



Hybrid solar water heating solutions

Dr Gerrit Genis

April 2016



A Sustainable Energy Services Company (SESC)
that provides hybrid solar water heating solutions



Background

Business founded in 2011

- Installing LED lights, and
- Energy-saving shower heads
- Performing green audits

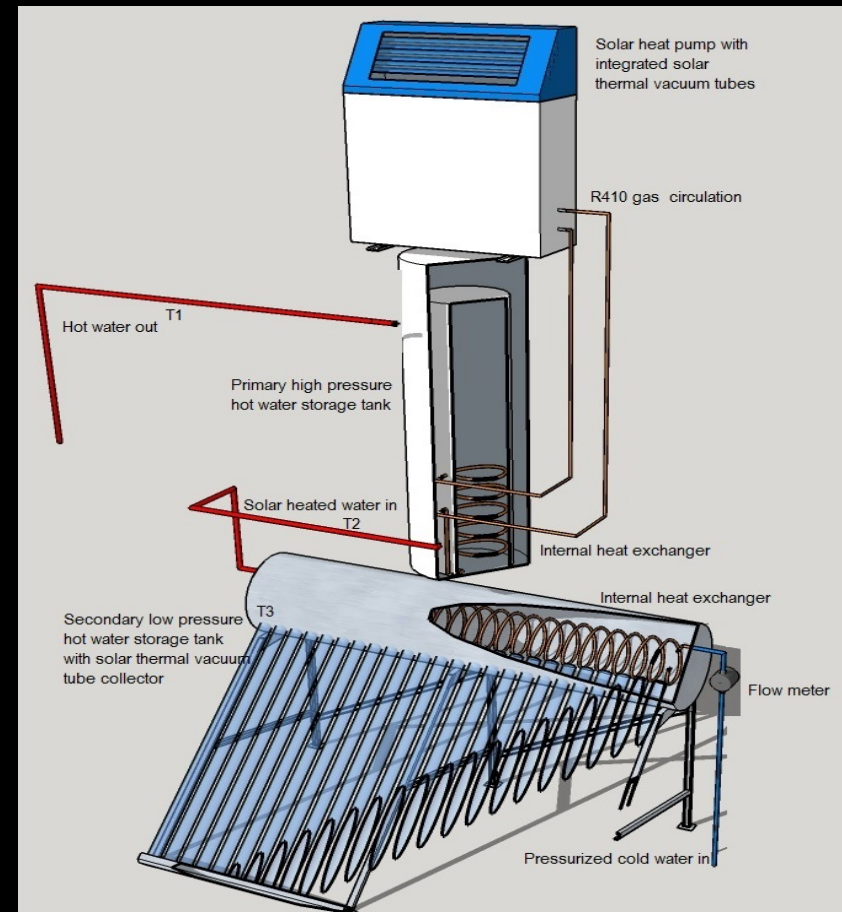
→ People in retirement homes spend > 60% of electricity spend is on hot water heating

→ Research: Solar water heating technology



Combine

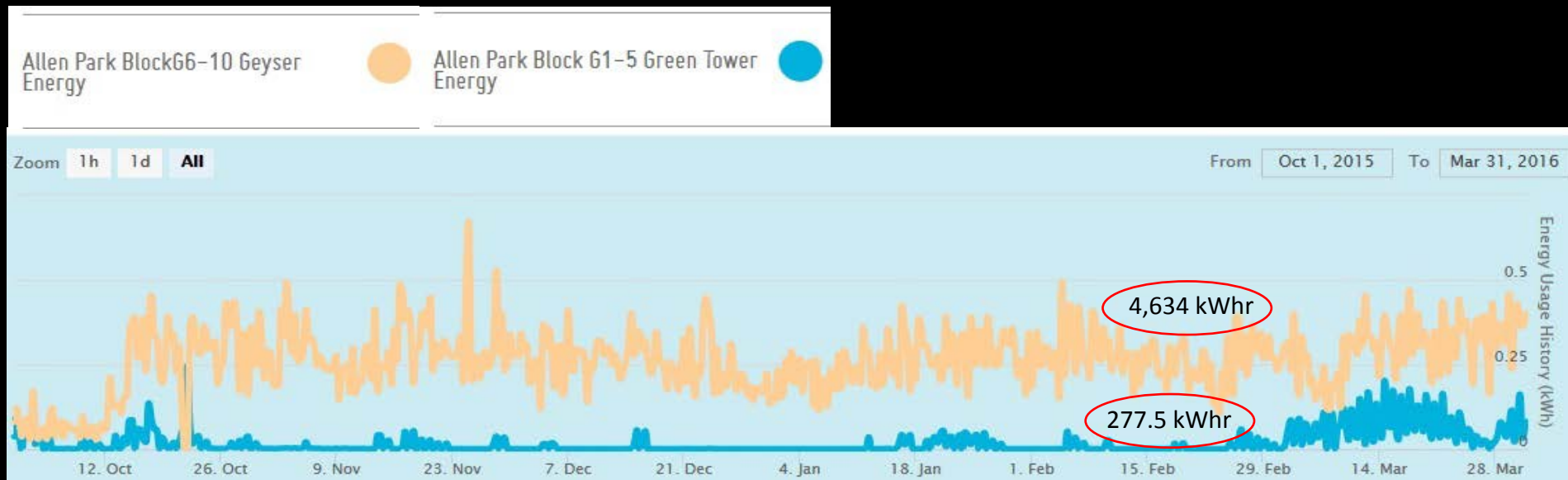
- A solar thermal heat pump;
- A solar thermal collector array; and
- A patented energy storage scheme, with
- An Internet-of-Things (IoT) approach = **GreenTower!**





Proven savings

- 90% in electricity use compared to geysers!
- An additional saving of 15% in water use





Further Benefits

Add minimal solar PV to go off-grid –

(Surplus energy available for LED lighting & other essentials)

Innovative energy storage arrangement

(90% of energy storage captured in water storage tanks)

↳ A significant rating reduction of Lithium batteries

Modular design :

Scales from single households to district water heating

Roof space area required - only 40% of regular solar collectors



What we bring

- Thermohydraulics
- Electronics & S/W engineering
- Solid R&D experience
- Commercial background & Management experience
- Renewables Academy (RENAC) training

Established supply chains for equipment

- Opportunities for Human Capital development:
 - Assembly and installations of GreenTowers;
 - Maintenance and support;
 - Managing procurement and logistics, etc.



Technical experience required

- The optimal use of inverter heat pumps (for hybrid solar air conditioning)
- Innovative energy storage alternatives
- Battery management for Lithium batteries
- Implementation of Internet-based, software-managed hybrid solar equipment (IoT)
- Leading-edge PV experience
- Grey water processing



Achievable Savings

(Based on actual results)

- 230 kWh in energy,
- 1.6 kVA in demand, and
- 1,100 liter water per month; and
- 2.6 ton carbon offset annually.

... per electric geyser replaced

- WINNER 2014 -

SMART LIVING CHALLENGE



GREEN TOWER

W. Lyng *Annabelle* *Thomas Skell*
Almeta *Peter Vaden* *Peter Ny*
Klaxon

The Jury of Smart Living Challenge at the City Hall in Stockholm, December 11, 2014

JURY MOTIVATION

*An energy efficient and climate friendly solution to an every day problem in many countries
by using solar to power both a heat pump and for storing hot water.
A smart solution not needing roof placement or fossil fuels.*