W . I . N . D . S . (Weather Intensity Normalized Dynamic System)

(1). Monocle magazine recently published the "quality of life Survey 2013", positioning the city of Copenhagen on the top of the chart, for providing the best living quality in the world...
(2). The CPH 2025 climate plan, states that the city will become carbon neutral by 2025, first city in the world.
(3). Wind contribute now to 30% of the national energy demands, and is planned to increase to 50% by 2020.

The city of Copenhagen is characterized by its longing for quality of life(1), and sustainable environment(2). Previous sustainable interventions are strongly linked to the production of attractive and vibrant public space, often resulting in public space enhancers, as a byproduct.
The act of cleaning the inner water was the trigger action for the pool in Brygge , or more recently, the waste treatment plant is coupled with a ski facility, two examples of how environmental practices influenced the social life of the city.
The new challenging goal of the city rely heavily of its realization on renewable energy exploitation, with a forecasted increase by 73%. a central role in it is reserved to wind energy.
But wind cannot be controlled , and its intensity fluctuate. On december 21th 2013, during one hour wind energy reached 135% of the national demand , 102% on a daily basis.
Given the (3) , this means a waste of 100% energy for one hour .This events will happen more and more often, in the moment that the city aim at the 100% clean energy production.
This fact rise an issue that was previously unknown... how to use this energy surplus ?

IS IT POSSIBLE TO THINK ABOUT ALTERNATIVES, THAT USE OF THE SURPLUS ENERGY IN A DIFFERENT WAY, COMBINING THE STORAGE WITH PUBLIC ACTIVITIES?

W.I.N.D.S.
Weather Intensity Normalized Dynamic System
As stated in the preconditions, the project wants to couple the environmental machines in a socially active and dynamic system.
The project doesn't aim to a perfect energy efficiency, but consider more important the implications to produce , together with clean energy, an interesting environment where social intercourses can take place.
The inflatable structure will result in an artificial landscape, a surface that will fluctuate between different statuses , following the weather rhythm, linking energy production to social activities.

Environmental impact

W.I.N.D.S. doesn't produce new energy, but recycle the share of it that will be otherwise wasted.
The maximum volume of compressed air is 32.000 m3 . the working pressure of a balloon system is usually between 20 and 70 Atm. The layer of soil that cover the balloon itself will help balancing the pressure, in a similar way to the water pressure that is used for the underwater system.
The material used is a Vectran® fiber, widely implemented in the experiments by Thin Red Line Aerospace in their CAES infrastructures, for its strength weather resistance and hight temperature stability. Considering a safe pressure around 15-20 bar and an average production of 1,3 Kwh\m3, the maximum energy produced during one cycle amount to 41.600 Kwh, needing for the inflation process 55.400Kwh (efficiency 75%) . Referring to the production of Middelgrunden Plant, that with an average hour production of 10.000 kw, the system will be able to absorb a 4 hour of operational surplus, or contribute to 1,6% to the energy bill of the city of Copenhagen (compared to the 4% of Middelgrunden). On the side, the thermal energy produced, could be inserted in the heating network to contribute to the public heating.