A low-angle photograph of a large array of solar panels, likely heliostats, mounted on a structure. The panels are dark and reflective, with some showing a grid pattern. The sun is visible in the upper left, creating a bright flare and illuminating the scene. The background is a clear blue sky.

Thermodynamic Solar Energy

Solar Middle East 2017

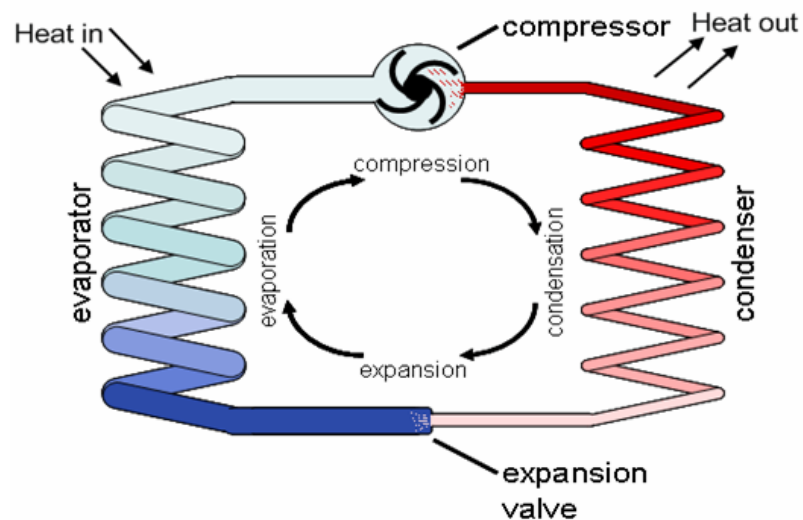
Introduction

- ▶ Thermodynamics
- ▶ Existing renewable Energy solutions for DHW
- ▶ Limitations of Existing solutions
- ▶ What is Thermodynamic Solar Energy
- ▶ How this technology can overcome those limitations

Thermodynamics

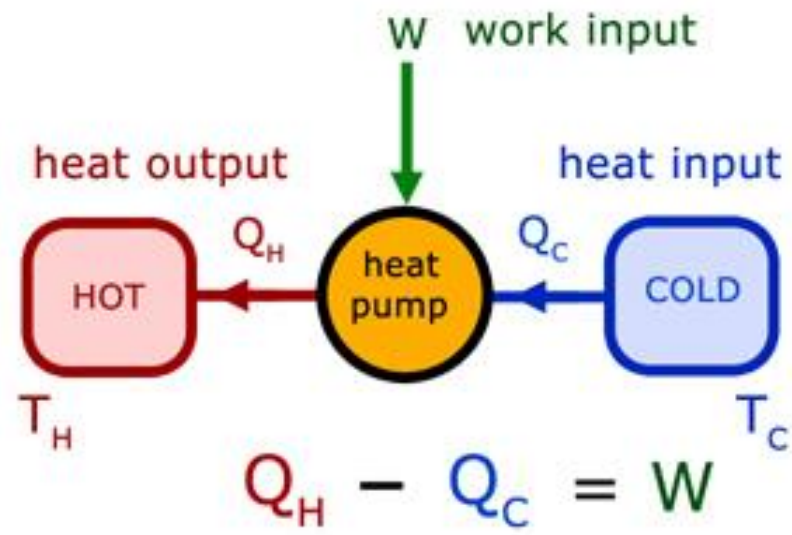
- ▶ *Thermodynamics is the study of the effects of Work, Heat and Energy on a system.*

NASA



DHW Heat Pumps

- ▶ For Domestic Hot Water, Thermodynamics were first applied to create Heat Pumps



DHW Heat Pumps

- ▶ Heat Pumps have limitations in the UAE:
 - ▶ High temperature input limit
 - ▶ Can't capture the Sun Radiance
 - ▶ Although performed, still have a considerable electrical consumption
 - ▶ Corrosion

Solar Water Heaters

- ▶ Solar water heating was known as the conversion of sunlight into heat for water heating using a solar thermal collector.



Solar Water Heaters

- ▶ Solar Thermal systems have limitations that cannot be overcome, specially in the UAE:
 - ▶ Limited operation time
 - ▶ Overheating
 - ▶ Corrosion
 - ▶ Sand Storm related Problems
 - ▶ Space

UAE's Vision



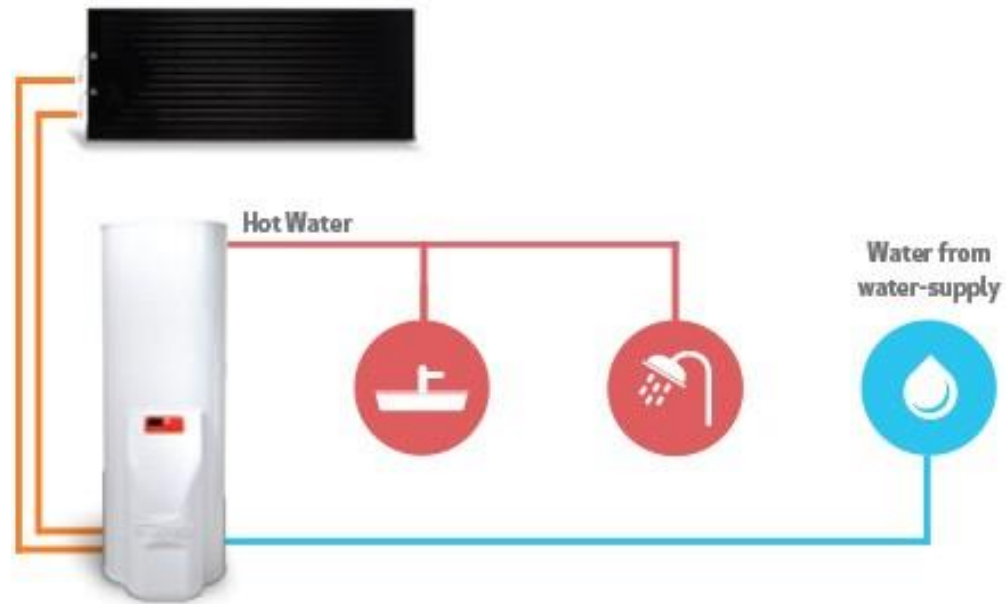
- ▶ *The UAE Government wants to ensure sustainable development while preserving the environment*

in www.vision2021.ae

- ▶ Measures are being implemented to increase the share of Clean Energy Contribution to reach the 27% target by 2021

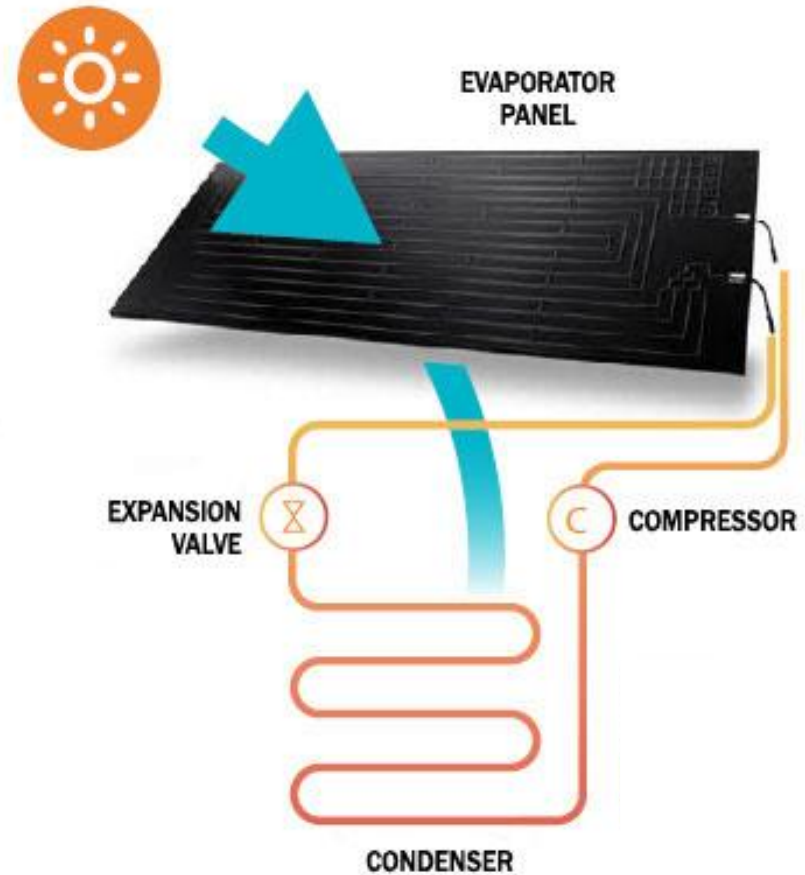
Thermodynamic Solar Energy

- ▶ Combination of 2 incomplete technologies
 - ▶ Solar Thermal systems
 - ▶ Heat Pumps



Thermodynamic Solar Energy

► Working Principle



Thermodynamic Solar Energy

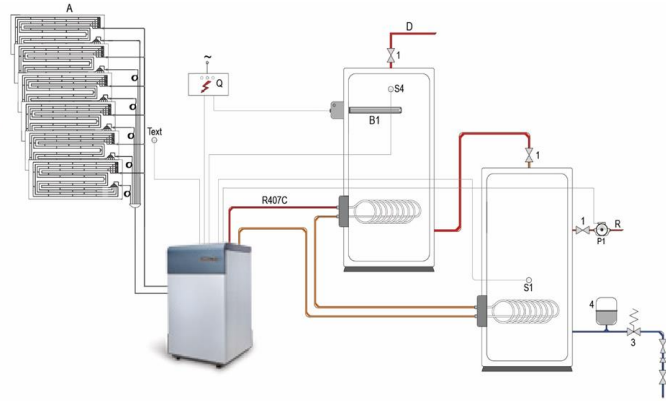
▶ Solar Collector

- ▶ Black Aluminium Panel with a special coating
- ▶ No Overheating
- ▶ No Sand Storm related Problems
- ▶ Very Low consumption
- ▶ Light-weight
- ▶ Flexible installation
- ▶ Higher Efficiency and Life Expectancy



Thermodynamic Solar Energy

- ▶ It can be applied to Domestic use or Hospitality/Industry use
 - ▶ 1 Villa typically uses only 1 panel
 - ▶ Hospitality/Industry typically uses up to 160 panels



- ▶ These solutions reduces panel surface, storage capacity and electrical consumption to do the same output

Thermodynamic Solar Energy

- ▶ Main Advantages
 - ▶ More Performance
 - ▶ Less Consumption
 - ▶ No Constrains
 - ▶ Overheating
 - ▶ Corrosion
 - ▶ Weather conditions
 - ▶ Space





Thermodynamic Solar Energy

▶ Conclusion

- ▶ UAE needs products which adapt to its specific features
- ▶ Thermodynamic Solar Energy solutions are a perfect fit in the UAE.



Thermodynamic Solar Energy

Thank you for your interest

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