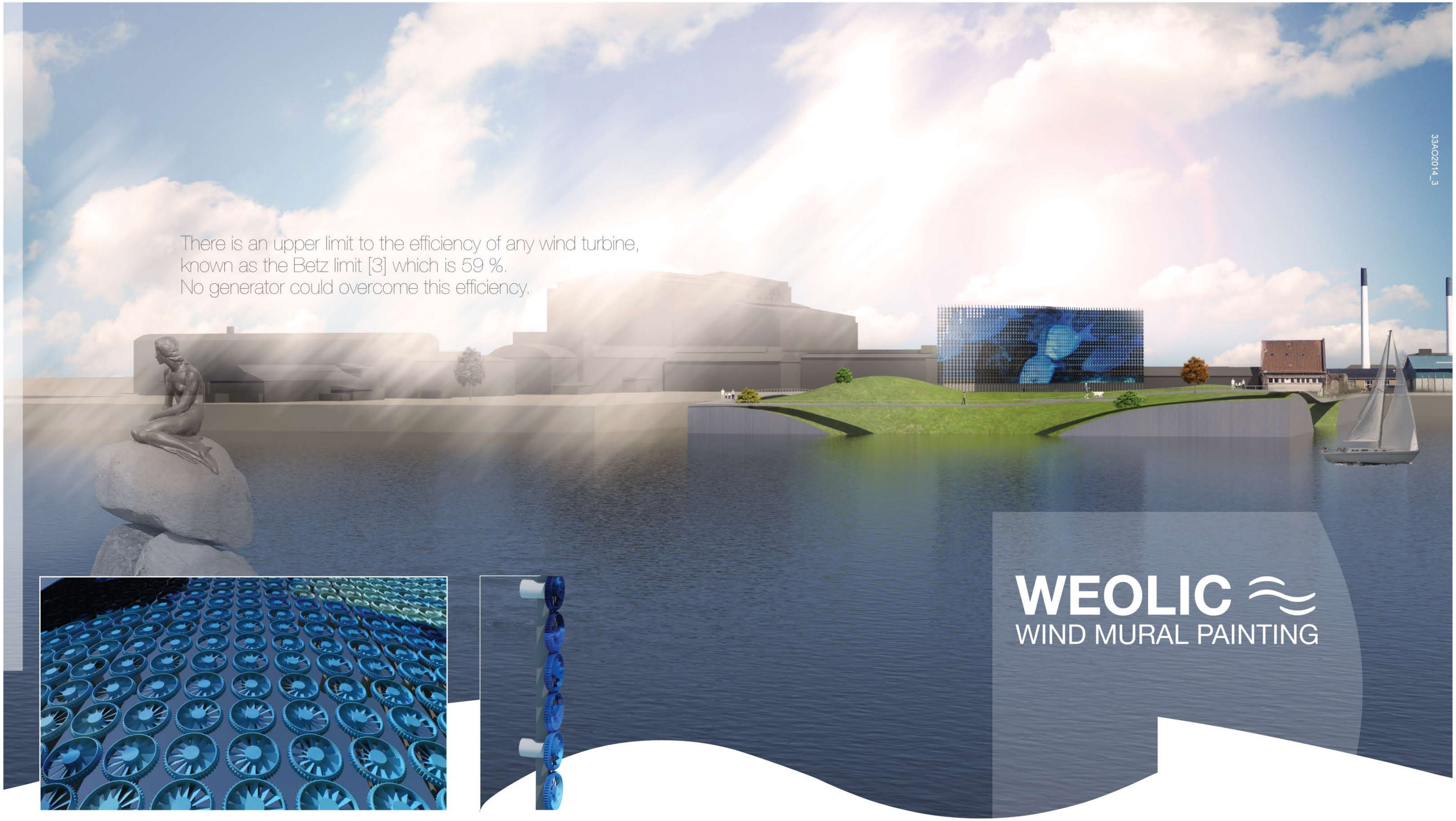
There is an upper limit to the efficiency of any wind turbine,
known as the Betz limit [3] which is 59 %.
No generator could overcome this efficiency.



WEOLIC
WIND MURAL PAINTING

Technology and list of the primary materials used in our design

The energy-generating system consists on an undulating screen that measures 80 meters long and 30 meters high.

This screen is composed of stainless steel columns as a main structure. Horizontal stainless steel tubes configure a secondary structure, supporting 50 cm radius recycled plastic micro turbines and adding rigidity to the structure. Small electric generators are fixed to this structure as well.

Micro turbines are interconnected vertically by gear teeth, improving the system´s efficiency by allowing to install one generator every 4 turbines.

The energy produced by each generator is driven to transformers located in an engine room buried 1 meter deep under the screen; contained between concrete foundation bases for steel columns. Each column supports 6 sets of 1 generator with 4 microturbines (24 turbines per column)

Estimated annual kWh (kilowatt-hours) generated by our design

Based on data [1] presented by MotorWaveGroup
with wind speeds 5m/second , they predict that 20 turbines (1 square meter of total area) could generate 15 Watts of power.
The calculations to obtain that number (as detailed in [2]) are the following:

Air density at sea level = 1.23 kg/m3

Turbine area = PI x radio2
Kinetic energy = 0.5 x mass x speed2
mass /second = speed (m/s) x area (m2) x density (kg/m3)
Wind Power (Watts) = 0.5 x swept area x air density x speed3

In the case of 20 turbines of 26 cm in diameter (swept area = 1m2), the total wind power received by the system would be 4.08 Watts x 20 = 81.6 Watts
Therefore the efficiency of the system proposed by MotorWaveGroup may be calculated as follows

Efficency = Generated Power / Wind Power
Efficency = 15Watts / 81.6 Watts = 18.3 % in the best case scenario.

There is an upper limit to the efficiency of any wind turbine, known as the Betz limit [3] which is 59 %. No generator could overcome this efficiency.

In our proposal, supposing that the efficiency of our design is similar to the one proposed by MotorWaveGroup and the average wind speed is 5 m/s, we could estimate that the kWh generated could be 23,13 kWh:

Turbine area = PI x (0,5m)2
Turbines total area = 84 columns x 24 turbines x 0,78m2 = 1572 m2
Wind Power per turbine = 0.5 x 0,78 m2 x 1,23 kg/m3 x (5 m/s)3 = 60 Watts
Total power generated = 60 Watts x 84 columns x 24 turbines x 0,183 efficency
Total power generated = 22135 Watts or 23,13 kWh

GEAR TEETH ON PLASTIC TURBINES IMPROVE WIND EXPLOTTATION

SET OF 4 PLASTIC TURBINES CONNECTED TO GENERATOR