



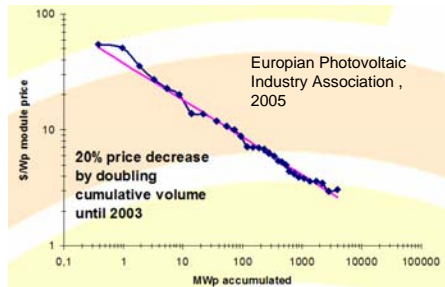
www.csiro.au

IEA follow up task: Australian perspectives

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CSIRO Energy Technology
March 2011



Developing the Australian market



Finding ways to progress down the learning curve must be our goal

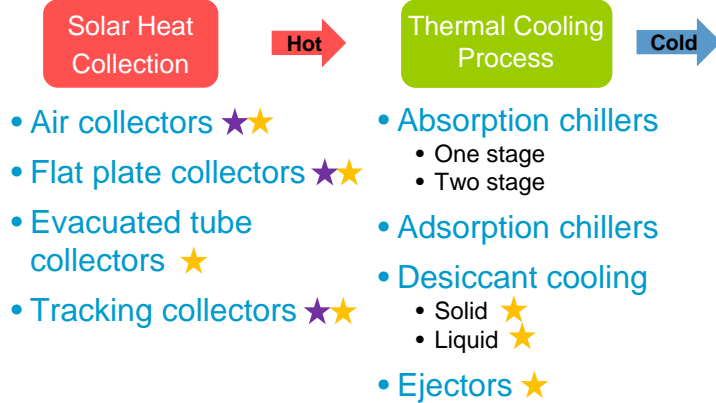
- Niche markets where “energy-only” economics are less important
 - Premium buildings requiring high star rating
 - Constrained electricity networks
- Reduce cost/ increase performance
 - High efficiency components
 - Volume production (off the shelf components)
 - Plug and play deployment (turn-key supply)
 - Capture co-benefits/ dual function

Australian market has unique features

Australian industry is at the leading edge

Australian activities

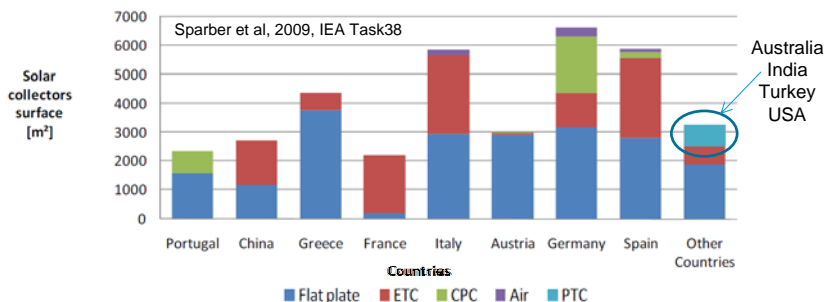
- ★ Manufacturing
- ★ Product development



Noting: System integration with auxiliary equipment items is a separate and also vital development activity

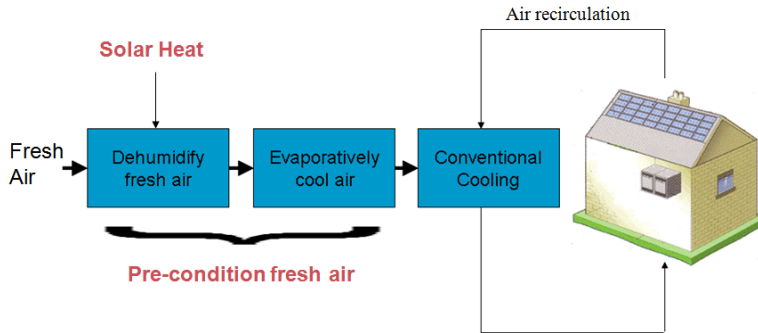
Australian concentrating solar system focus

- Demonstrations with two stage absorption chillers
 - Ipswich, Hospital
 - Charlestown Sq, Retail
 - Inform Energy, Office
- ASI Research
 - ANU/CSIRO/UNSW/Chromasun – Rooftop CST
 - CSIRO/ Thermax – CST power and cooling



Australian low cost hybrid system focus

- Commercial system demonstrations
 - Hunter TAFE
- Product developments
 - Residential solar systems (hot water, space heating, space cooling)
 - Commercial ventilation air pre-conditioning



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But NOT these

KINGS GREEN SOLAR FREEZING your airconditioning running costs

We are proud to be your local certified Solar Hybrid Air Conditioning Installer

Research started on solar hybrid air conditioning over 7 years ago in 2006. Various models of the Omega Absolute Inverter - 350 Series Following advice about the barriers to implementation of solar hybrid air conditioners, the recommendations were as follows:

- reduce the cost of thermal collection production, to simplify the system design;
- to get subsidies from government;

Using the advice we persuaded the government the great grants and many other incentives have contributed to the development of solar hybrid air conditioning. Below is a simple diagram of how the technology uses the power of the sun to reduce the demand for electricity used by the compressor.

Refrigerant gases need to be compressed then condensed to create the low pressure in the coil for the unit. The Thermal Collector 'soaks' heat and expands the gases. The compressor is only required for 20% of the running time in comparison to the conventional 75%.

Simply put the compressor will not need to run as often.

Saving you up to 50% of the electricity required to heat your air conditioning.

There are three major differences in a solar hybrid air conditioner when compared to a regular compressed vapour air:

- The size of the compressor is reduced
- The condenser efficiency is greatly improved by preheating the refrigerant
- The electrical requirement is significantly

<http://www.kogsolar.com.au/techinfo.htm>

EE GREEN SOLAR HYBRID INVERTERS SYSTEM AIR CONDITIONER MODEL EEG-50-01

THE BENEFITS

- More efficient & cheaper to run than traditional split system air conditioner - less on your electricity bill!
- Highest Rating available in Australia
- Cooling: 5.0 kW heat Rating 3.2 Star
- Heating: 5.0 kW heat Rating 3.2 Star
- Super Quiet
- Quietest temperature response
- Friendly to our precious environment
- Easy to use remote control
- 2 year warranty

SOLAR ENERGY is used to superheat the refrigerant which enables the refrigerant to change at the top of the condenser coil. Using this method reduces the heat pressure required to achieve the cooling level in a conventional cooling system. A conventional air conditioning system changes less of the gas into liquid state. Therefore, when the refrigerant enters into the system it is a saturated vapour. The Solar Air Conditioning process allows more of the refrigerant to change state back into liquid faster as well as allowing the reformation of more liquid into the system.

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SEEKING RESEARCHERS DELIVER EFFICIENCY OF CONCEPTS These cut the number of components, changing wires to use the EEG-50-01 Solar Air Conditioner to see the greatest potential efficiency, regulator and wiring.

http://www.eegreen.com.au/assets/EEG_A4_FlyerWEB.pdf

Solar Thermal Air Conditioner Model EEG-50-01

How does our Hybrid Solar Thermal Air Conditioner save energy?

First, our solar collector pre-heats the refrigerant. Second, it pre-heats the air. Third, it pre-heats the air. Fourth, it pre-heats the air. Fifth, it pre-heats the air. Sixth, it pre-heats the air. Seventh, it pre-heats the air. Eighth, it pre-heats the air. Ninth, it pre-heats the air. Tenth, it pre-heats the air.

<http://icesolair.com/index.php/news/>

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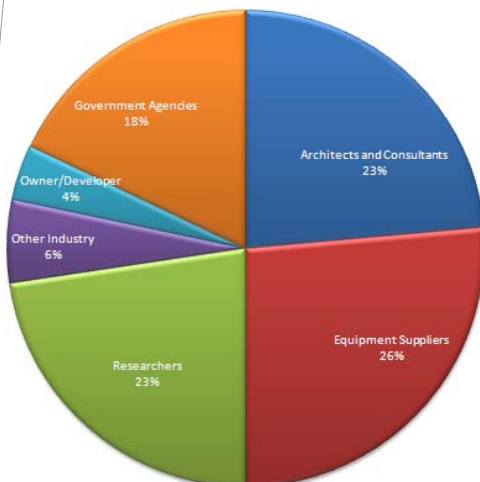
Where to from here ?

- Level playing field access to Renewable industry support (credits, capital, grants etc)
 - Requires technical standards that can be invoked to (i) qualify the system and (ii) assign a “deemed” amount of carbon savings as per AS4234 solar hot water simulation procedure
 - Standards Australia is setting up a committee to do this
- Roadmap & pro-active industry vision
 - Convince government that we can meaningfully contribute to government GHG targets/ aspirations (sufficient scale)
 - Highlight applications/scenarios where we can be competitive against other alternatives
 - Propose a vision and suite of policy/program options that will overcome current barriers and lead to a future self sustaining industry
- Packaged & standardised products (technology push)
- Industry capacity building (training, awareness raising)

IEA is a great vehicle to collaboratively achieve this

Australian ausSCIG would like to help

>210 members



Work-groups

- Technology Roadmap & Barriers Assessment
- Education, Training and Communication
- Demonstration, Funding and Research
- Standards Development

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Possible Australian collaborative contributions (through CSIRO)

- **Standards development** ([link to Standards Australia committee](#))
 - Setting constraints that define minimum conditions that must be achieved for eligibility
 - Establishing procedures/ methodologies for calculating certified carbon savings (eg that could become tradeable certificates)
- **Roadmap development** ([link to IEA SHC roadmap development](#))
 - Australian industry description
 - Australian barriers analysis
 - Australian demonstrations/ case study information
 - Policy options brainstorming and review

Conclusion

- There are compelling reasons for Australia to consider solar airconditioning (compared with other countries)
- Australia has (i) a large number of companies developing unique products with strong potential, (ii) a growing number of system integrators, and (iii) a growing number of demonstrations
- Australia needs to at least ensure a level playing field against other renewable technologies to enable this industry to flourish
- CSIRO can assist with (i) standards development and (ii) roadmapping work packages

Energy Transformed Flagship

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Thank you

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