Accelerated by onshore, offshore and sideshore winds the PACIFIC POWER PALMS are able to convert the slightest breeze into electric energy. Situated a quarter mile in front of the pacific coastline there will be enough wind to harvest – at least you could ask any Santa Monica surfer about that.
Caused in general by the atmospheric circulation and the diurnal wind changes in coastal areas plus the unique phenomenon of the Santa Ana winds the potential wind energy is a very suitable force to work with. With average wind speeds of 6,0 – 6,5 meters per second at the rotor blades in about 15 - 30 meters altitude, there will be approximately 125 Gigawatt-Hours per year of energy to harvest from the 30 Power Palms. Enough energy to provide roundabout 3,500 average households with renewable electricity or to produce approximately 3.3 Million gallons of drinking water with electrodialysis of seawater.
The tower construction of a power palm is similar to a conventional offshore wind power plant and either made out of concrete or allumi-nium prefabs or both. The upper part is built of a nacelle with an electric generator on the inside, propelled by five independent segments rotaring on a vertical axis and 4 leaves i.e. rotor blades per segment. The leaves are made of lightweight composite materials likewise to common rotor blades due to weight and flexibility requirements. And like regular wind power rotor blades every single leave also has a pitch control. But other then regular the pitch is needed to adjust the angle constantly within a 360° rotation of every segment. The leaves must be in a vertical position for collecting the wind energy when they are getting in the wind direction and in a horizontal position when they are turning against the wind direction so that they have most minimal windage and do not decelarate the movement.