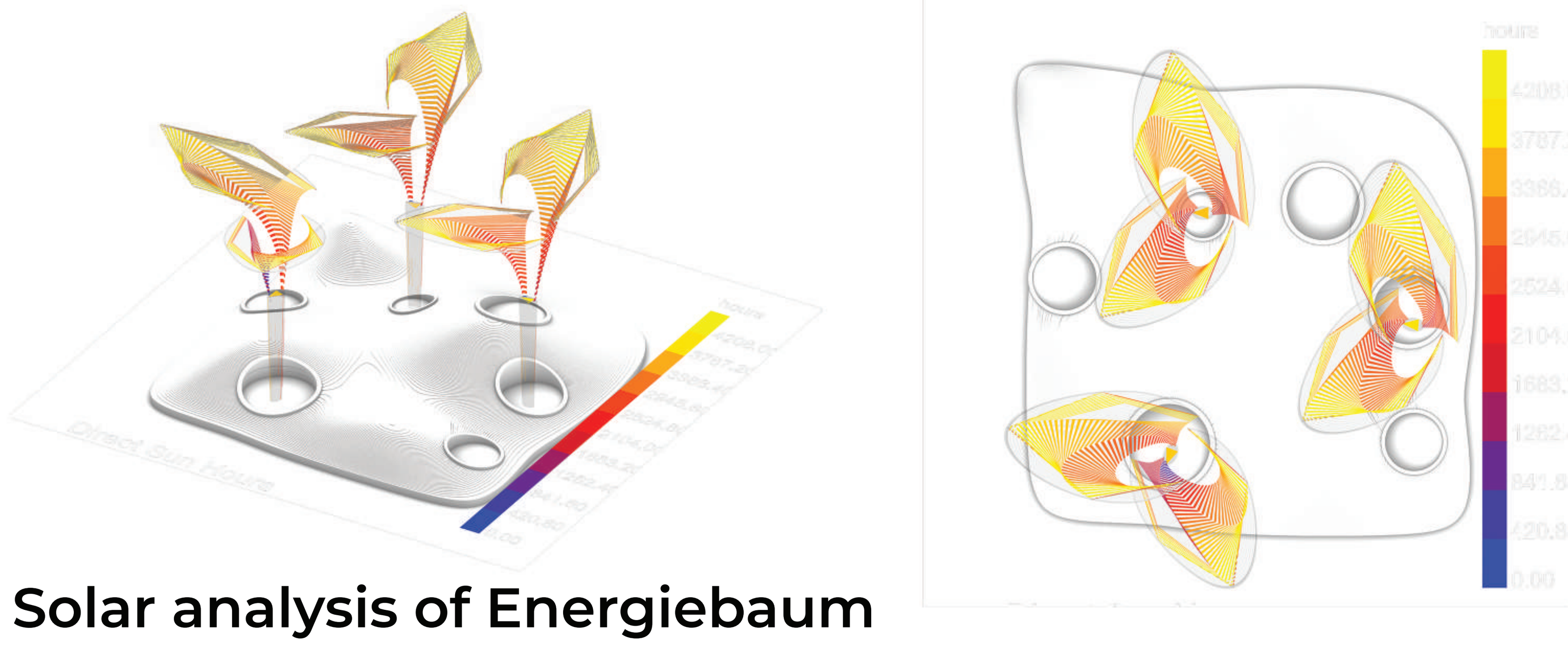
Time sensetive yet energy collecting dynamic art

Groundwater recharge calculations

Catchement = 24 sq.m.
258.336 sq.ft.
x 0.622 X 30 inches of rainfall per year
= 4,828.29 gallons
= 18,277 liters per Energiebaum



Solar analysis of Energiebaum

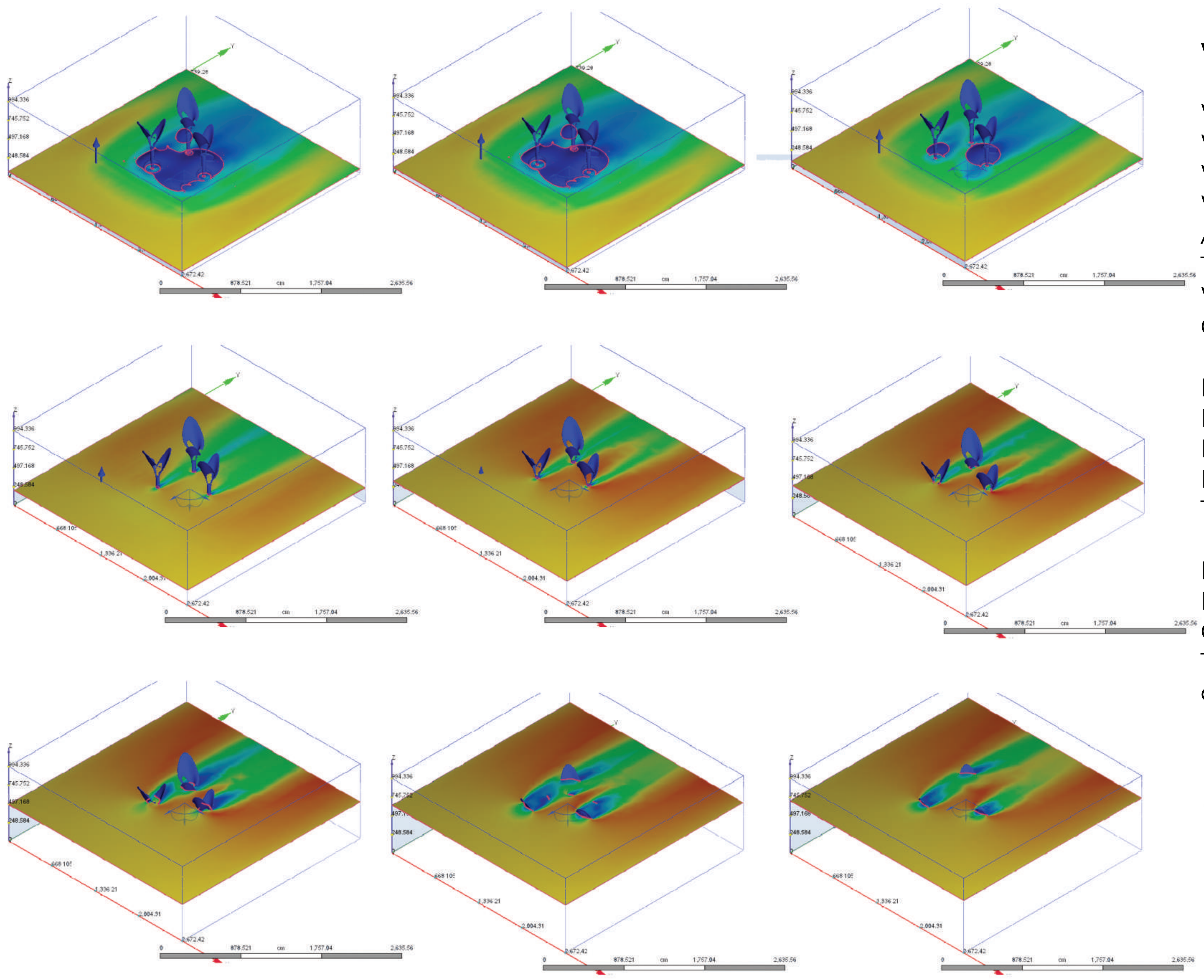
Solar analysis calculations

E = A x r x H x PR is followed to estimate the electricity generated

E = 24 x 20 x 5.01 x 0.75
E = 1803.60kwH

Considering a maximum of 20% in losses while converting from DC to AC

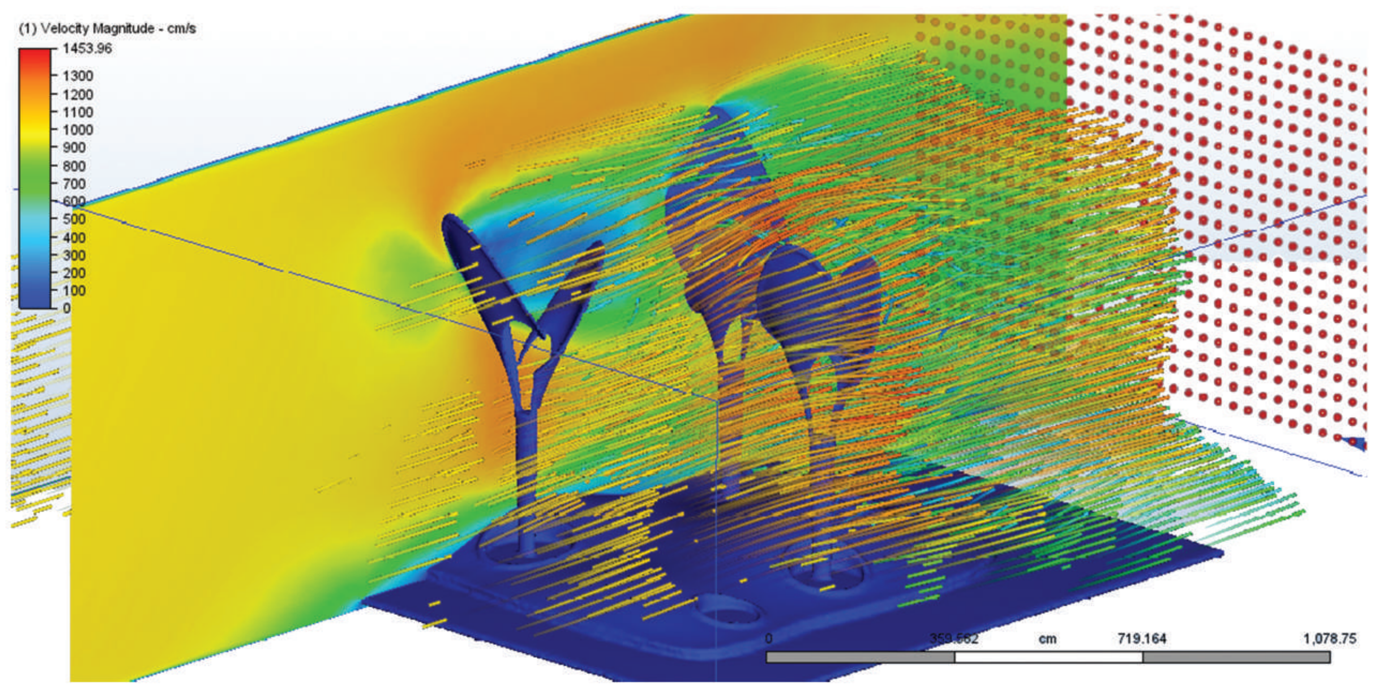
E = 1803.60kwH x 80%
E = 1442.88 kWh per Energiebaum



Wind analysis calculations:

Wind turbine type:	VAVT
Wind turbine diameter	4 m
Wind turbine height	4 m
Wind speed	15.6 kmph
Available wind power	0.799 kW
Turbine efficiency	30%
Wake losses	5%
Output power before losses	0.228 kW
Losses	
Mechanical losses	0.2%
Electrical losses on turbine	1.5%
Electrical losses (transmission)	5%
Time out of order	3%
Expected output power	
Real efficiency	25.817%
Output power with losses	0.206 kW
Total operational time considered	14 hrs

One Vertical axis wind turbine generates 0.206 x 14hours x 365days of power = **1052.66kWh per Energiebaum**



Wind analysis of Energiebaum

Wind analysis inferences:

The adjacent diagrams to the left show the wind flow in a cluster of Energiebaums at progressively increasing heights.

It is evident that these structures allow wind to flow smoothly at all levels due to the unique design of the structures.

In fact the vertical axis wind turbine actually encourages wind movement by sharing wind between them.

Typical Energiebaum detail diagram

The water catchement trough:

The TPV leaf blade doubles up as a water catchment trough which directs the rainwater and melted snow water back to the ground therby increasing the groundwater table.

The vertical axis wind turbine rotors:

Depending on the time of the day and the amount of solar radiation, the TPV blades change their position and become a vertical axis wind turbine enabling energy generation 24/7.

Intelligent light sensors:

The light sensors determine the optimal solar angle for the TPV leaf blades ensuring maximum solar radiation on the required surfaces throughtout the year.

The water catchement trough:

The TPV leaf blade directs the solar radiation to solar collectors below it thus generating heat energy and converting it to electricity via photons.

The Energiebaum shaft:
The shaft carries the water line to recharge the water directed from the leaf blades.
It also houses the electrical return cables to direct the electricity generated to the required destination.