

SOLAR THERMAL COLLECTORS

Concentrated heat from the sun heats water to run a type of air conditioner called an absorption chiller. Thermal collectors lower electricity demand and cost less than photovoltaics.

THERMAL STORAGE

Heat can be stored in insulated containers for use after the sun goes down.

IRRIGATION WATER

What little rain falls on the city will be combined with irrigation to water vegetables and other plants. The water will be recycled.

MASDAR HQ

The Masdar Initiative's headquarters will illustrate many of the strategies used throughout the city to increase efficiency and harvest energy from the sun. The design's most salient feature, the wind cone, was inspired by wind towers built into traditional Middle Eastern houses. Designed with the help of detailed simulations and wind tunnel tests, the cones will help cool the building and provide natural lighting.

SOLAR SHADING

Translucent insulation, made from nanoscale silica that absorbs heat but allows light to pass through, is being considered for the outer walls.

SOLAR PHOTOVOLTAICS

Solar panels angled 20° toward the sun both shade the building and generate electricity.

GRAYWATER

Saving water saves energy, since fresh water will come from energy-intensive desalination. Water from sinks and showers is recycled.

WIND CONE

Hot air rising inside the building speeds up as the cone narrows, drawing in cool air from under the building and reducing the load on air conditioners. Wind blowing over the top of the cone also promotes ventilation.

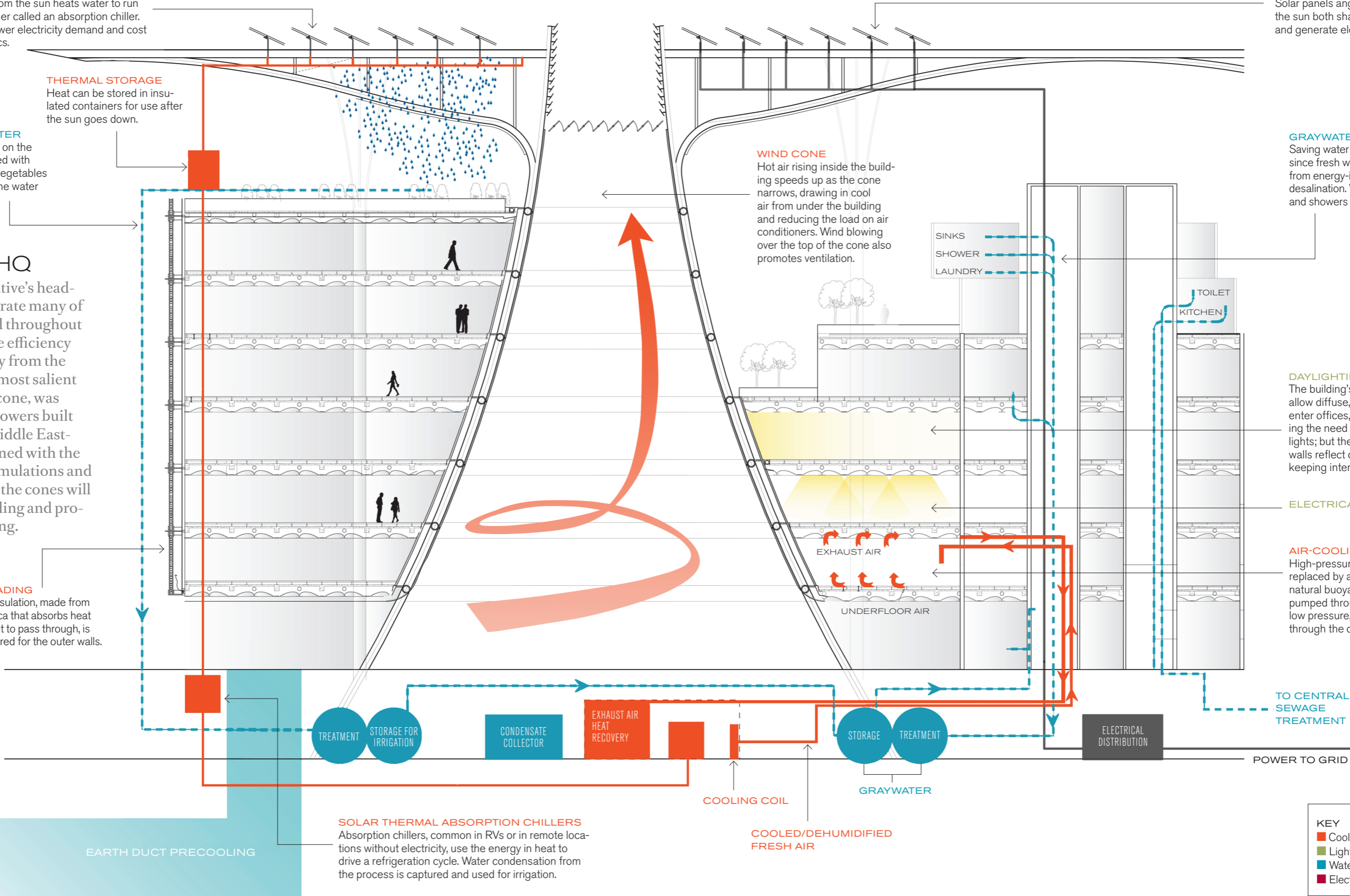
DAYLIGHTING

The building's 11 wind cones allow diffuse, indirect light to enter offices, greatly reducing the need for electric lights; but the cones' angled walls reflect direct light away, keeping interiors cool.

ELECTRICAL LIGHTING

AIR-COOLING SYSTEM

High-pressure blowers are replaced by a system that uses the natural buoyancy of air. Cool air is pumped through a raised floor at low pressure, and warmer air exits through the ceiling.



SOLAR THERMAL ABSORPTION CHILLERS
Absorption chillers, common in RVs or in remote locations without electricity, use the energy in heat to drive a refrigeration cycle. Water condensation from the process is captured and used for irrigation.

KEY

- Cooling
- Lighting
- Water
- Electricity