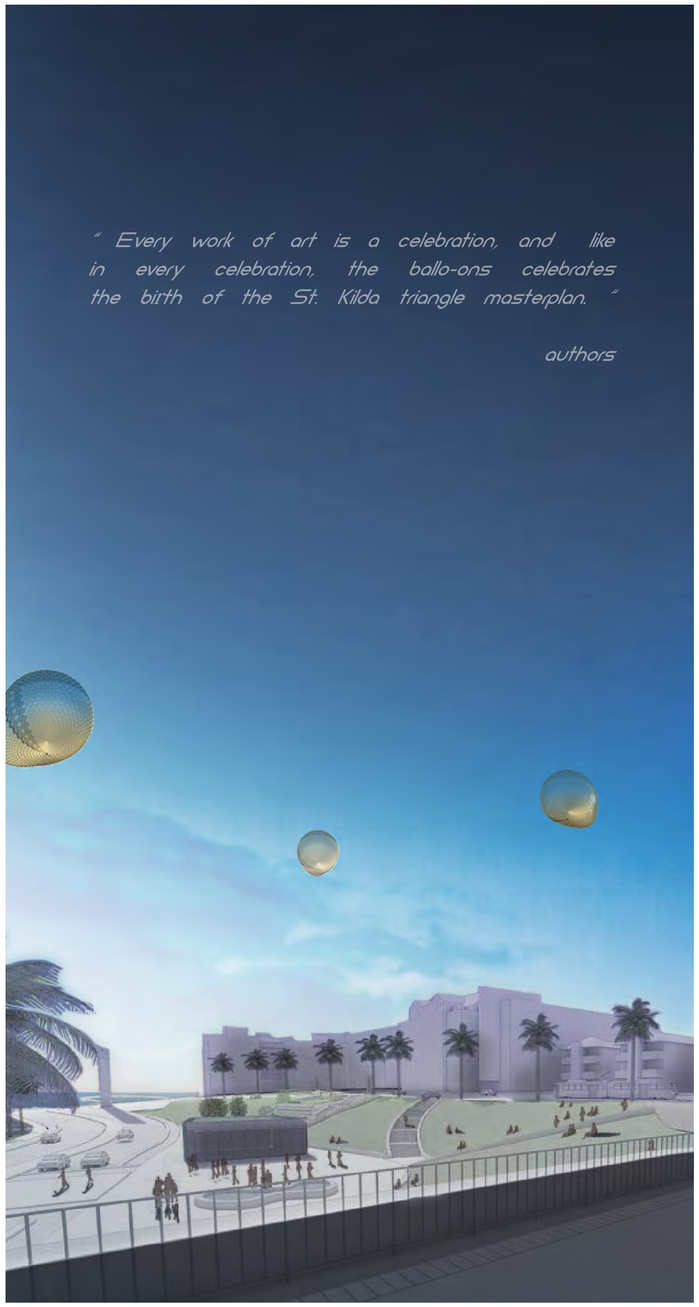
View from the remoulded Slopes looking south

Technology

A Buoyant Airborne Turbine (BAT) is a flying aerostat that has a horizontal axis wind turbine within its shell and can elevate up to 600m. Pioneered in 2010 by the Massachusetts Institute of Technology and Altaeros this technology aims to harness the abundant energy in strong, steady winds at higher altitudes.

A almost ring shaped aerostat with two wind turbine installed in its interior (as in Fig. 8c). The whole generator is lighter than the air, so the take-off and landing maneuvers are simplified, and the only remaining issue is the stabilization of the generator in the right position relative to the wind 6. The aerostat is aerodynamically shaped so that the absolute wind generates lift that helps keeping a high angle of altitude together with the buoyancy force.

The hybrid technology of wind-solar responds to the identification of Melbournes optimum climatic values (Diagram 1). This means that there is a high possibility of sun capturing when there is a low average wind speed and the other way around (high wind capturing when low sunny days.



View from the new balcony looking north

Wind energy estimation :

Calculating on line concepts of Wind data (wind speed, height above ground) Parameter (Roughness length, shape parameter) and Rotor area exposed to the wind, we obtained the following results depending on the type of balloon:

Ballo - on size	Rotor area	Height above ground	Theoretical Annual Power Output* [kW]	Subtotal
Primary boundary ballo-on	4 Ø (dometer)	100 mts	12 692 [kW]	12 692 [kW]
Primary and secondary boundary ballo-ons (2)	2 Ø	20 mts	2143 [kW] * 2	4286 [kW]
Secondary boundary ballo-ons (7)	1 Ø	20 mts	1071 [kW] * 7	7497 [kW]

SubTotal: 24 475 [kW]

View at night of the Palais Forecourt and Theater

Solar energy estimation :

Based on traditional solar energy calculation 8 to get a rough estimate. Power is proportional to the area of the scales multiplied by reference parameter [kW] and multiplied by the annual average sun hours, we obtain the following results:

Ballo - on size	Area		[kW]		Annual average sun hours	Subtotal
Primary boundary ballo-on	6,22 m2	=	0.942	*	2294	2 160 [kW]
Primary and secondary boundary ballo-ons (2)	2 Ø	=	0.47	*	2294 * 2	2 156 [kW]
Secondary boundary ballo-ons (7)	1 Ø	=	0.2358	*	2294 * 7	16 058 [kW]

Subtotal: 20 374 [kW]

Total: 44 849 [kW]