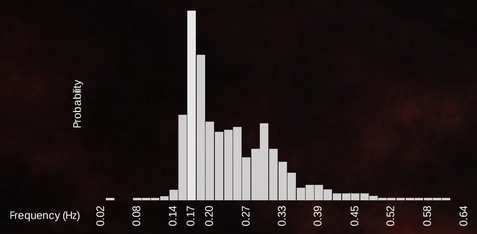
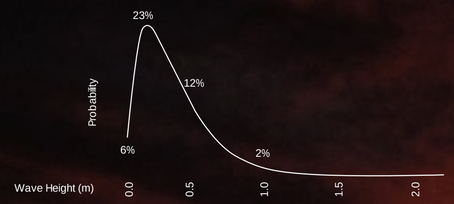
Energy Generator

Wave and Tidal spectrum



The variance density spectrum from a wave observation during one hour in the Baltic Sea[1] The most frequent rate is 0.17 Hz.



Most frequently occurring wave heights are represented by an interval of 0.15-0.24 m, waves within this interval occur 23% of the time while the mean wave height reaches 0.40 m.[2] The average tidal height is 0.1m. [3]

Gravitational Potential Energy

Prospective daily visit person-time is 10,000. Average soft surface steps-on times by individual is 20. The height of the surface will change with the height of 0.4m.

Basic Subjects' Attribute

	Number/Sensor Interface	Weight/Speed	Variance
Human	10,000 p.t/d	60kg/p	0.4m
Column	1,137	30kg/n	0.4m
Ocean Current	59.8 sq.m	1.5km/h[4]	0.5m

The Little Mermaid

Theoretical Energy Capacity

Annual Wave Energy

E_w= Wave Height(h) × Columns Number(n) × Column Weight(m) × Gravity(g) × Annual-second(t) × Convert Ratio (90%)/ Frequency(Hz)

E_w= 1,290,831,552,000 J

Gravitational Potential Energy

E_G= Visit Person-time(n_1) × Step Times(n_2) × Individual Weight(m) × Gravity(g) × Height(h) × Annual-day(t) × Convert Ratio (80%)

E_G= 17,169,600,000 J

Ocean Current Energy

E_O= Sensor Interface Area(sq.m) × Ocean Current Speed(m.s) × Annual-second(t) × Resistance (N) × Convert Ratio (30%)

E_O= 1,885,852,800,000 J

Purposes

Residential Electricity

E_w= 358,564 kWh

Self-sufficient Electricity

E_w= 4,796 kWh

Residential Electricity

E_w= 523,848 kWh

Annual Household Electricity Consumption in Copenhagen

1344 kWh (2010)[5]

Can Support:

656 Households

Reference:
1. Joakim Holmbom. Modelling of waves and currents in the Baltic Sea. 2011
2. Sandra Ottosson, Karin Vendt. Impact of Extreme Sea Levels and Waves. 2013
3. http://www.dmi.dk/en/hav/maalinger/tidal-tables/
4. http://wenda.google.com.hk/wenda/thread?tid=2a16a306a20e07d9
5. http://subsite.kk.dk/sitecore/content/Subsites/CityOfCopenhagen/SubsiteFrontpage/LivingInCopenhagen/ClimateAndEnvironment/CopenhagensGreenAccounts/EnergyAndCO2/Consumption.aspx