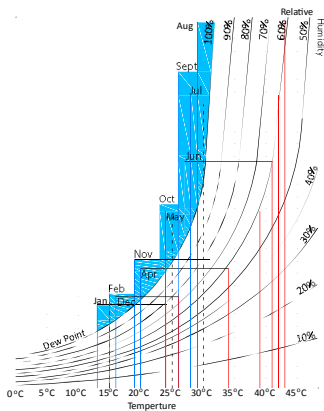


## Abu Dhabi weather

### Hot and Humid

The climate of the UAE is subtropical-arid with hot summers and warm winters. The climate is categorized as desert climate with average maximum temperatures that reach above 45 °C during the summer months. Due to its coastal location and the Persian Gulf southeastern wind known as Sharq, average relative humidity reaches 70%. A common characteristic of the desert climate is the sharp temperature oscillation between daytime and nighttime, up to 15° C. Combined with high relative humidity, the drop of temperature causes water vapor to condense to form liquid water, resulting in a thick mist that frequently engulfs Abu Dhabi.



## Coastal Fog

### Dew point Abu Dhabi

The diagram indicates the average monthly max / min temperature in relation to the average monthly relative humidity. As the temperatures drop while the relative humidity remains constant, the air reaches the dew point and condensation accrues creating fog.



## Masdar City

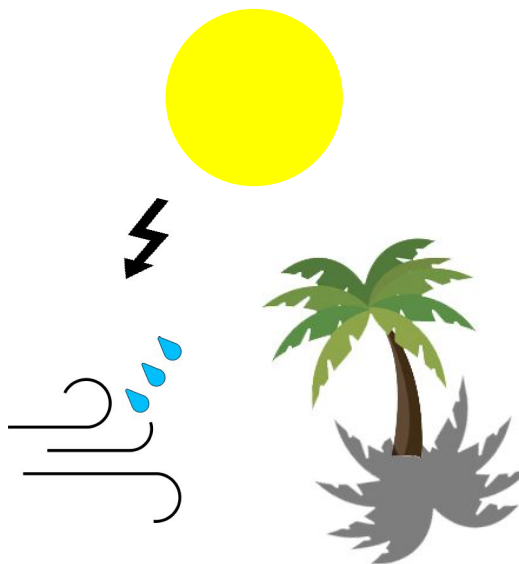
### Urban thoroughfares

Masdar city master plan is dissected by 2 continuous urban corridors indicated as green pedestrian thoroughfares. Considering Abu Dhabi's arid conditions, sustaining vegetation on an urban scale demands significant water resources, which amount to high energy demands. Moreover, movement and activities in such climatic conditions requires intensive architectural attention so as to ensure sufficient comfort to the inhabitants of the new city and provide them with sustainable high quality urbanism. The completion site is located at the gateway to the new city en route to its urban public center. In order to follow through with the urban vision a sustainable water supply strategy must be considered.

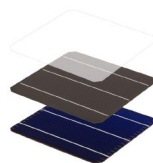


## Nexus Leaf

The Nexus Leaf serves as a hub for energy and water generation that uses the natural environment in a sustainable way to support the local community



### Energy Harvesting Tandem Approach



The bottom layer is a regular silicon solar panel, which captures the longer wavelengths of light, whereas the top layer is made of perovskite, which captures the shorter wavelengths of light, and allows the longer wavelengths to pass through. In that way, the panels utilize a broader part of the spectrum, and can reach a higher efficiency than regular commercial solar panels – about 30% efficiency, compared to 18% efficiency for regular commercial panels.

### Extracting water from air

#### Active condensation



Atmospheric water generator is a device that extracts water from humid ambient air. Water vapor in the air can be extracted by condensation - cooling the air below its dew point. Air is passed over a cooled coil, causing water to condense. The rate of water production depends on the ambient temperature, humidity, the volume of air passing over the coil, and the machine's capacity to cool the coil.

#### Passive condensation

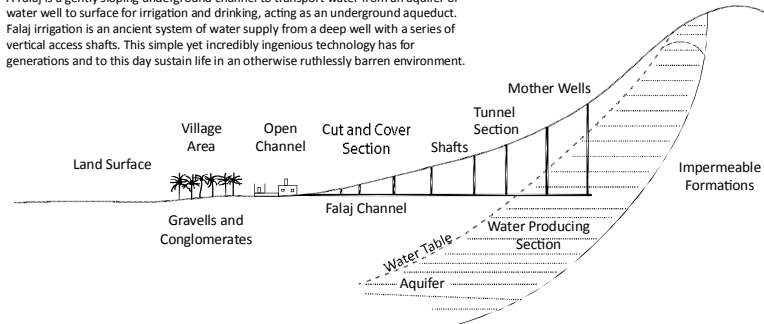


Through a process known as condensation, atmospheric water vapor from the air naturally condenses on cold surfaces into droplets of liquid water known as dew. The phenomenon is most observable on thin, flat, exposed objects including plant leaves and blades of grass.

## Falaj Technology

### UAE's traditional irrigation system

A Falaj is a gently sloping underground channel to transport water from an aquifer or water well to surface for irrigation and drinking, acting as an underground aqueduct. Falaj irrigation is an ancient system of water supply from a deep well with a series of vertical access shafts. This simple yet incredibly ingenious technology has for generations and to this day sustain life in an otherwise ruthlessly barren environment.



## Al Ain Oasis

### The source of life

Al Ain which means 'spring' in Arabic is an oasis that dates back 4,000 years ago to the region's inhabitants who began taming the desert and has been an essential source of livelihood for generations. The site is shaped by a complex shared water supply, based on both wells and falaj, with an extensive system of shaded pathways that wind through some 147,000 date palms. The flow of cool water coupled with the generous shade cast by the dense canopies generates a unique microclimate. In the context of the harsh desert sun, the oasis is like a scene straight out of a fairy-tale, well worthy of its stature as a UNESCO World Heritage site.

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