SOLAR TREE

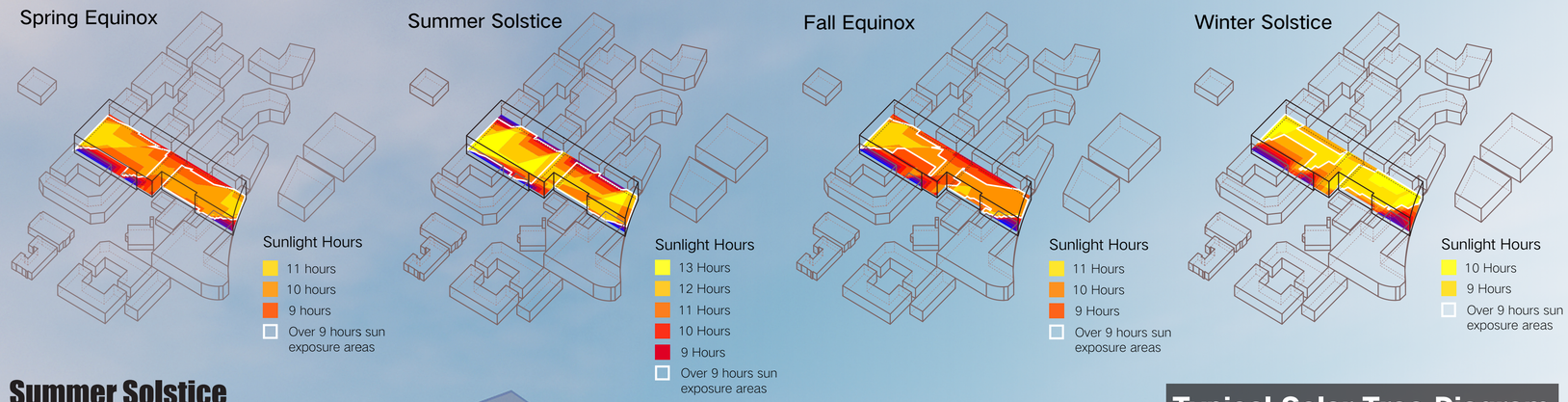
Reflection on lives and Creation of dynamic life

The solar tree situates in a linear park beside the light rail that transits to and from downtown Abu Dhabi. As the light rail passing by, residents and tourists on it will catch a glimpse of the solar tree beside and start to wonder what the magnificent tree-like artworks are. That short glimpse intrigues passengers curiosity and desire to explore that area and then the location becomes part of their journey in the country.

The ClearView Power™ technology makes the combination of land art and energy generators possible. The solar cell selectively transmits light visible to the human eye while absorbing only the ultraviolet and infrared light and converting it into electricity. One square metre transparent solar coating can generate 50 Watts of power per hour under full sun exposure. The transparency of solar panels provides great potential to add aesthetic value.

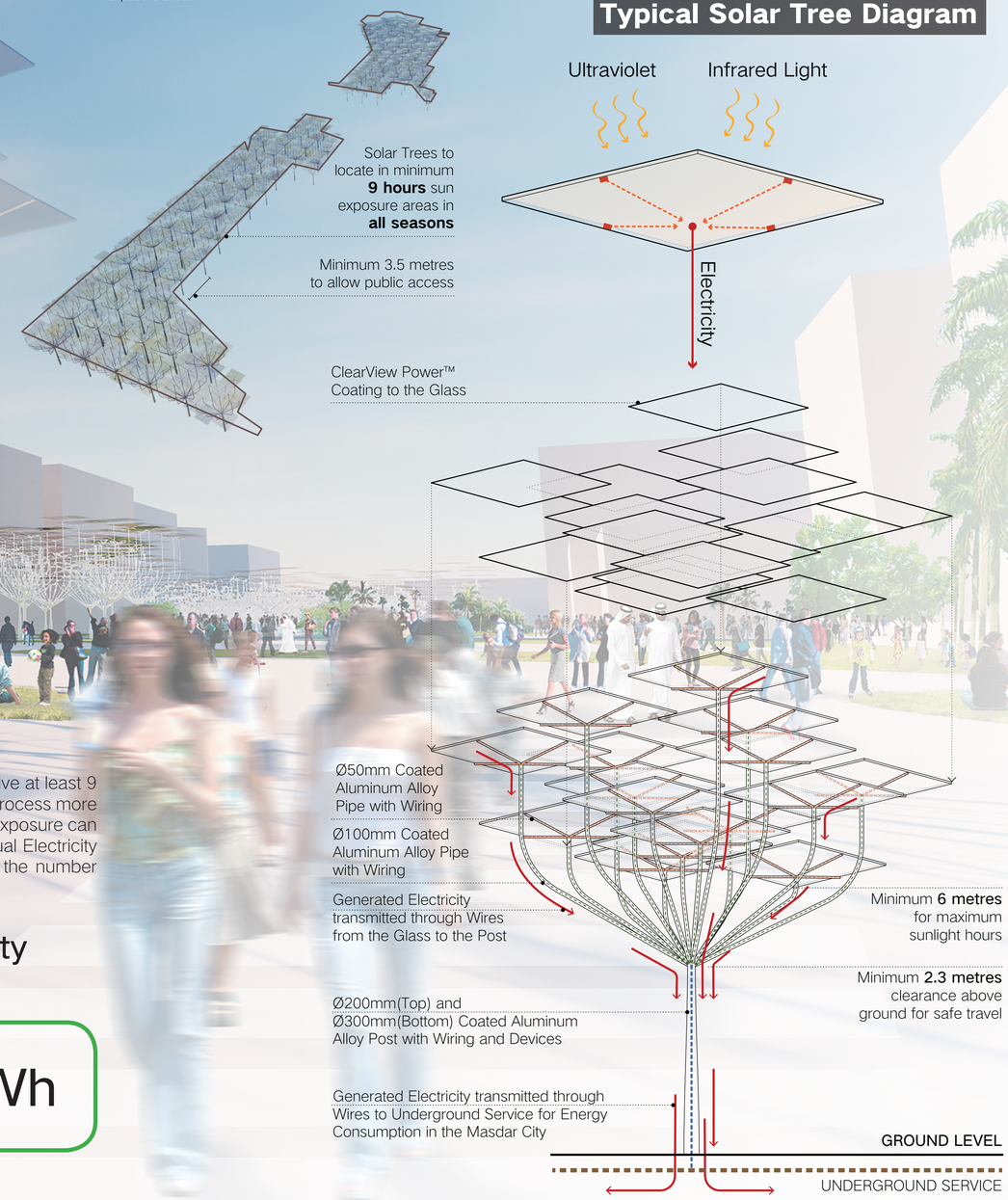
Just like oxygen transferred from tree leaves, converted into energy to tree branches and continuously travel through the tree trucks to the roots, the 1617 solar glass panels on top collect the invisible ultraviolet and infrared light from the Sun and convert them into electricity, then transfer down to the underground service for daily energy consumptions in the Masdar City. A thin layer of ClearView™ Power glass coating deposited directly onto the glass panels on top of the solar tree makes the conversion possible. The solar tree branches and trucks are made of coated aluminum alloy pipe with electrical wiring transferring the energy to underground service during the day.

Solar Exposure Hours 6 Metres above the Ground



Summer Solstice 2pm

Typical Solar Tree Diagram



Minimum Electricity Generation Capacity

One Solar Glass Panel

10.8 m^2
Areas of One Solar Glass Panel

0.05 kWp
Peak Output Measured in 1m^2 Transparent Solar Coating

9 Hours
Daily Minimum Full Sun Exposure Hours

1774 kWh
Annual Electricity Produced (Calculated for 365 days)

X

Total Number of Solar Glass Panel

1617

=

Minimum Annual Electricity Generation Capacity*

2868.56 X 10^3 kWh

*Minimum Annual Electricity Generation Capacity:

All the solar glass panels are fixed at least 6 meters above the ground and within the areas which receive at least 9 hours full sun exposure. This means higher transparent solar panels can get longer sunlight hours and process more electricity annually. In addition, those panels within the areas that receive more than 9 hours of sunlight exposure can generate more electricity. The minimum of 9 hours of sunlight hours is used in the calculation of Annual Electricity Generation Capacity. Therefore, the actual annual electricity generation capacity will be higher than the number calculated.