arabic-UP

*It all starts with air particles spread through the dessert.*

*When the sun hits them, they begin to move.*

*Not only to move but to draw. Arabesque.*

*Not only to draw but to ascend.*

*Their journey gives shape to the tower and establishes a link between this land's*

*history and future.*

Updraft towers are on the verge of becoming a widespread method for energy generation. Prototypes have met increasing interest and the expectations for seeing a full-scale, fully operative tower are rising.

The use of this novel technology goes hand in hand with Masdar’s decision ‘to advance smart design and technology’ and to become ‘one of the world’s most sustainable urban communities’.

With approximately 8 thousand square meters of energy collection and an overall efficiency of 12%, the tower is able to generate 1 Megawatt hour.

The arabesque that forms the tower extends through all the site. In the center it curves to make way for the street and to provide suitable conditions for a public space. The warm air circulates in a layer just below the roof and the ground level remains cool. Human comfort is further improved by the turbulence generated by the air flow.

The landscape is created by distributing underground caves that mimic the ancient tombs found in Jebel Hafeet, after which the earliest human settlements in UAE’s territory are named.

These tombs were constructed approximately five thousand years ago and are a testimony of trading relationships with Mesopotamia and the Indus Valley. They take advantage of the soil temperature and the thick walls to defend from the heat. In line with this, the caves in the project are excavated six meters below the ground level, where the temperature is on average 10 degrees cooler. Caves vary on size and shape to provide different spaces for exhibitions, recreation, restaurants and the necessary equipment for energy generation. They protrude over the ground level to generate a playful environment.

At the ground level, the different dimensions of the project intersect. Past and future. Tradition and technology. Earth and sky. The design seeks to emphasize these connections through the presence, in this layer, of all the different building components.

Looking up through the transparent roof in the main cave it is possible to appreciate the chimney, the turbines and the arabesque vanishing into the sky. In this way the public can have an exciting experience and at the same time gain awareness about the energy generation process.

We estimated the cost of the tower for each different component and its main material or task, with estimates from Abu Dhabi. The cost per watt is around 19 USD.

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| --- | --- | --- | --- | --- | --- |
| Section | Element | Unit | Quantity | Unit Cost | Cost (thousands) |
| Main layer | Reinforced concrete | Tn | 17500 | 200 | 3500 |
| Second layer | Steel | Tn | 5000 | 900 | 4500 |
| Panels | m² | 5000 | 500 | 2500 |
| Columns | Reinforced concrete | Tn | 1500 | 200 | 300 |
| Ground level | Tiles & Tiling | m² | 16000 | 33 | 528 |
| Caves | Excavation & Disposal | m³ | 245000 | 7 | 1715 |
| Stones | m² | 45000 | 45 | 2025 |
| Blockwork | m² | 45000 | 25 | 1125 |
| Power generation | Equipment |  |  |  | 400 |
| Other | Other Labour Costs | HH | 200,000 | 10 | 2000 |
|  | Unclassified costs |  |  |  | 500 |
| TOTAL |  |  |  |  | 19093 |