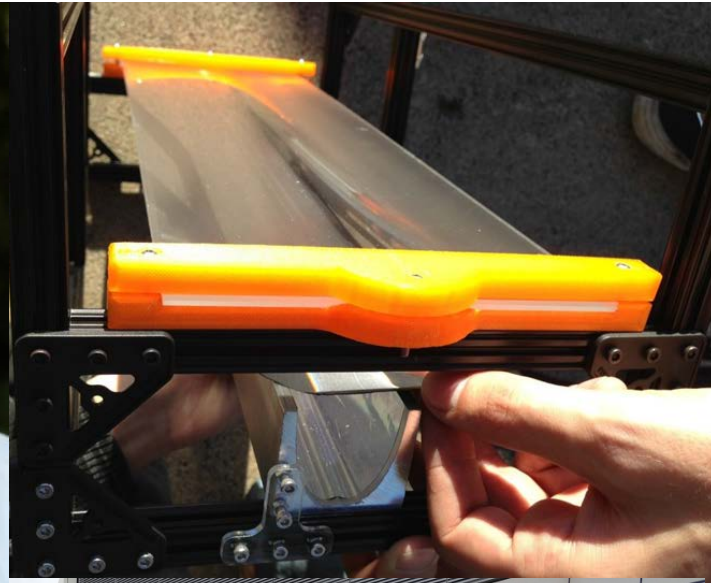
UNSW SYDNEY | Australia's Global University

School of Photovoltaic and Renewable Energy Engineering

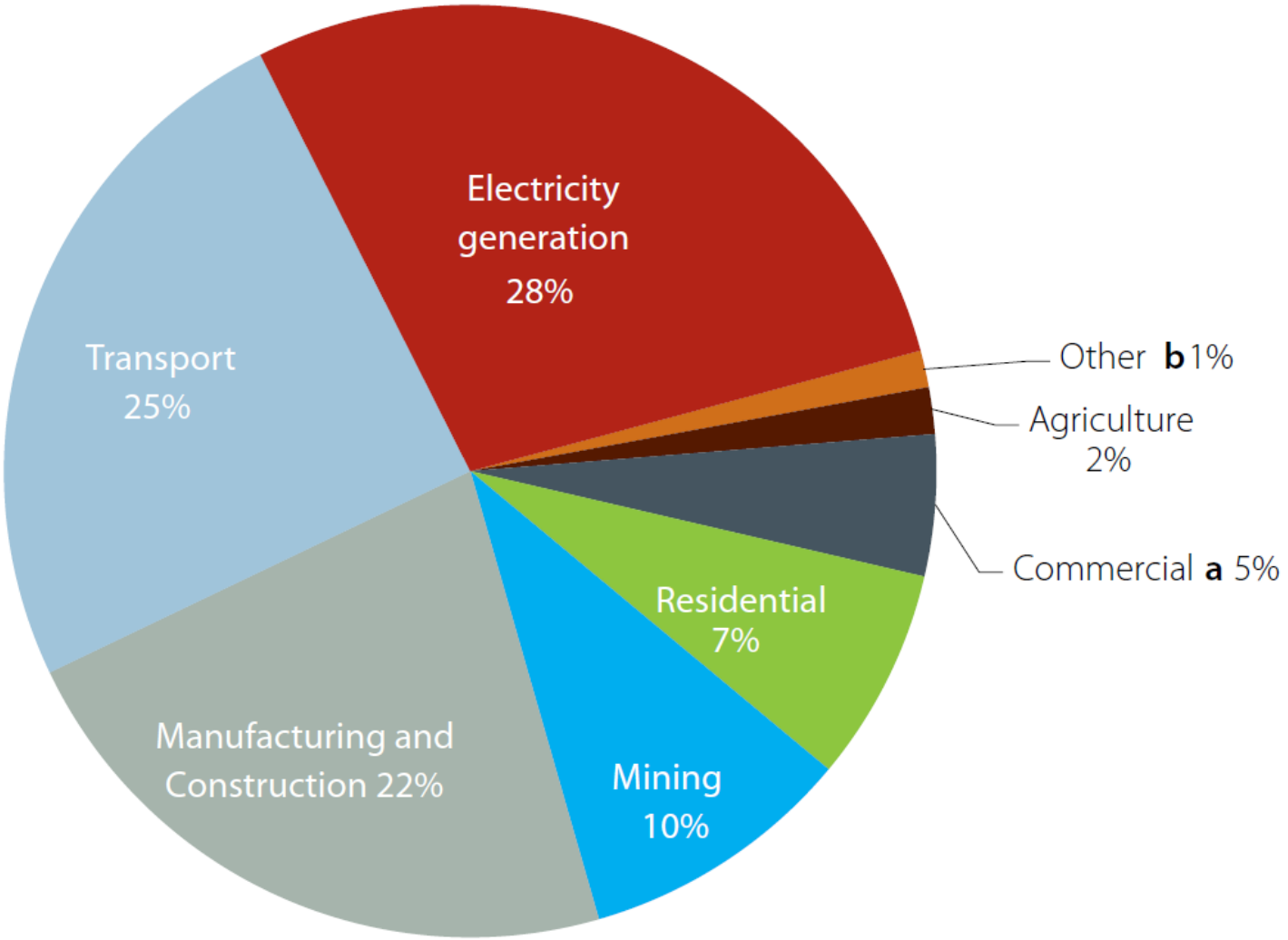
Solar Thermal



新南威尔士大学火炬创新园区
Torch Innovation Precinct at UNSW

More information contact: Dr Robert Taylor (robert.taylor@unsw.edu.au)

Solar Thermal Provides the Whole ‘Energy Pie’

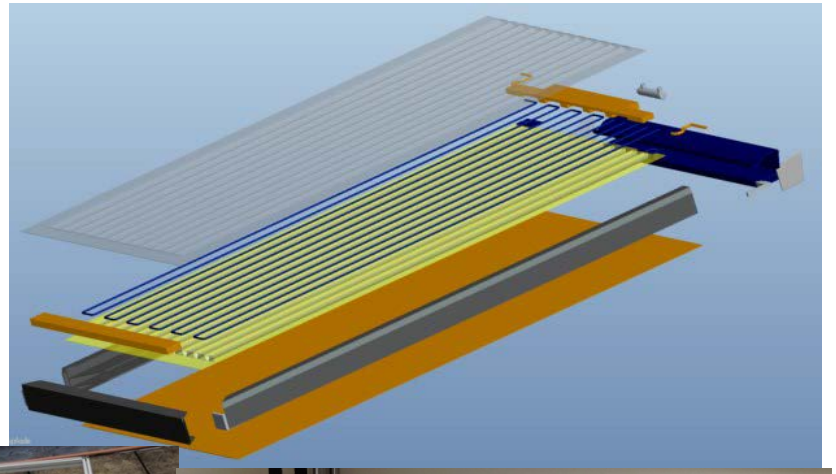


Australian Energy Consumption by Sector

Source: http://www.bree.gov.au/

Main Areas of Research (Solar Thermal)

Ranges from Basic Research to Prototypes On:

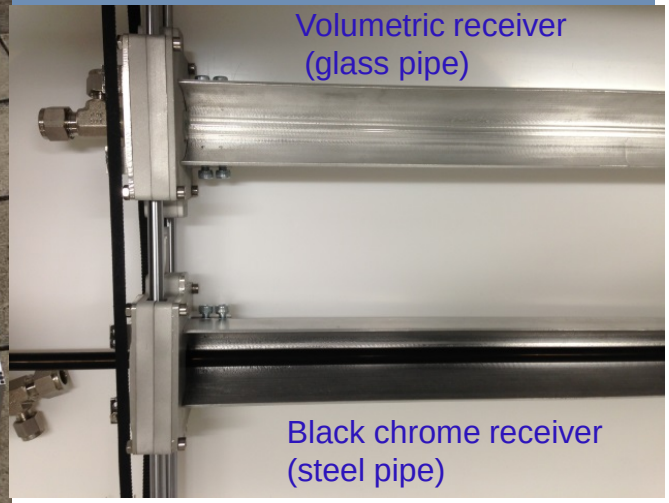


New Solar Thermal Collectors

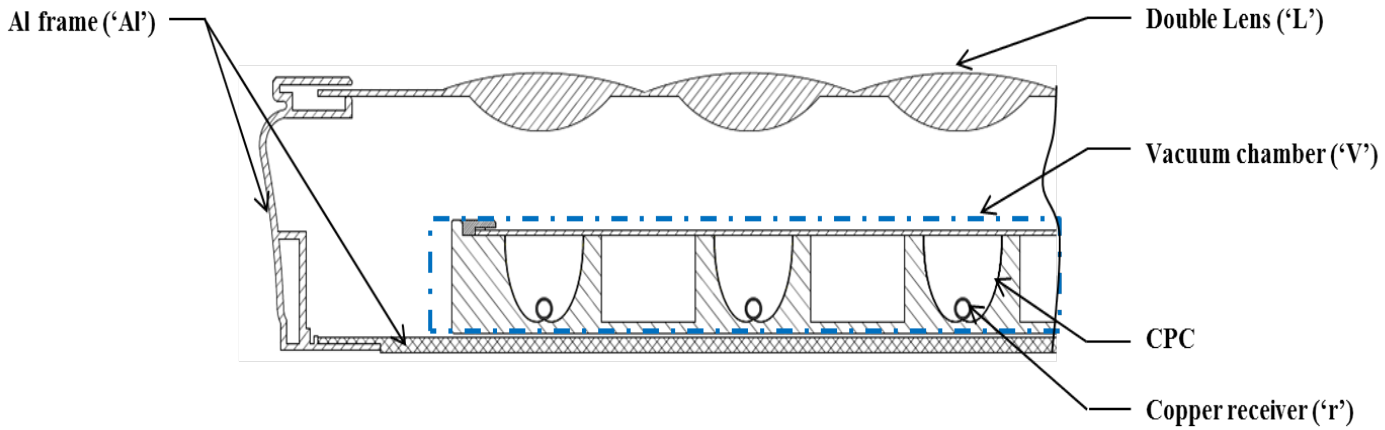
- Rooftop optics, packaging
- Industrial heat supply (↑ temperature)
- 10cm height (utilise PV infrastructure)

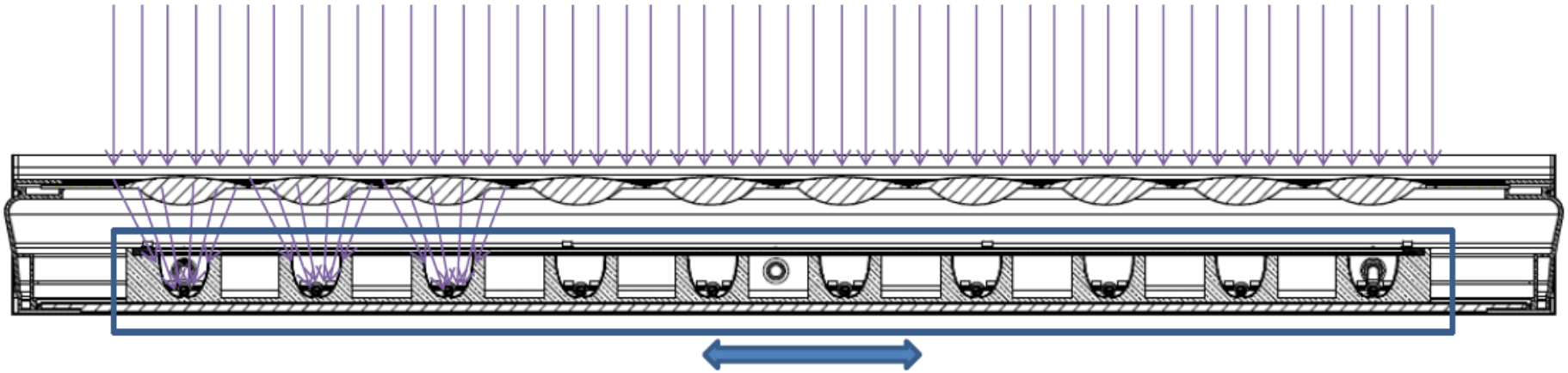
New Types of Absorbers

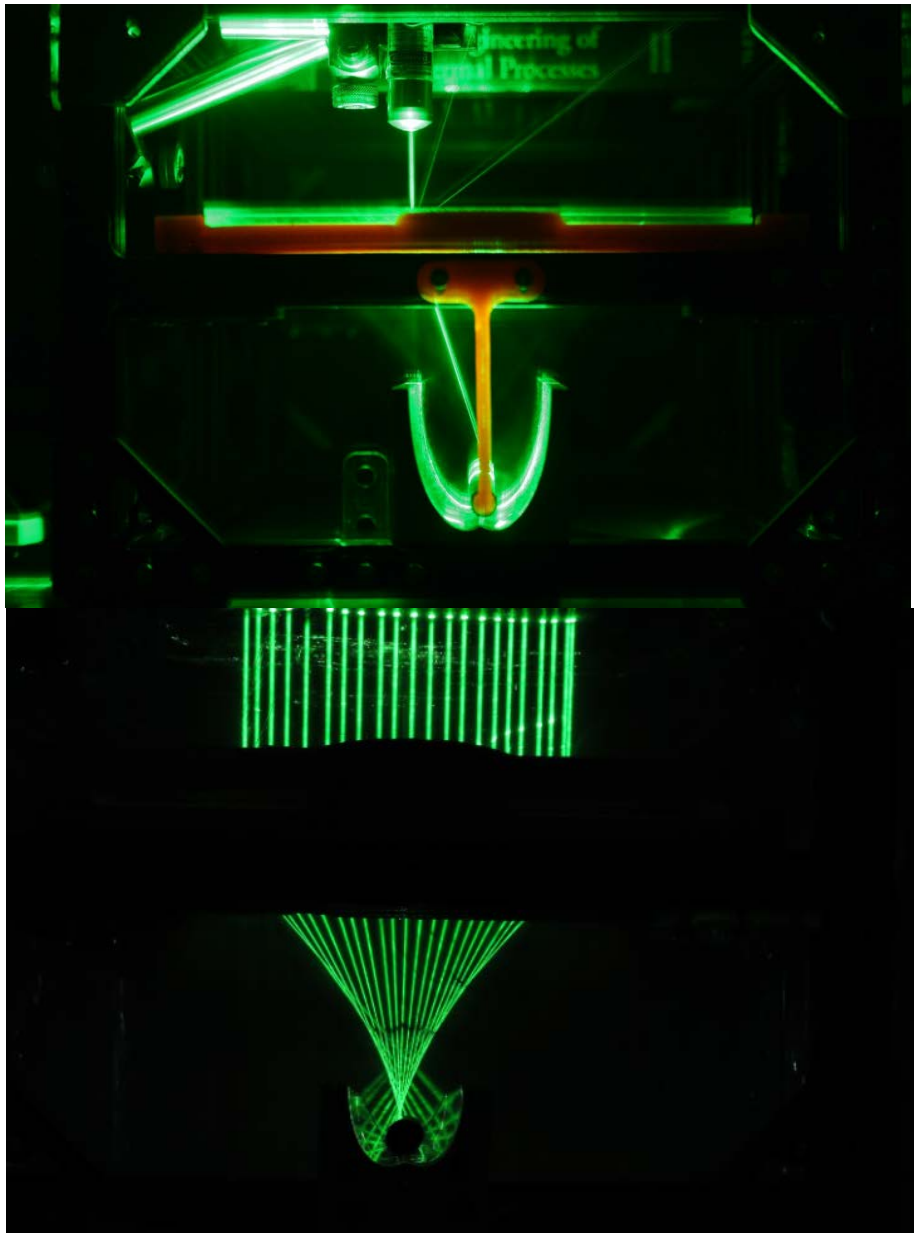
- Volumetric (liquid) absorbers
- Reliable @ high temperatures
- Work as Pure Thermal Absorbers
- Work for Heat and Electricity (light filters)



Our Patented Design

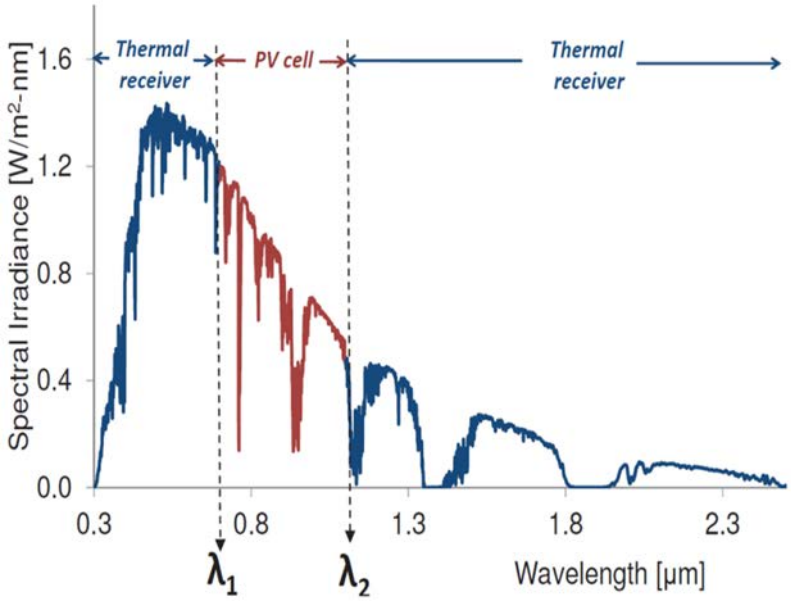


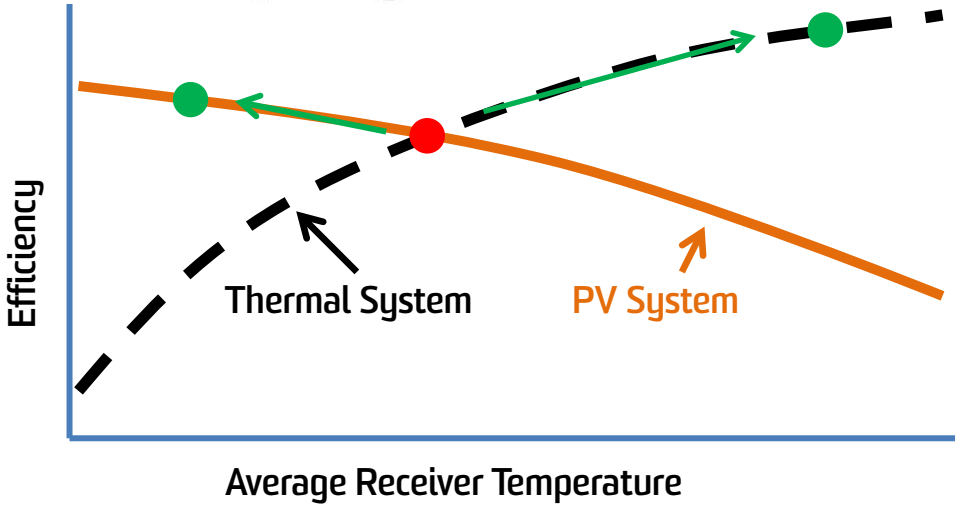


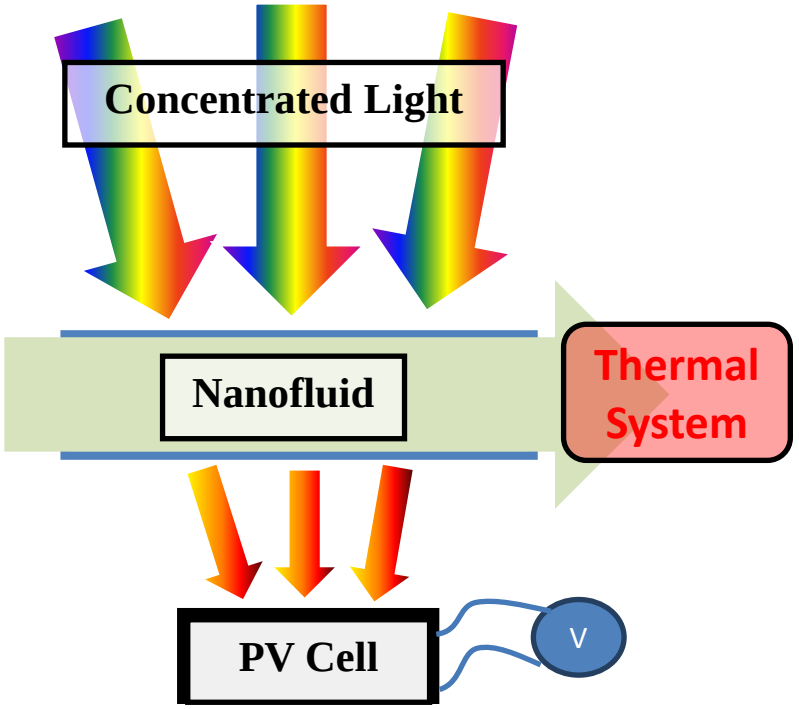



50mm

Absorbers: …for both Heat and Electricity



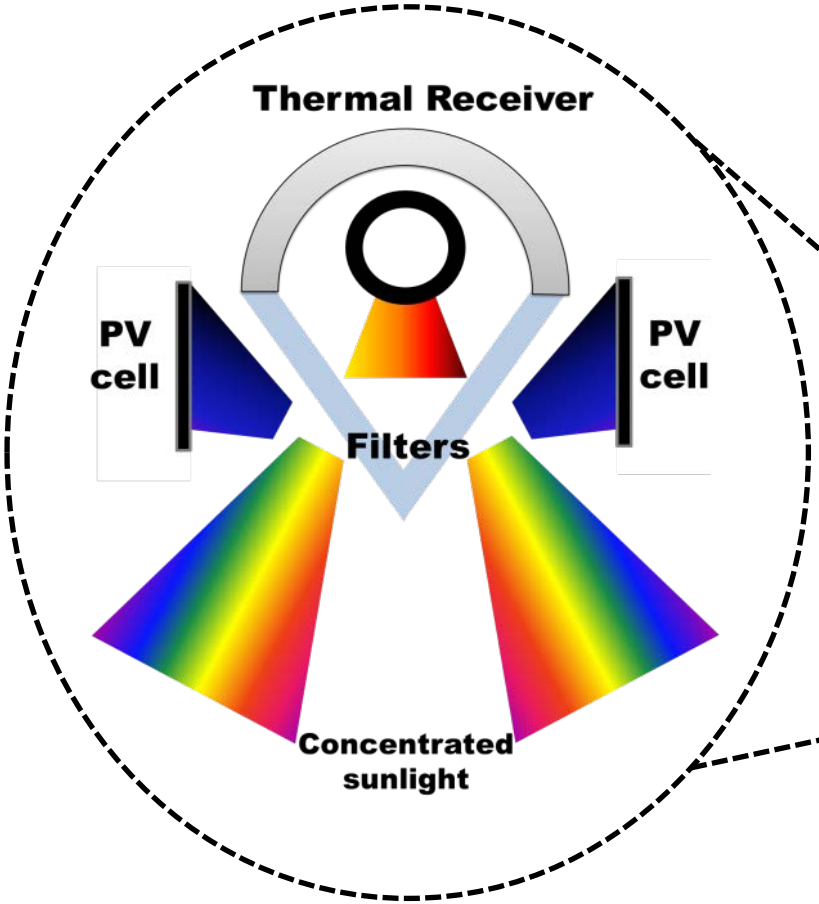


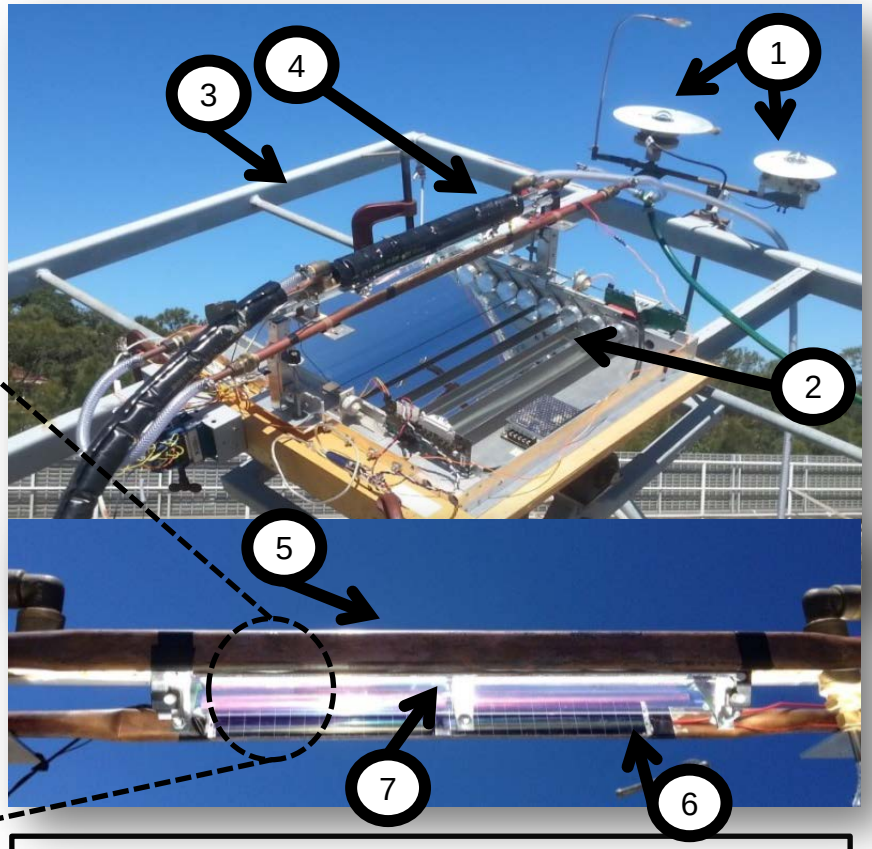


PV spectrum: Crisostomo et. al, Beam splitting system for the development of a concentrating linear Fresnel solar hybrid PV/T collector, in ASME 2013 Summer Heat Transfer Conference, Minneapolis.

Taylor, R.A., Otanicar, T.P., Hewakuruppu, Y., Bremond, F. Hawkes, E.R., Jiang, X, Coulombe, S., "Feasibility of Nanofluid-Based Optical Filters", Applied Optics, **52**, 7, pp. 1413-1422, 2013.

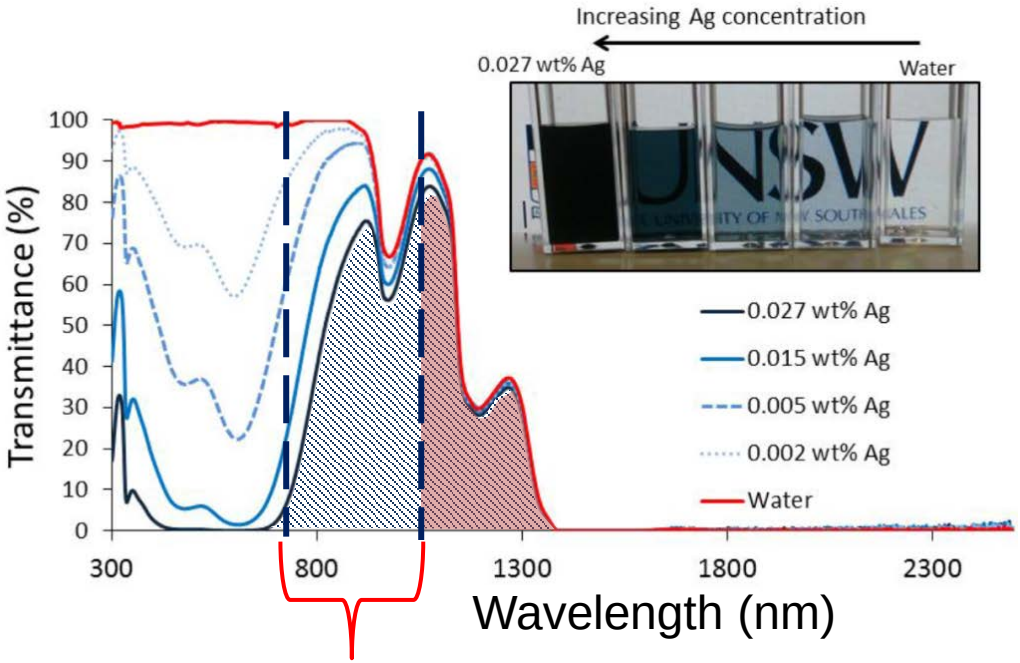
PV/T: Dichroic Mirror Filters





1. Pyranometers
2. Fresnel mirrors
3. Tracking system
4. Thermal receiver
5. PV cooling tube
6. PV cells array
7. Dichroic mirrors

Nanoparticle-Based Liquid Filters



Optimal Transmittance Window

- *Transmitted to PV (most concentrated fluid)*
- *Non-ideal Transmission*