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Sustainable Technologies in the Australian Green Building Sector

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Overview

- **The green building journey so far**
- **2010 - a milestone year**
- **Beyond Carbon Neutral**

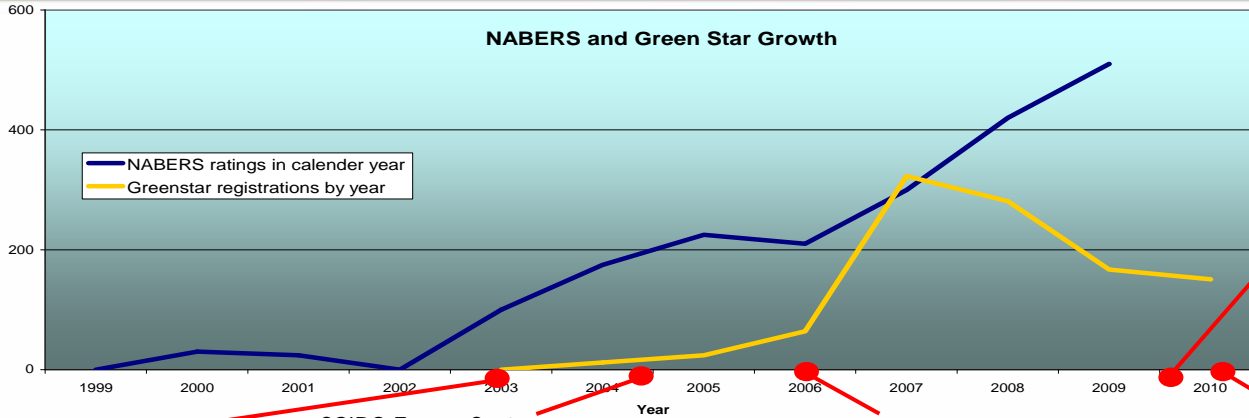
More than just buildings – the rise of the intelligent grid

- Intelligent grids
- The ibuilding
- Energy storage
- Virtual power stations

Building integrated renewable energy technologies

- The sunburnt country
 - Organic photovoltaics
 - Concentrating solar thermal power
 - Solar cooling
- Vibration energy harvesting

The journey so far



30 The Bond
Australian First 5 star ABGR



Chilled beams, winter gardens, naturally ventilated atrium, roof garden, daylight responsive lighting

CSIRO

CSIRO Energy Centre



Mixed mode HVAC, displacement air, daylight sensitive lighting, PV, wind, and co-gen power generation

Council House 2
Australian First 6 star Green Star



Mixed mode HVAC, chilled ceilings, displacement ventilation, chilled beams, shower towers, PV, operable façade, winter gardens, green roof

AusZEH
Australian First Carbon Neutral Project Home



Pixel
Australian First Carbon Neutral Building

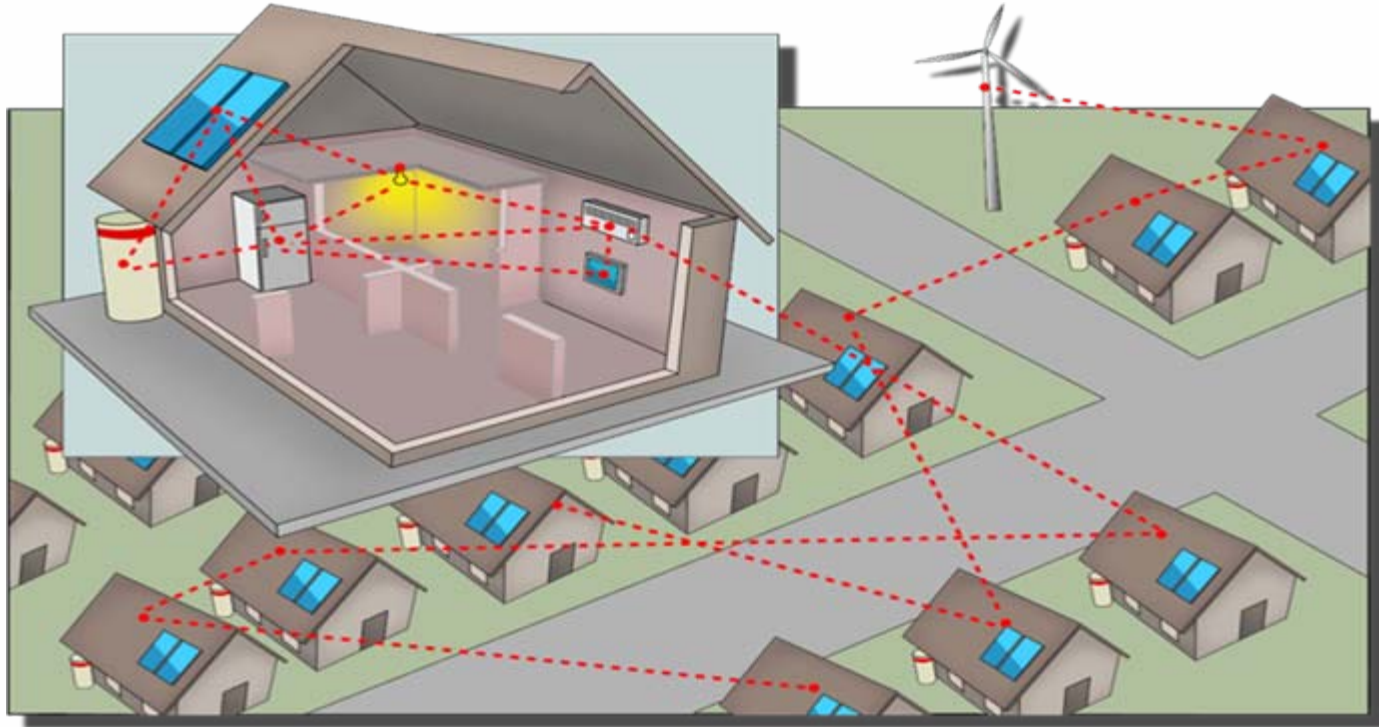


Carbon neutral, low carbon concrete, wind and PV power generation, green roof, water balanced, anaerobic digester

Beyond carbon neutral – solving the energy puzzle



More than just buildings – The Rise of Intelligent Grids







Multi-agent Networks and Intelligent Grids

The iBuilding



HVAC Mode Icons:

-  AIR CONDITIONING is active.
Action required: Please ensure all windows are closed.
-  NATURAL VENTILATION is active.
Action required: Please open your window & ensure stairwell doors are latched open.
-  PEAK - Air conditioning is active & subject to peak electricity tariff (highest cost).
No action required.
-  OFF - Both air conditioning & natural ventilation are disabled.
Action Required: Please ensure all windows are closed.

Survey Instructions

COMFORT SURVEY



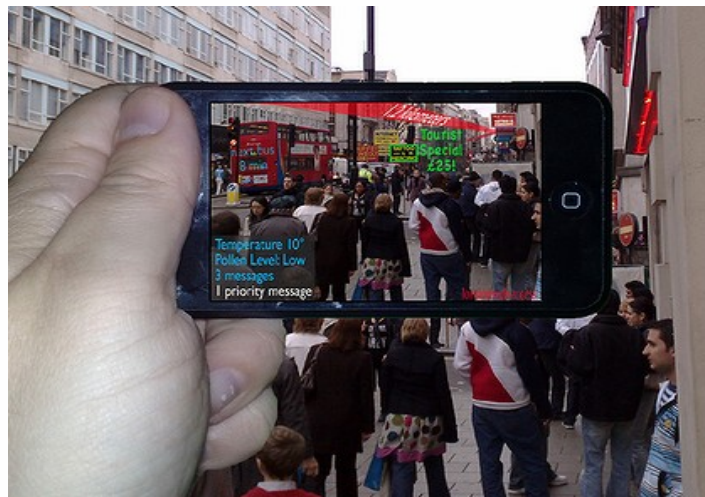
Please select the option that best represents how you feel at this moment:

- Hot
- Warm
- Slightly Warm
- Neutral
- Slightly Cool
- Cool
- Cold

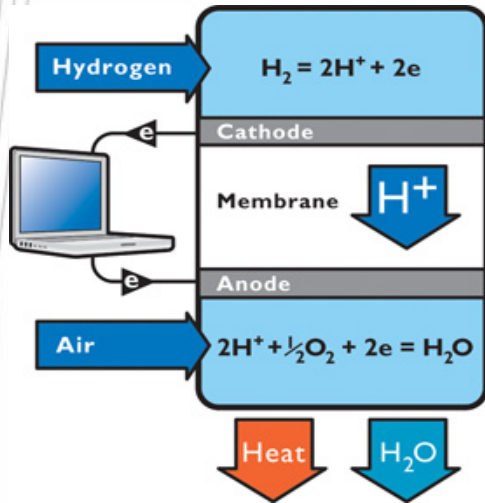
Any additional comments? (optional)

Exit Submit

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Energy Storage

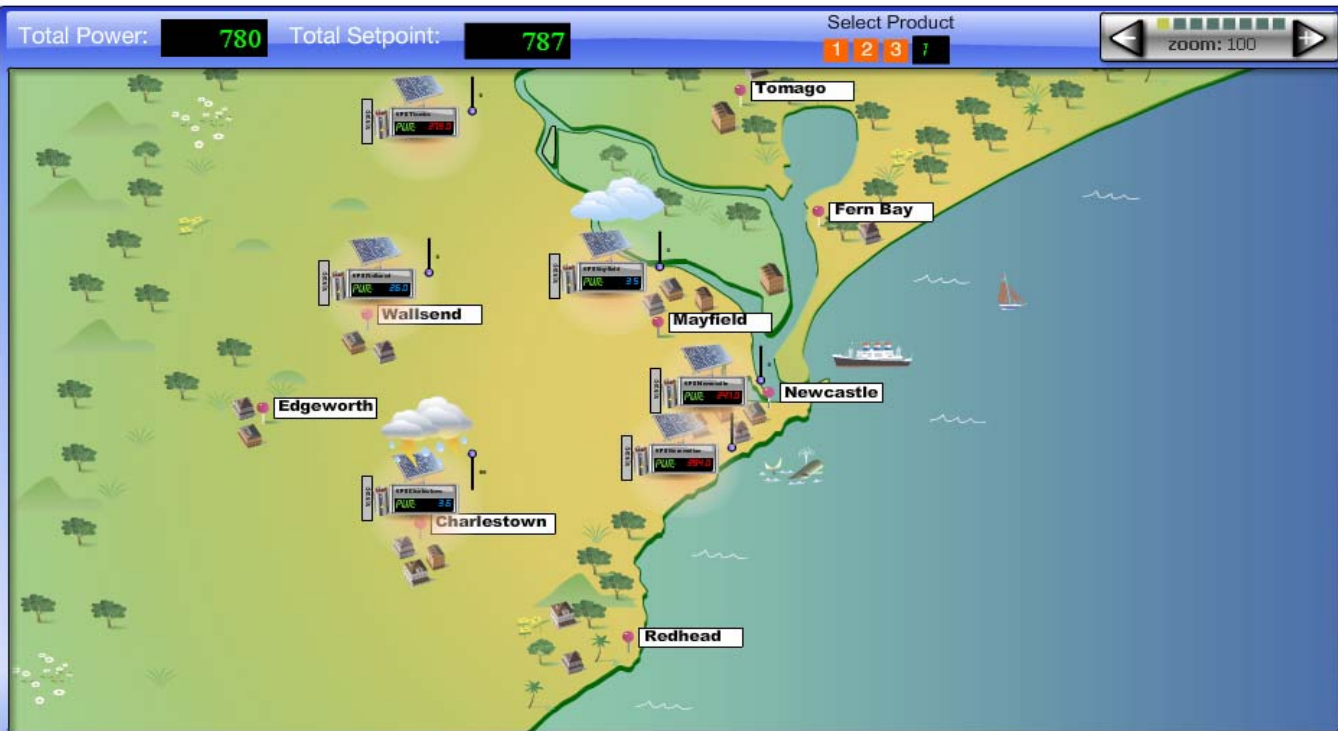


Virtual Power Station

RENEWABLE AGGREGATED POWER

Home View [Interact](#) Details Products

Interact with the Virtual Power Station



Virtual Power Station

RENEWABLE AGGREGATED POWER

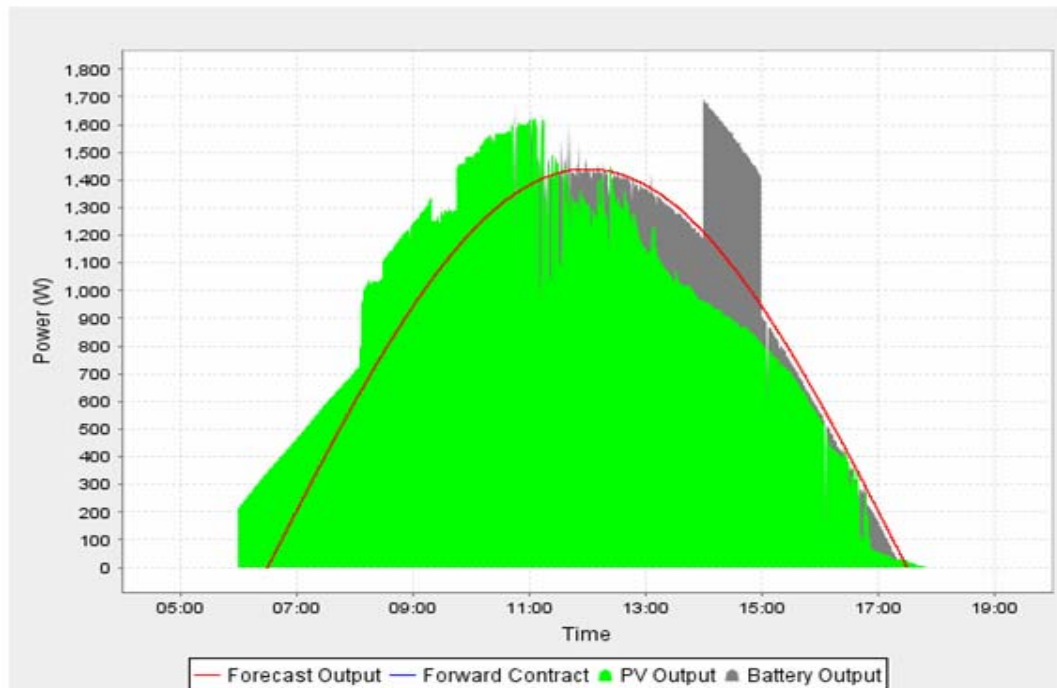
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VPS Total Output

Change Date

October, 2008							
Today							
wk	Sun	Mon	Tue	Wed	Thu	Fri	Sat
39				1	2	3	4
40	5	6	7	8	9	10	11
41	12	13	14	15	16	17	18
42	19	20	21	22	23	24	25
43	26	27	28	29	30	31	

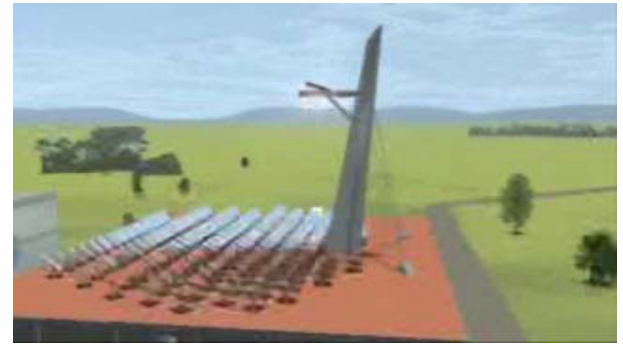
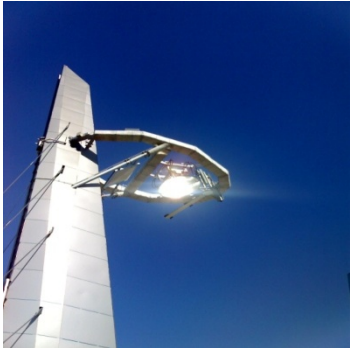
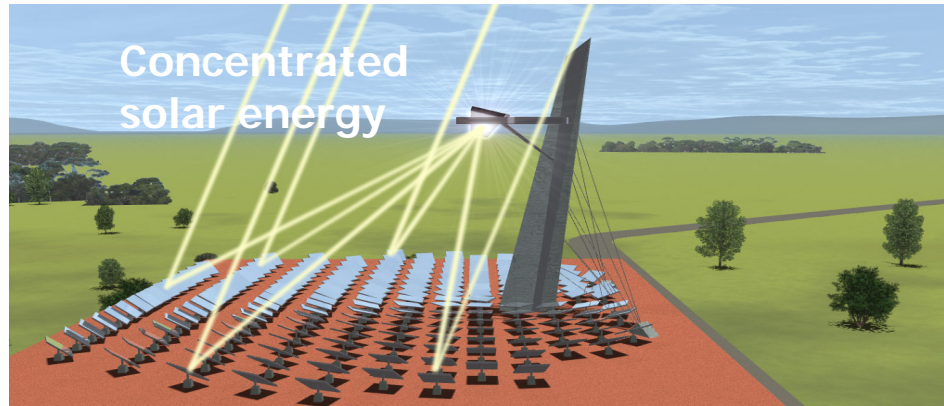
Select date



Organic Photovoltaics

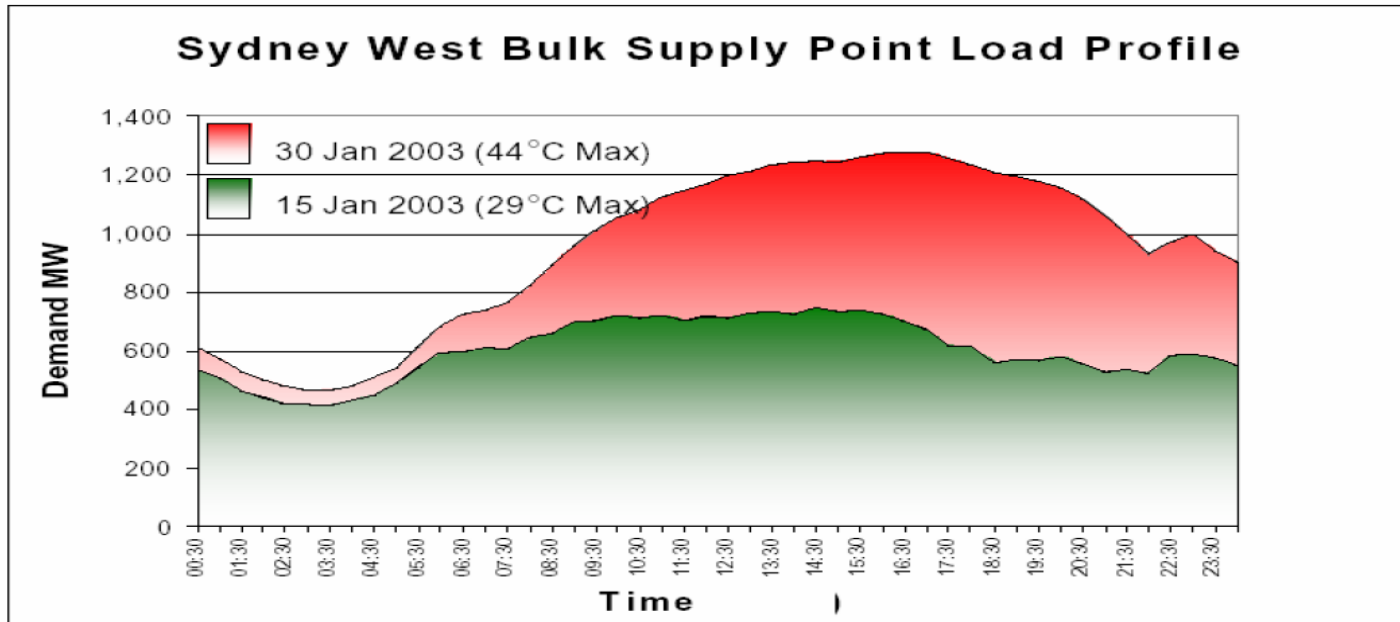


Concentrating solar power



Solar Thermal Cooling Technologies

- There is a strong correlation between solar energy availability and cooling loads.



Solar Thermal Cooling Technologies

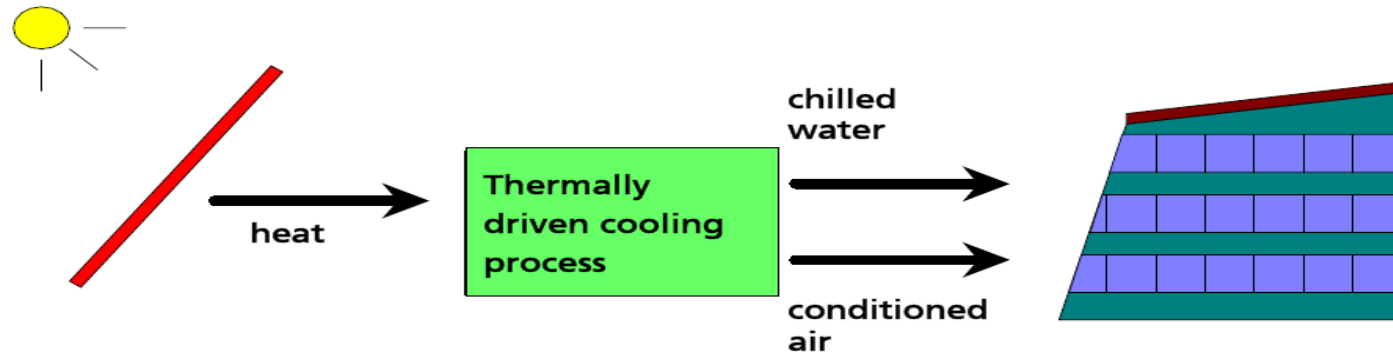
- **Three key types of solar cooling developments:**

Absorption chiller with solar thermal trough collectors

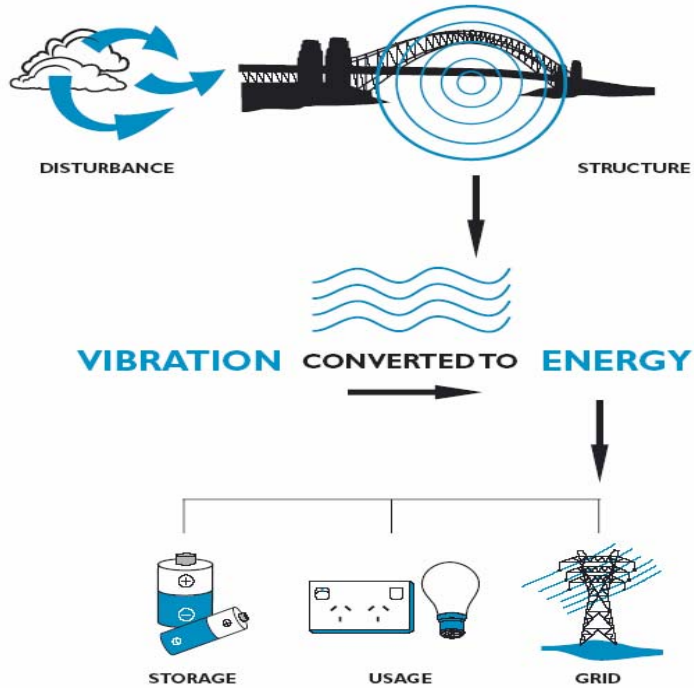
Solar dessicant cooling development based on Hornsby Library
Trigen Air Technology

No moving parts adsorption cooling development

Basic principle



Vibration Energy Harvesting



- Sydney Harbour Bridge vibration = 6.6MW
- Capturing say 10% = 660kW
- Enough power for 220 homes



CSIRO Energy Technology

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Thank you

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