

New Thermal Storage Technologies - WERC / UniSA

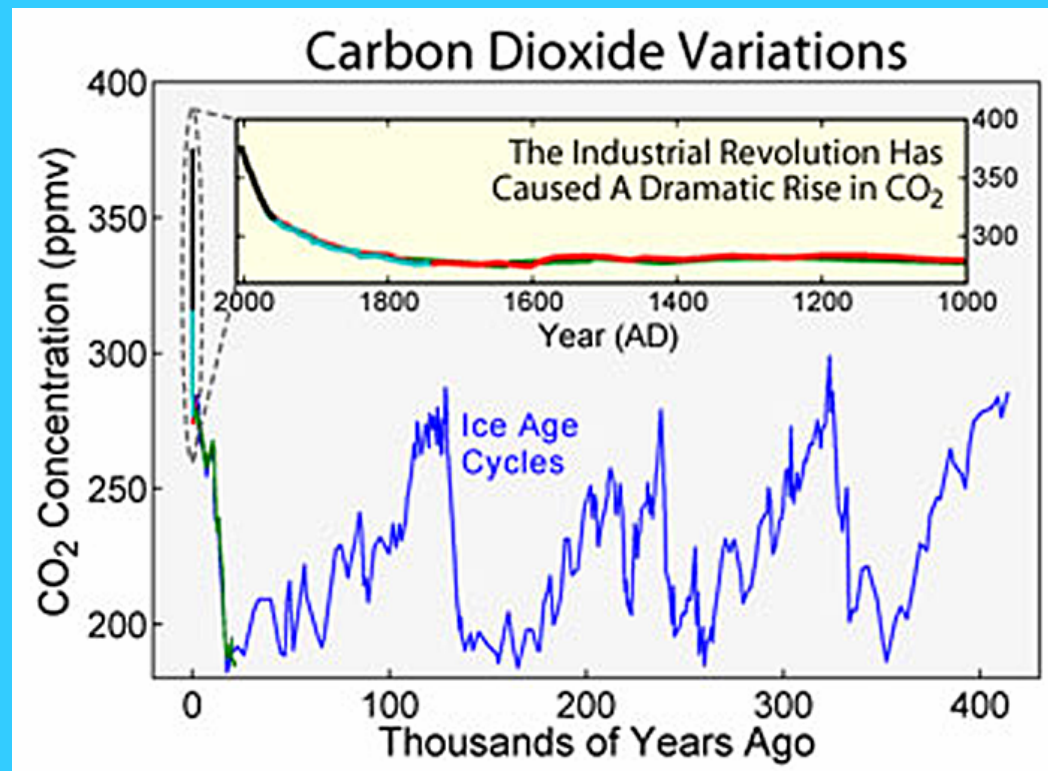
Implications for:

- medium density scaled buildings
- air-conditioning
- hot water systems

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Reality

Time is not on our side.





“If you always see how
you’ ve always seen,
You’ ll always be who you’ ve
always been.”

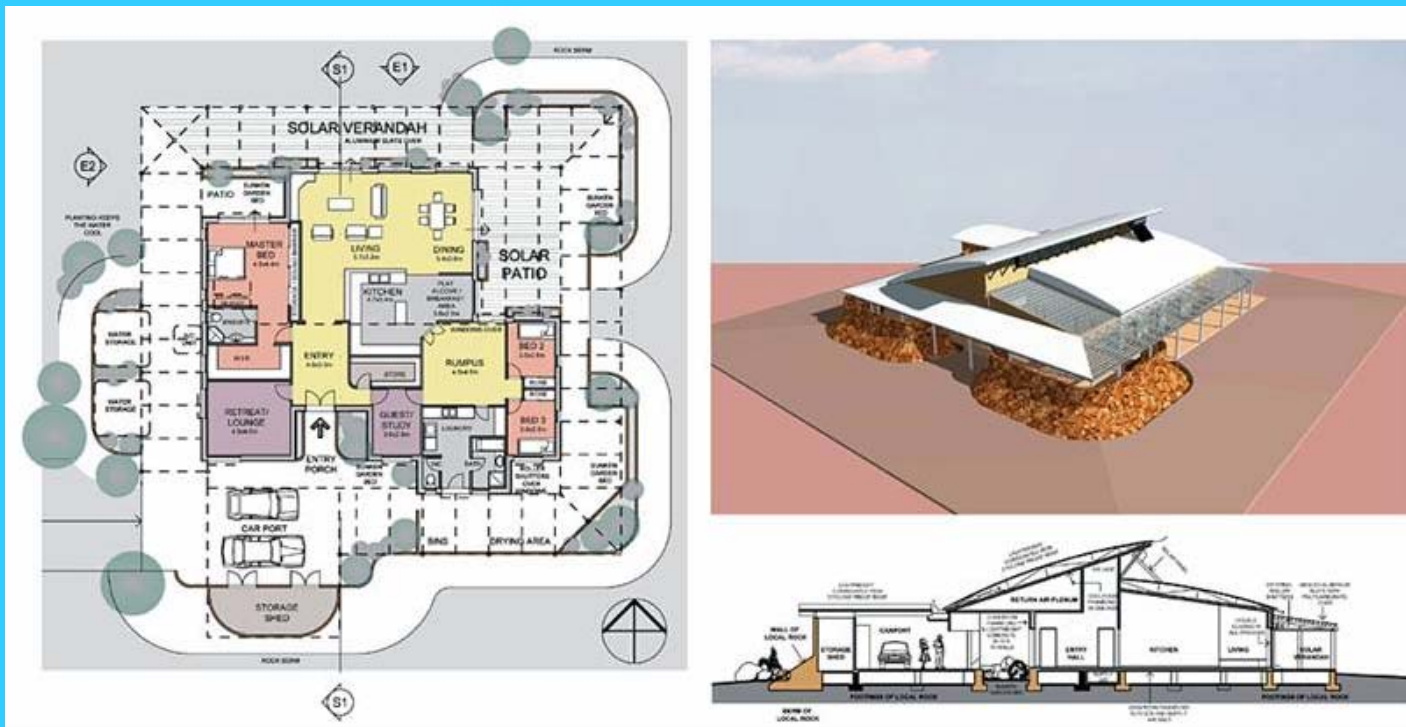
HOUSING

Over 8,000,000 dwellings in Australia

Built average 150,000 – 180,000 pa

USE THERMAL INERTIA STORAGE?

- Understanding passive solar housing
 - Thermal mass a critical element



“the Millennium Home concept”



Residential Solution - A Mass Structure



“the Eco-Compound”

PHYSICS of all Solar technologies

4 MAIN PRINCIPLES

- COLLECTION
- **STORAGE**
- DISTRIBUTION
- CONTROL

THERMAL INERTIA FACTS

- Heavy weight materials in walls and floors

**1400 to 2040 kJ/m³K
(100 kWh/day per house)**

- Water for storing direct or indirect thermal energy

**4200 kJ/m³K
(12 kWh /300 litre water tank)**

BATTERY STORAGE

The new frontier is to align day-time solar collection with night-time use?

Disruptive – perhaps?

Maybe a little more lateral thinking is needed?

ESPECIALLY THERMAL APPLICATIONS

Average value per kWh over 12 years (Life Cycle Cost)

33 c/kWh

(Analysis by Josh Byrne and Assoc)

LIFE CYCLE - Critical realities:

Mass scale batteries eventually	15 c/kWh
PV system	10 c/kWh
Off Peak power	13.5 c/kWh
Conventional AC	12 c/kWh
Gas Storage hot water	36 c/kWh
SHWs gas boosted	18 c/kWh

Capital/repairs: \$/peak kW for 30 years

\$2,000 to \$3000/kW of cooling power

Over 60 years: \$4,000 – \$6,000/kW

'MassLinc' TEC System

•Mass over 30 years: \$1,000/kW

•BUT! Over 60 yrs ONLY \$1,200/kW

Which equates to:

2 - 4 c/kWhover 30 years

1 - 2 c/kWhover 60 years!

- **‘SOLATANK’ new indirect storage technology by WERC**
- **PV driven technology using mains pressure heat exchanger**
- **Total system cost:**
 - 2 - 3 c/kWh over a 60 year period**
 - 5 - 6 c/kWh over a 20 year period**

- **Commercialization**
- **Capital raising/industry partners** now needed
- **Demonstration**
 - Firstly for SolaTank then MassLinc program planned with UniSA for various climates
 - Integration into the SVT Development



HELIOS - SVT Project

