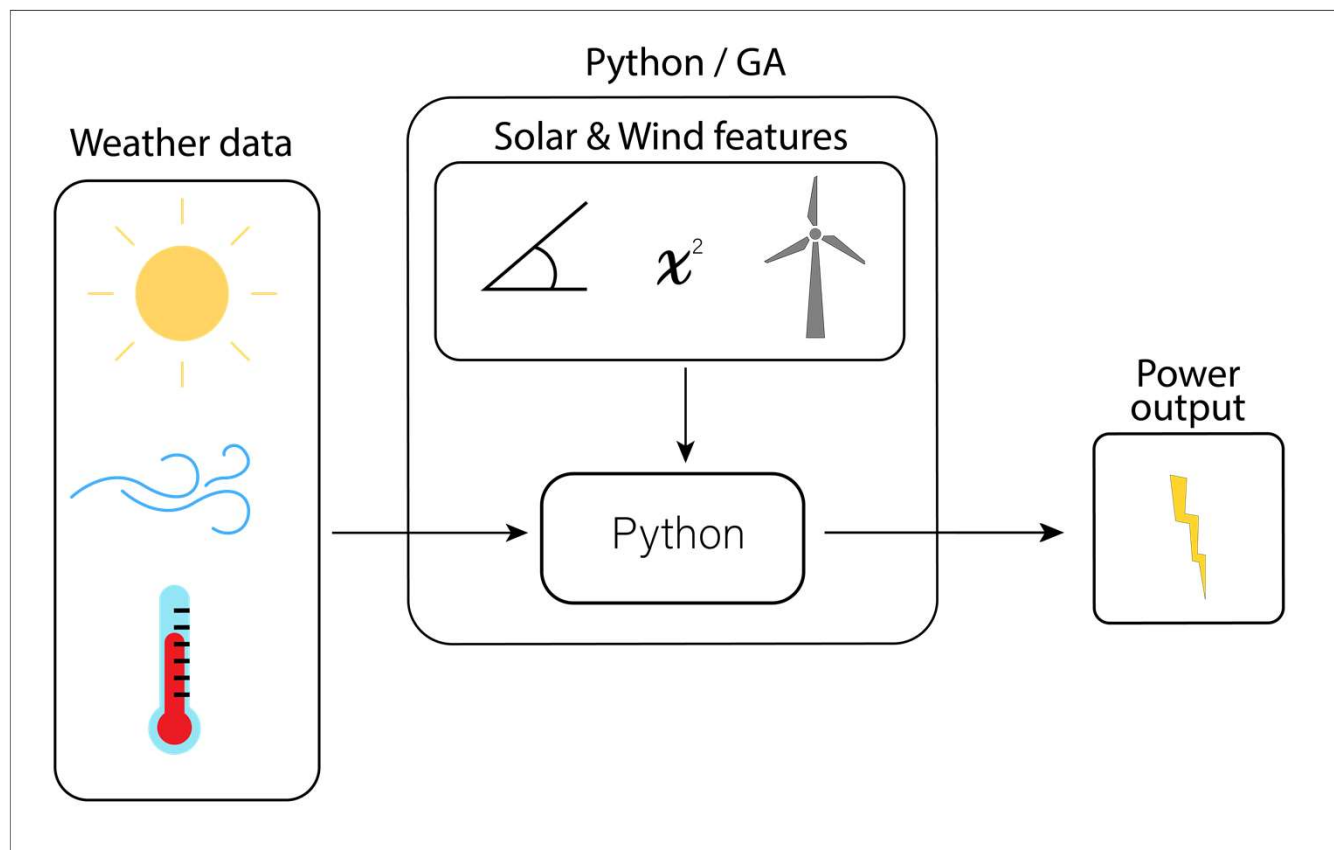
Power output analyses

Demonstratie GUI

voortgang

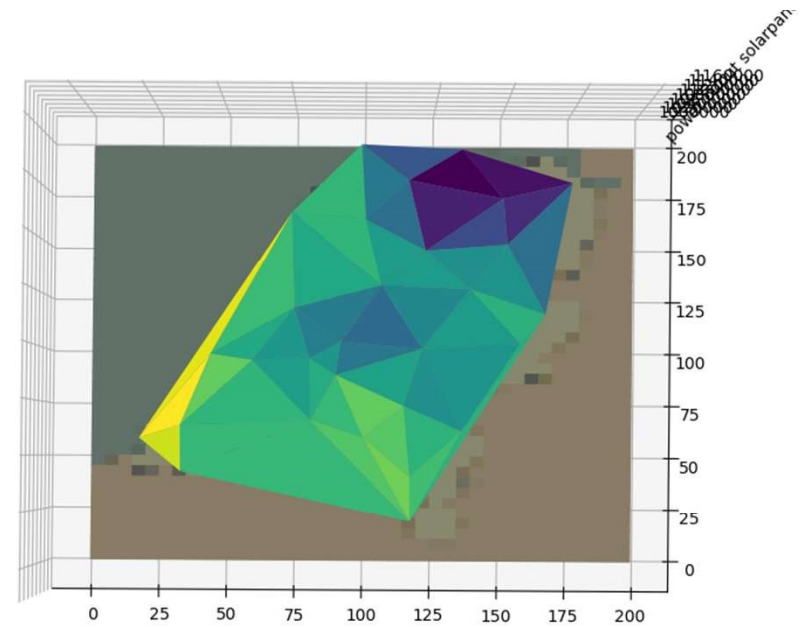
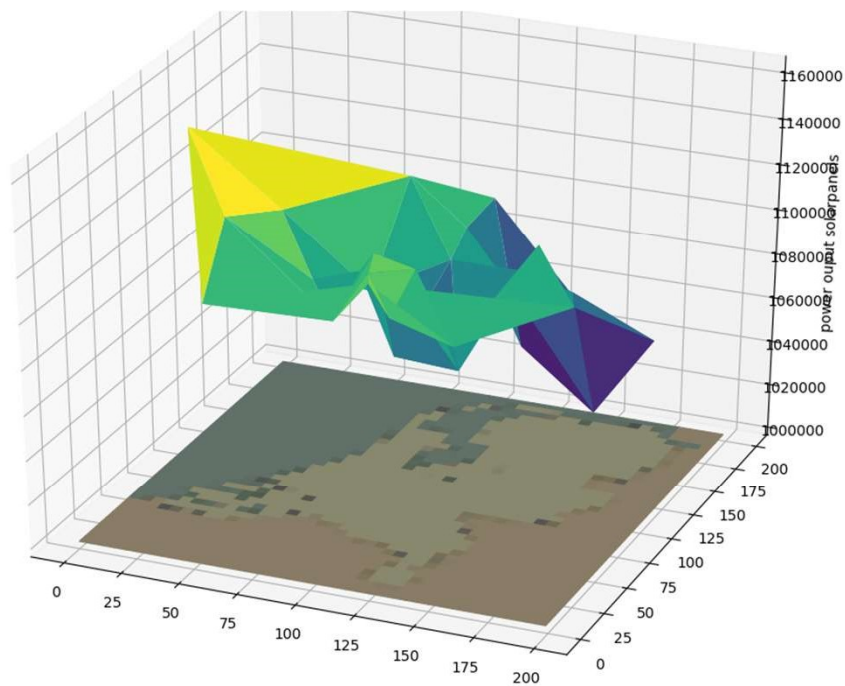






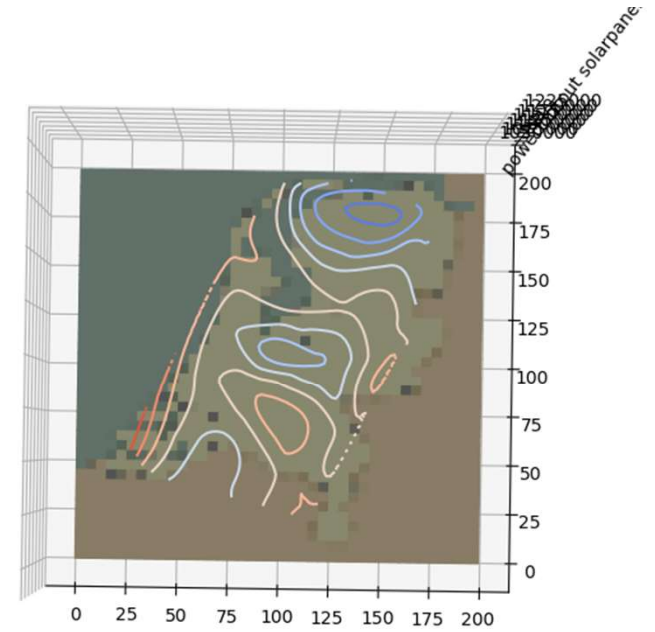
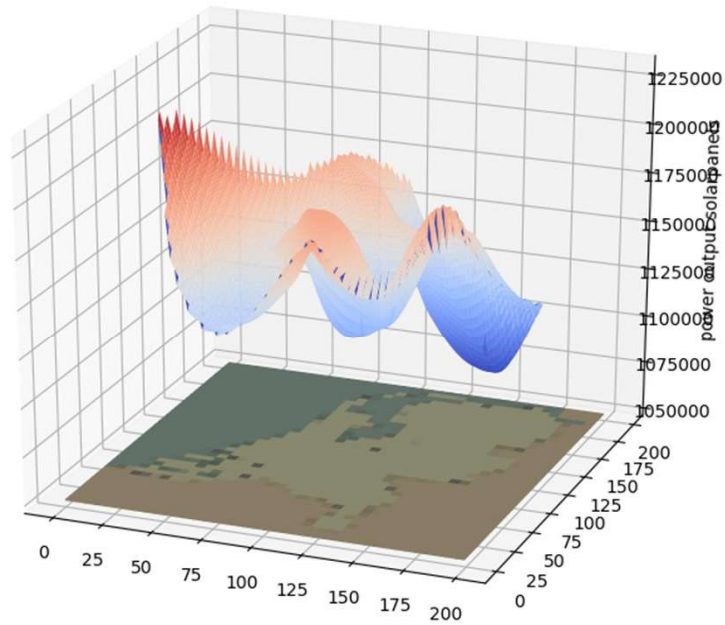
Python out vs Simulink out

	Python			Simulink	
	Pwt	Psp		Pwt	Psp
0	2155,76825	0		2155.8	0
1	2155,76825	0		2155.8	0
2	1371,587987	0		1371.6	0
3	1371,587987	0		1371.6	0
4	0	0		0	0
5	0	0		0	0
6	0	0		0	0
7	0	0		0	0
8	0	0		0	0
9	0	0,124303481		0	0.12
10	0	1,221198079		0	1.22
11	796,9770212	2,667748032		796.98	2.67
12	2155,76825	3,96270512		2155.8	3.96
13	3164,228132	3,392796115		3164.2	3.39
14	4421,337168	2,490058039		4421.3	2.49
15	3164,228132	0,514581638		3164.2	0.51
16	4421,337168	0,201597795		4421.3	0.2
17	3164,228132	0		3164.2	0
18	1371,587987	0		1371.6	0
19	1371,587987	0		1371.6	0
20	0	0		0	0
21	0	0		0	0
22	3164,228132	0		3164.2	0
23	8408,764227	0		8408.8	0



Power output per PV-paneel

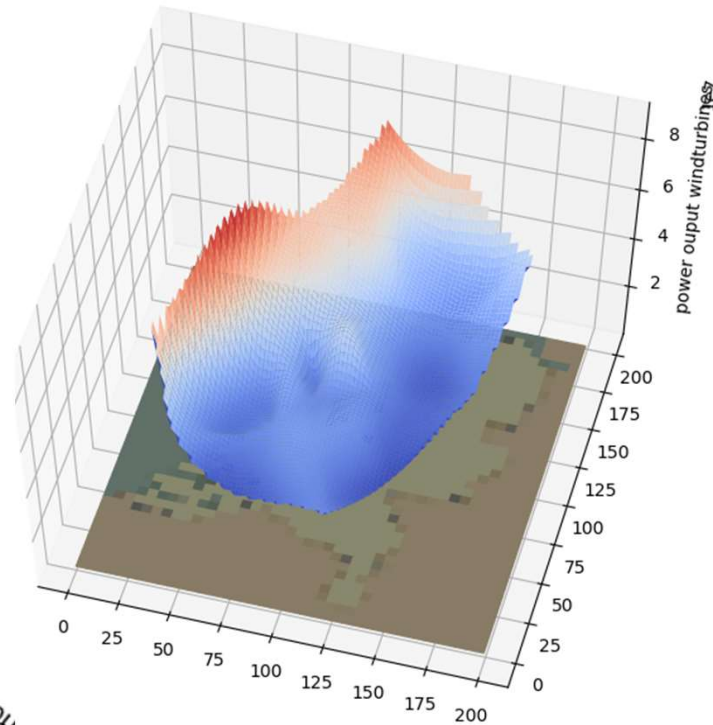
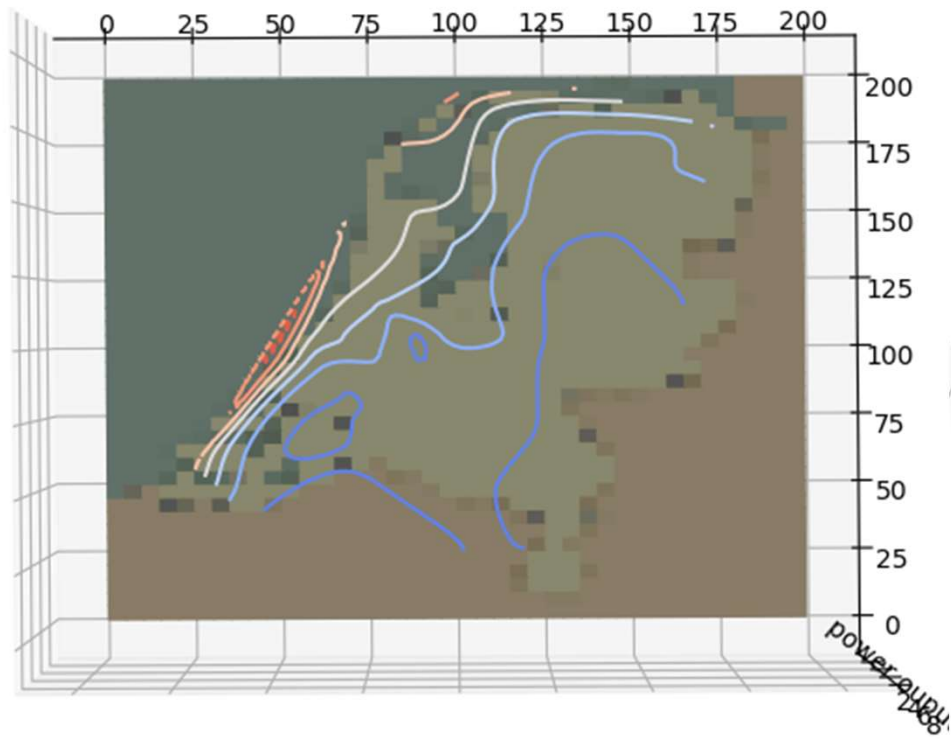
PV-panelen naar het zuiden met een hoek van 37 graden

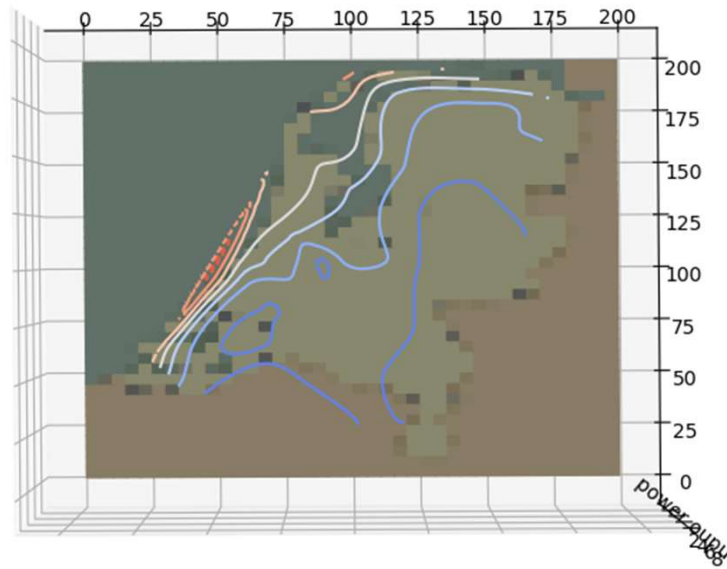
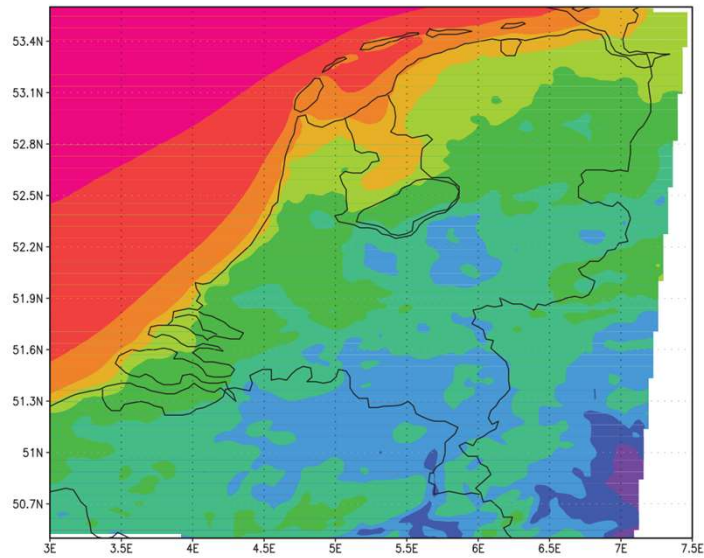


Power output per PV-paneel

Bicubic Interpolation

Power output per windturbine



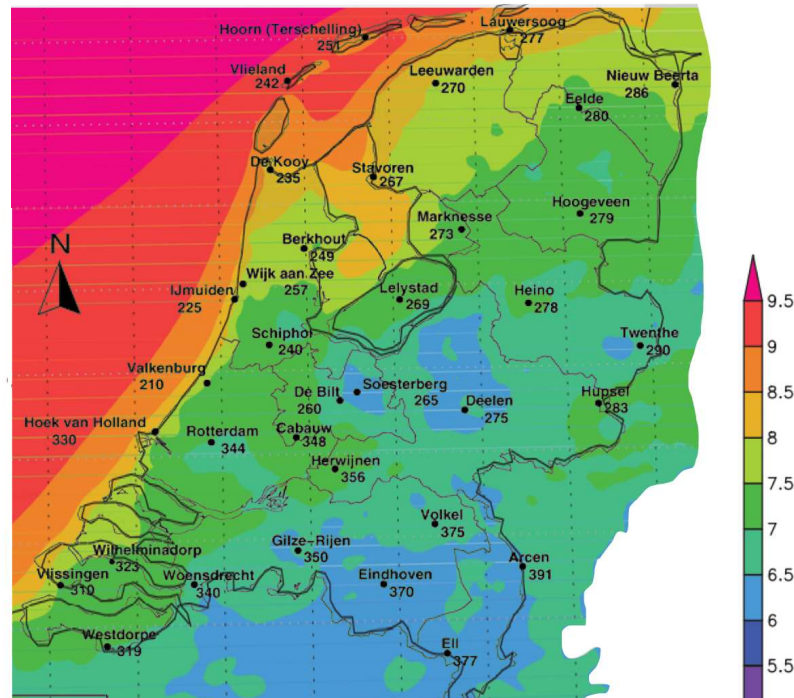
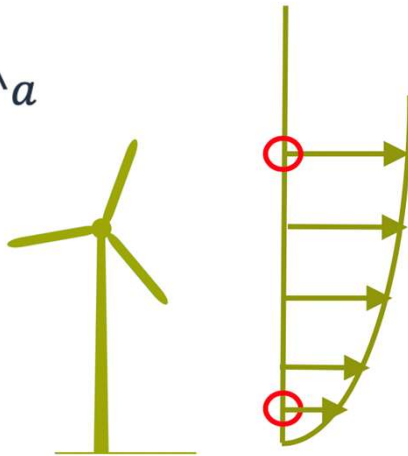


vergelijking KNMI data met
wind turbine power output

Terrein factor berekenen

- Invoer windsnelheid 10m hoogte
- Gemiddelde windsnelheid op 100m
- Berekenen van "a"

$$v_2 = v_1 \cdot \left(\frac{z_2}{z_1}\right)^a$$



Source: KNMI

Terrein factor

NAME	terraingesteldheid	gemiddeldewind
VALKENBURG	0.143	5.393
DEKOOY	0.182	5.265
SCHIPHOL	0.164	4.797
HOORNTERSCHELLING	0.147	6.056
DEBILT	0.286	3.364
SOESTERBERG	0.200	3.786
STAVOREN	0.171	5.391
LELYSTAD	0.221	4.208
LEEUWARDEN	0.246	4.535
MARKNESSE	0.246	3.968
DEELEN	0.251	3.645
LAUWERSOOG	0.119	6.086
HEINO	0.376	2.943
HOOGVEEN	0.255	3.887
EELDE	0.247	3.963
HUPSEL	0.328	3.290
NIEUWBEERTA	0.198	4.759
TWENTHE	0.268	3.506
VLISSINGEN	0.103	5.909
WESTDORPE	0.253	3.911
WILHELMINADORP	0.185	4.575
HOEKVANHOLLAND	0.069	6.823
ROTTERDAM	0.197	4.127
CABAUW	0.232	4.108
GILZERIJEN	0.255	3.616
HERWIJNEN	0.278	3.694
EINDHOVEN	0.224	3.582
VOLKEL	0.269	3.502
ELL	0.257	3.318
MAASTRICHT	0.208	3.717
ARCEN	0.380	2.712

Demonstratie GUI



Voortgang

- ▶ Paper
- ▶ Creëren executable





Questions?

