

# Renewable Energy and Environmentally Sustainable Design Case Studies

## Warranwood – SHW & Wood Stove

*“The system is very effective at boosting water temperature beyond the gas setting on even partly overcast days. ... The wood stove with the heat exchange system is extremely effective in heating the kitchen area. Within 10 minutes of lighting, there is useful radiant heat being generated from the stove. The hot water is also noticeably hotter within a few hours of lighting, so the heat exchanger is working effectively.”*

**Bill Barling, 14/6/12**

### Site:

Warranwood, Melbourne, Victoria

### Dates:

- System Design: May 2011
- System Installation: July-August 2011
- System Commissioned: August 2011

### Client:

Bill Barling

### Project Goals:

This was a challenging site, with some shade issues to consider and a subsequent lack of sunny, north facing roof. The customer's existing hot water service was a gravity fed electric storage, with wood boosting from the previous (worn out) wood stove and wetback. The electricity consumption from the hot water tank accounted for almost half of their total electricity bill. The old tank was located in a first floor attic cupboard area (directly under the new tank and booster positions) that is now the home of the heat exchanger, with the further benefit for the customer of gaining much more space in this cupboard by removing the old tank.

The customer wanted a new wood stove for both cooking and space heating and saw benefits in the new stove and flueing being visually neater and more space-efficient than previously. The Nectre Bakers Oven was technically assessed as being the most suitable unit for the customer's purposes i.e. space heating of the kitchen and lounge area especially, wood fired oven and stovetop cooking and boosting of the hot water system in the cooler months of the year.

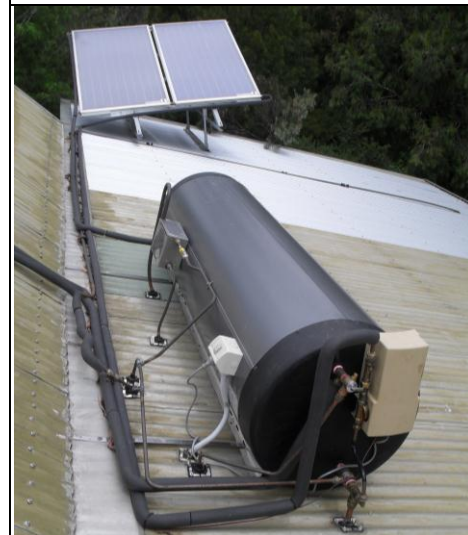
We proposed an innovative solar hot water system: external roof mounted stainless steel tank with



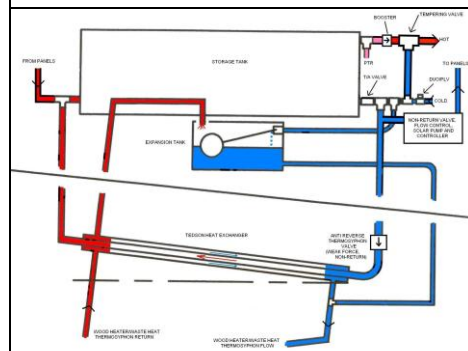
SHW Tank & Panels on Roof



Solar Panels, Tank & Gas Booster



SHW Tank & Panels



System Schematic

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instantaneous gas boosting (mounted on a nearby brick chimney), using a pumped heat transfer loop for the solar panels and two thermosyphon heat transfer loops each side of a Tedson heat exchanger for gathering heat from a wetback – another heat exchanger – in a Nectre Bakers Oven.

The solar panels were 'side pitched' to face NNW at 25 degrees on the sunniest roof position available, paying careful attention to minimising the considerable negative visual impact that this sort of panel installation can have. (The result was virtually hidden from all ground level perspectives on the property). An instantaneous gas booster and 50 degree tempering valve was installed between the tank and the line feeding the hot water outlets.

## Project Features:

The system consists of:

- 1 x Rinnai Prestige Mk II 330L Stainless Steel Gas Boost Tank – Titanium.
- 2 x Rinnai Excelsior FTC Premium Copper Solar Collector Panels.
- 1 x Side-Pitch Frame.
- 1 x Sun Ray Tedson Heat Exchanger.
- 1 x Rinnai Solar Infinity 20 External Natural Gas Booster.
- 1 x Nectre Bakers Oven with wetback.

Special features:

- Solar hot water panels located on side-pitch frames in sunniest position (while still leaving space for future installation of PV panels).
- Capture of heat from wet back to boost the system and reduce auxiliary heating.
- Instantaneous gas back-up replaces costly electrical boosting.
- Stainless steel tank.
- Mains pressure delivery of hot water supply.

## Project Team:

- Mark Donaldson, System Designer, Going Solar
- Darren Bride, Plumber

## Further Information:

- [mark@goingsolar.com.au](mailto:mark@goingsolar.com.au)
- [www.goingsolar.com.au](http://www.goingsolar.com.au)
- (03) 9348 1000



**Gas Booster**



**Heat Exchanger**



**Nectre Bakers Oven**