



Australian Government
**Department of Climate Change
and Energy Efficiency**

Testing Solar Hot Water Systems

Warren Baldsing, DCCEE

February 2013

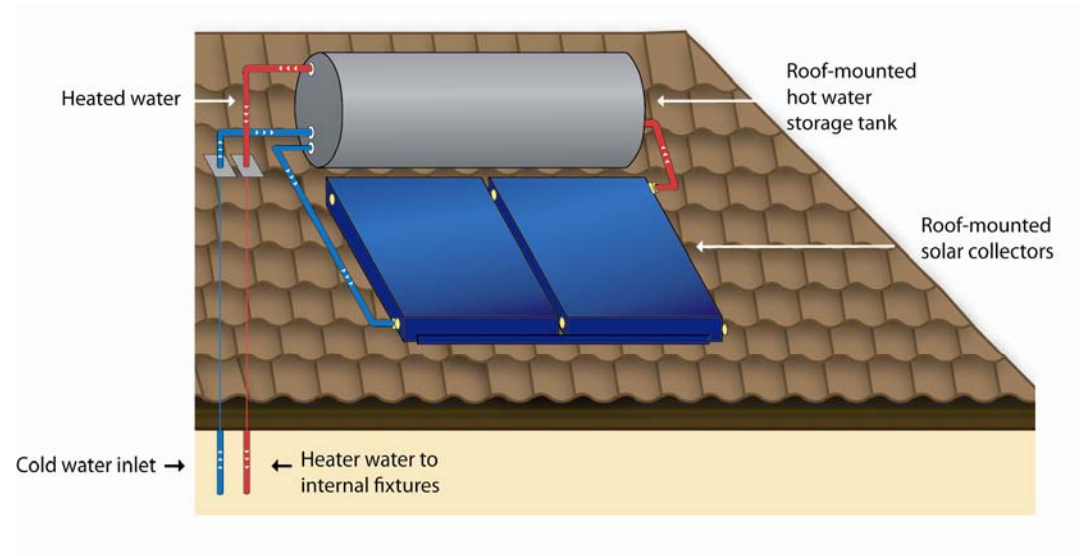
thinkchange



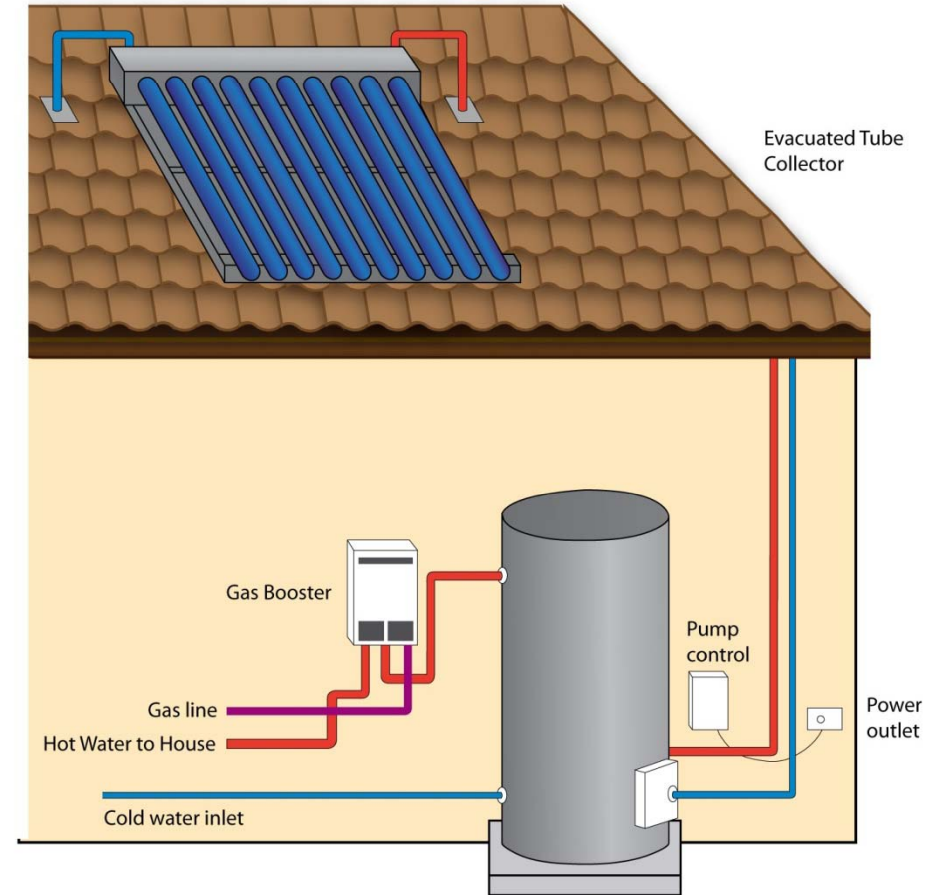
Overview

- **What are solar water heaters?**
- **Why are we doing this?**
- **Existing standards and test methods**
- **What we are looking at**
- **Some results**
- **Where to next?**

Solar water heaters



Thermosiphon



Split system with gas boosting

Why are we doing this?

- **Up to twenty five percent of household energy is used for heating water.**
- **Data indicates poor utilization of technology**
- **Low level of compliance**
- **Low level of installer education**
- **Low level of consumer education**

Standards - Australia

Separate standards covering:

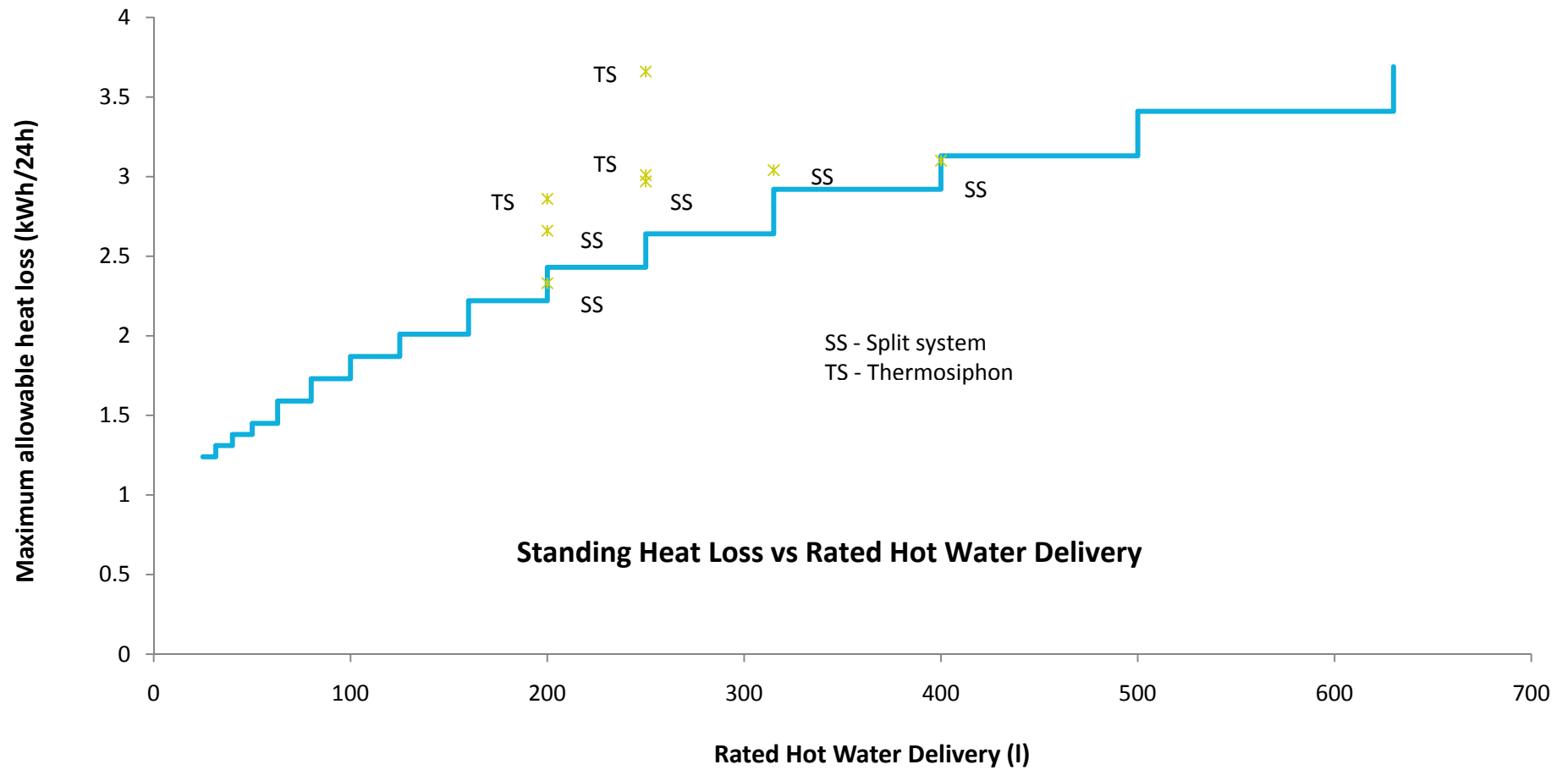
- **Thermal performance of liquid heating collectors**
- **Thermal performance – outdoor test method**
- **Thermal performance – indoor test method**
- **Design and construction**
- **Plumbing requirements for water heaters and storage tanks**
- **Thermal efficiency for gas systems**
- **Calculation of energy consumption**

What we are looking at

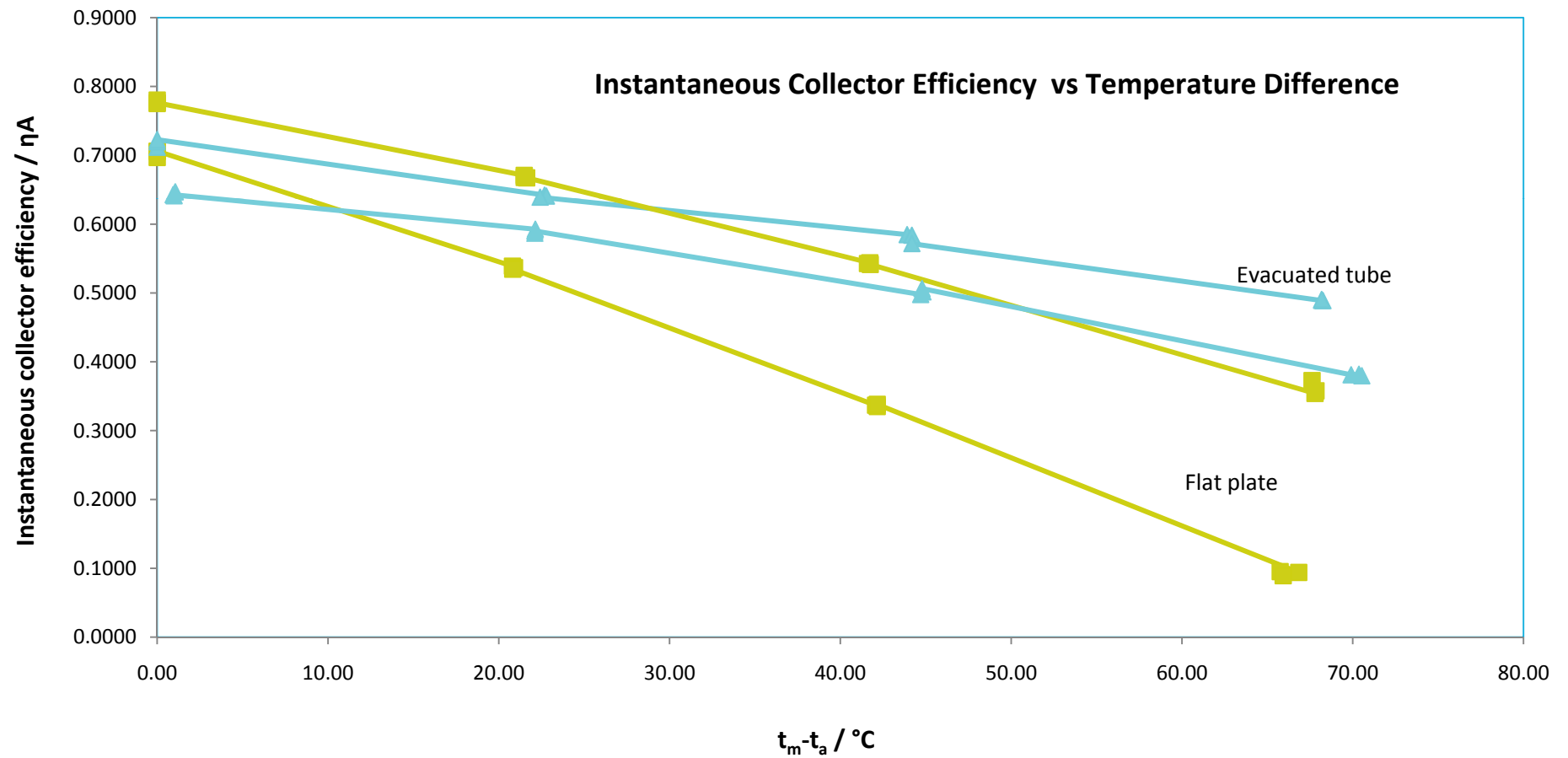
The following characteristics are being examined:

- **Standing heat loss from storage tank**
- **System heat loss with and without solar gain**
- **Collector efficiency based on outdoor and indoor test methods**
- **Collector resistance to impact and freezing**
- **Thermal efficiency and maintenance gas consumption**
- **Modelling energy consumption in Australian and New Zealand climate zones**

Some results



Some results



Where to next

Energy efficiency of solar water heaters can be improved by:

- **Lowering system heat loss**
- **Optimising system to suit climate zone**
- **Education programs**
- **What others are doing**
- **More data to come**

Conclusion

Solar hot water systems:

- Tank
- Collectors
- Pump
- Pipes and connections
- Boosting systems

Product Profile to come

Acknowledgement

DCCEE

Heating Air-conditioning and Refrigeration Team

HART

Sara Williams
Michael Whitelaw
Jay Hender
Gemma Godwin
David Rochford
Kimberley Height

and

E3 Committee