

Masdar city, U.A.E.

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Sustainability city

Overview

- Sustainability
- Principles of sustainability
- Introduction to Masdar city
- Land use plan
- Design and plan
- Energy management
- Water management
- Transportation
- Construction
- Conclusion



Location



Sustainability.... Capacity to endure

- Biological systems
- Refers to the development without effecting future generations
- A eco-city: enviromental impact, inhabited by people dedicated to minimization of required inputs of energy, water and food

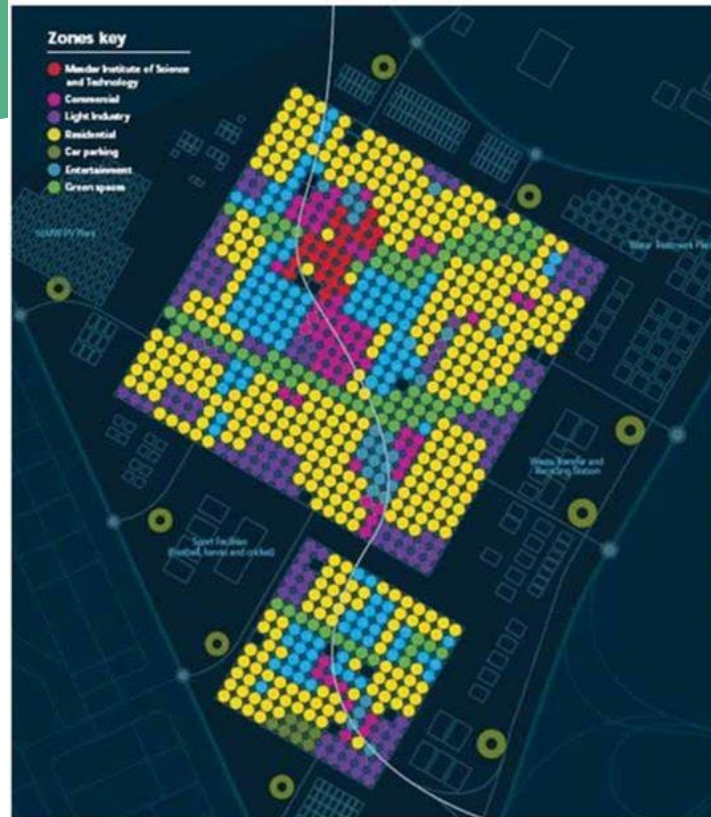
Sustainable principles

- **Zero carbon**
- **Zero waste**
- **Sustainable transport**
- **Local and sustainable materials**
- **Local and sustainable food**
- **Sustainable water**
- **Natural habitats and wildlife**
- **Culture and heiritage**
- **Equity and fair trade**
- **Helth and happines**

Masdar (the source)

- Masdar city is an arcology project in Abu Dhabi
- By Masdar (Abu Dhabi future energy company) completed by 2030
- Designed by Foster and Partners, solar energy and other renewable energy sources with a zero waste ecology
- The city is designed to be a hub for cleantech companies

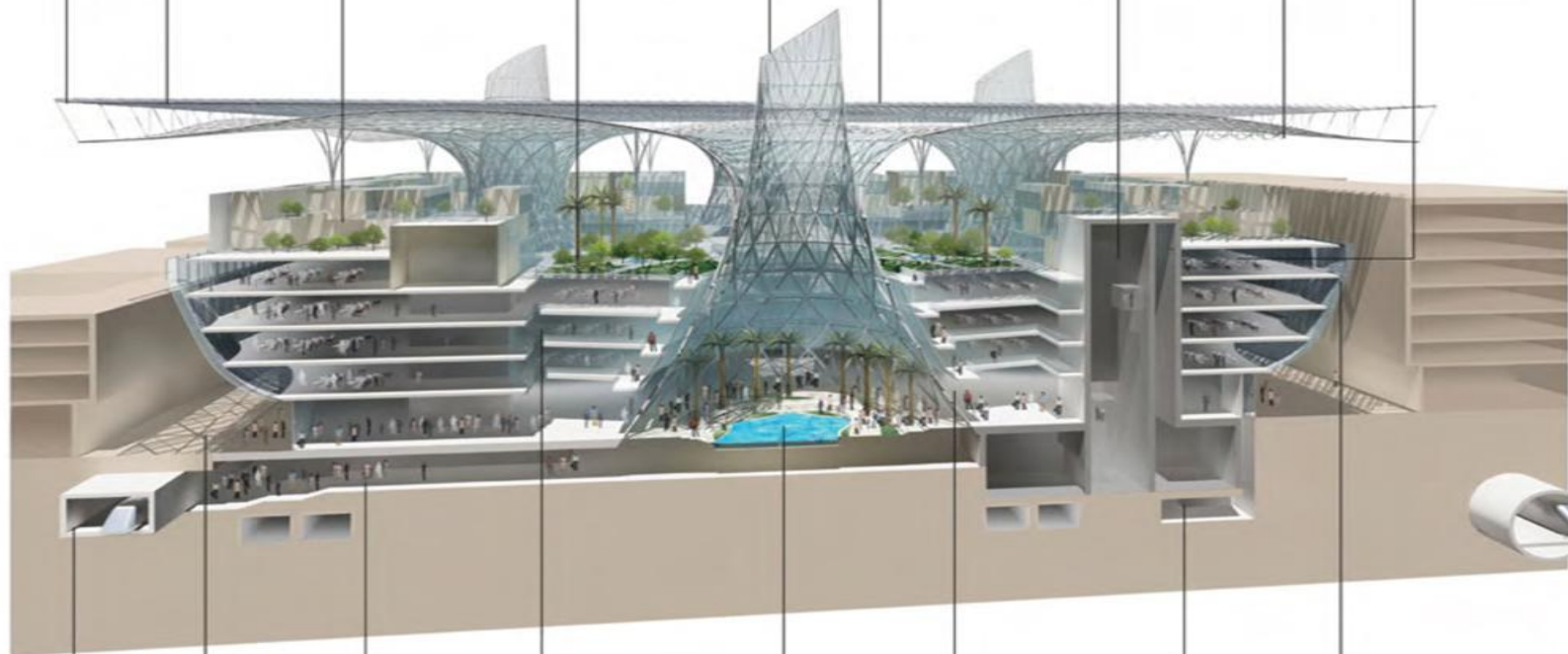
Land use plan



Design and plan

- Environmental gains: the cities (and buildings) orientation (with regards to the sun and prevailing winds) and its form
- Building performance optimisation.
- Active control such as renewable energy, are the most expensive while offering the lowest relative environment impact returns.

Open Shading Roof Photovoltaic Panels Residential Units Shaded Roof Garden Wind Cone Solar Thermal Collector Elevator Wind Turbines Integrated Workstation



Persoanl Rapid Transportation Shaded Ground Street Underground Pedestrian Connection Headquarter Office Space Garden Courtyard Ground Lobby/ Retail Space Earth Thermal Ducts High-Performance Glass Sphere Wall MRT

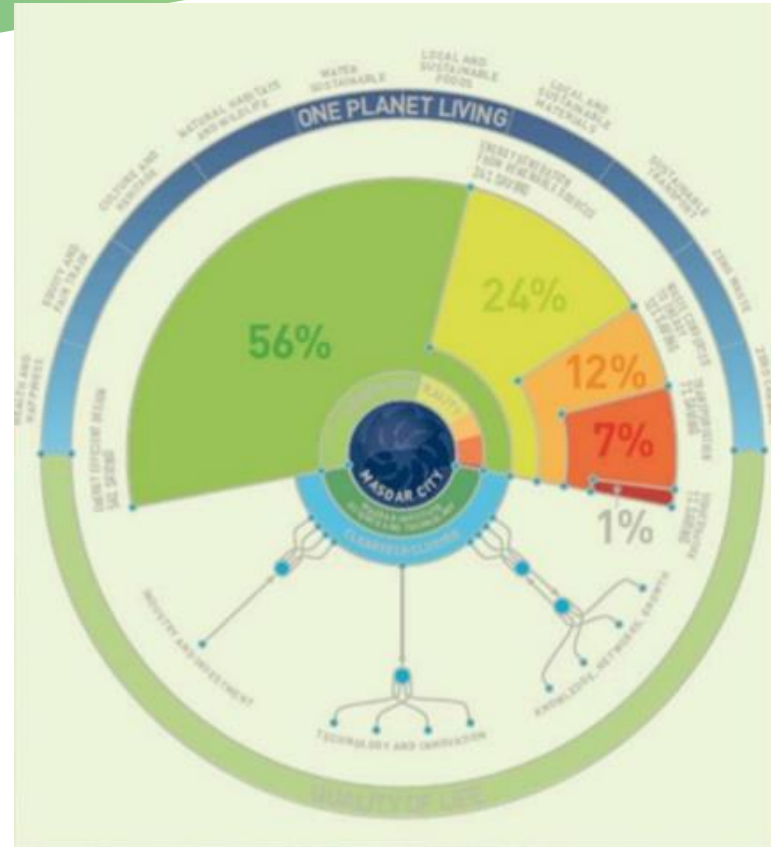
Energy management

Minimises energy:

- Low energy lighting specifications
- The percentage of glazing
- Optimizing natural light
- Installing smart appliances:
building management systems
- A citywide energy management
system, from the utility to the
consumer

Savings

- 100% powered by renewable energy
- 170MW photovoltaics
- 30KW per capita per day energy use
- (9x less than USA)



Water management

- Water needs are less than Abu Dhabi.
- Not include water required for district cooling.
- Highly efficient fittings, fixtures and appliances.
- Desalinate groundwater with solar energy.

Transportation

Masdar city is piloting

- Pedestrian focused community
- sustainable transportation
- A personal rapid transit (PRT)
- A freight/light rapid transit (FRT/LRT)

Masdar city also has initiated an electric car pilot with Mitsubishi Heavy Industries to test a point to point transportation solution for the city that uses Mitsubishi Motor's



Personal Rapid Transit (PRT)

PRT Fast Facts

PRT Vehicles:	3,000
PRT Stations:	85-100
FRT Vehicles	810
PRT Trips per day:	135,000
Max. Walking Distance to PRT Station:	150m
LRT Trips per hour:	5,000 people

Construction material

- Green concrete, ground granulated blasted slag to replace cement
- Water-based paints
- Reinforcing bars made of 100% recycled steel

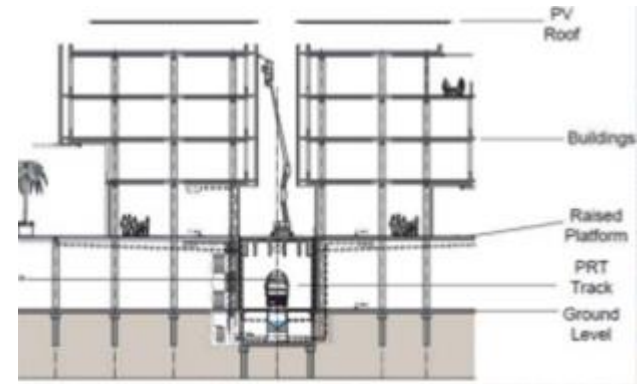
The houses and shops have thick walls made of dried coral and gypsum that absorb heat during the day, releasing it slowly at night.



- 100% sustainably sourced timber
- 90% recycled-content aluminium used for the inner facade

Conclusion

- In order to be Sustainable, it should also justify itself financially
- “Disneyland is attractive because all the service is below ground. We do the same here - it is literally a walled city. traditional cars are stopped at the edges”



- Energy from the sun. Just 20 percent as much power as a conventional city of similar size.
- International companies, academics and researchers and marketers.
- 1,500 cleantech businesses, ranging from large international corporations.

