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DESERT KNOWLEDGE AUSTRALIA SOLAR CENTRE, SYSTEMS COMPARISON

Introduction

The data for the graphs in this document is courtesy of and has been down loaded from Desert Knowledge Australia Solar Centre website http://www.dkasolarcentre.com.au .The information displayed in the following document is Kyocera Solar Pty Ltd interpretation of the data.

Desert Knowledge Australia, the Australian Government, the Northern Territory Government and the project managers, CAT Projects do not endorse, and accept no legal liability whatsoever arising from or connected to, the outcomes and conclusions associated with the use of data from the Desert Knowledge Australia Solar Centre.

The graphs have been derived from 5 minute average AC kW measurements, compiled to daily AC kWh values and normalised to average AC kilowatt hour per DC kilowatt peak (AC kWh per DC kWp) for each month. Normalised system data allows comparisons to be made of how much energy is being generated for every kilowatt of solar modules that have been installed. This allows comparisons of systems with different array sizes.

This analysis is of Kyocera polycrystalline technology and other crystalline solar module manufactures. In these examples, the different systems are designated by manufactures name followed by the Desert Knowledge Australia Solar Centre system description name in brackets. The Desert Knowledge Australia Solar Centre names have been given to allow easy reference back to these systems on the Desert Knowledge Australia Solar Centre website.

While there are a number of other systems at this site, this comparison is of systems in which all solar arrays are at a fixed tilt of 25 degrees facing true North. The systems in this comparison are:

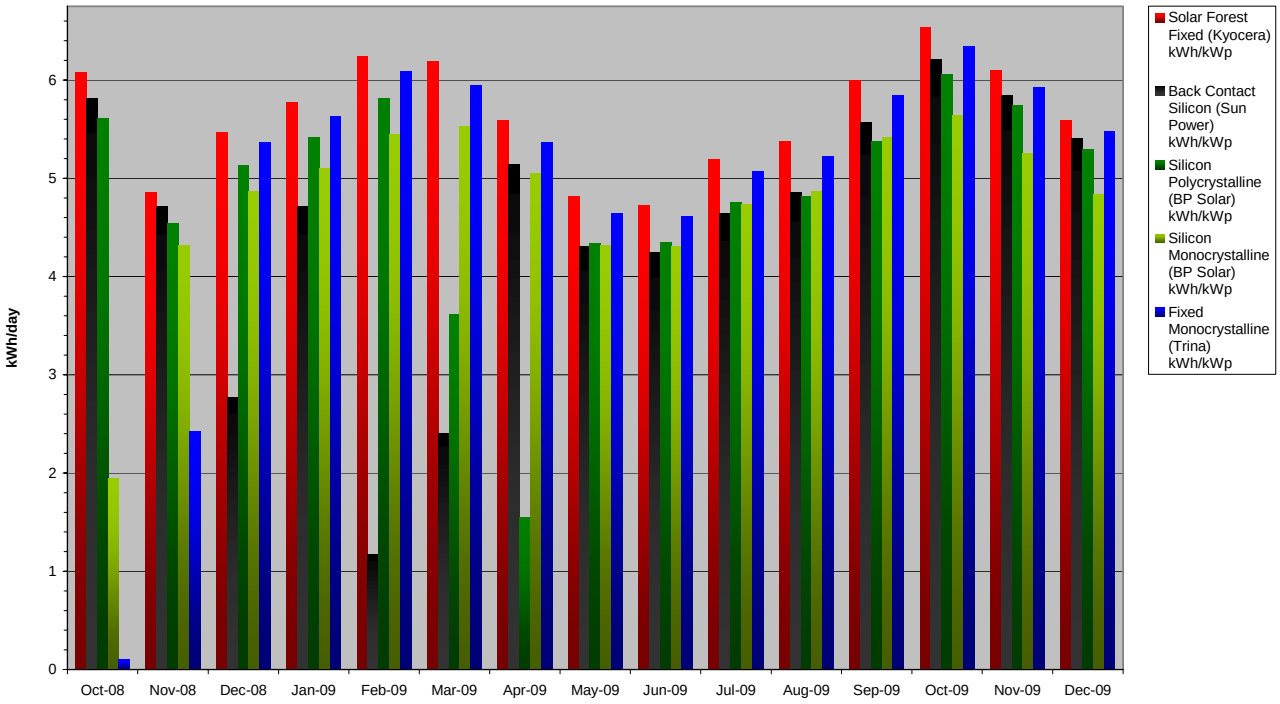
- Kyocera (Solar Forest Fixed) comprising of 40x KD135GX (135W) modules. Total 5.4kWp.
- SunPower (Back Contact Silicon) comprising of 27x SPR-215-WHT (215W) modules. Total 5.805kWp.
- BP Solar Poly (Silicon Polycrystalline) comprising of 30x BP3165 (165W) modules. Total 4.95kWp.
- BP Solar Mono (Silicon Monocrystalline) comprising of 30x BP3170 (170W) modules. Total 5.1kWp
- Trina (Fixed Monocrystalline) comprising of 30x TSM 175D (175W) modules. Total 5.25kWp

Because the solar modules are all mounted and orientated the same way, each system will be subject to the same insolation and temperatures allowing comparisons between systems to be made. It should be noted that these results are for grid connected system yields not just the module yields.

Monthly data

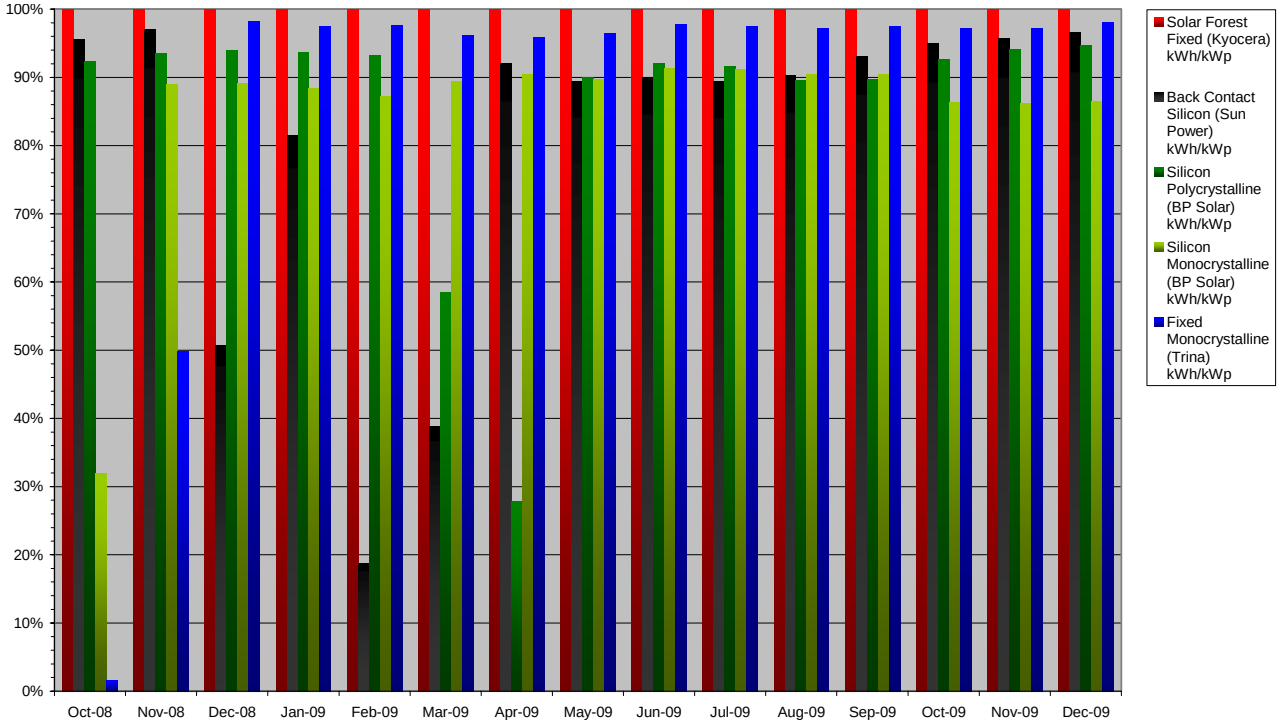
Each monthly average is calculated from the total kWh generated per month divided by the number of days in the month. It should be noted that in Graphs1 and 2 there are various months where energy yields are lower than what is expected for some systems. There are a number of reasons for this, such as inverter faults, data measurement / recording issues or other reasons.

Graph 1: Average per month AC kWh / DC kWp



Graph 2: % of the maximum average AC kWh per DC kWp per month

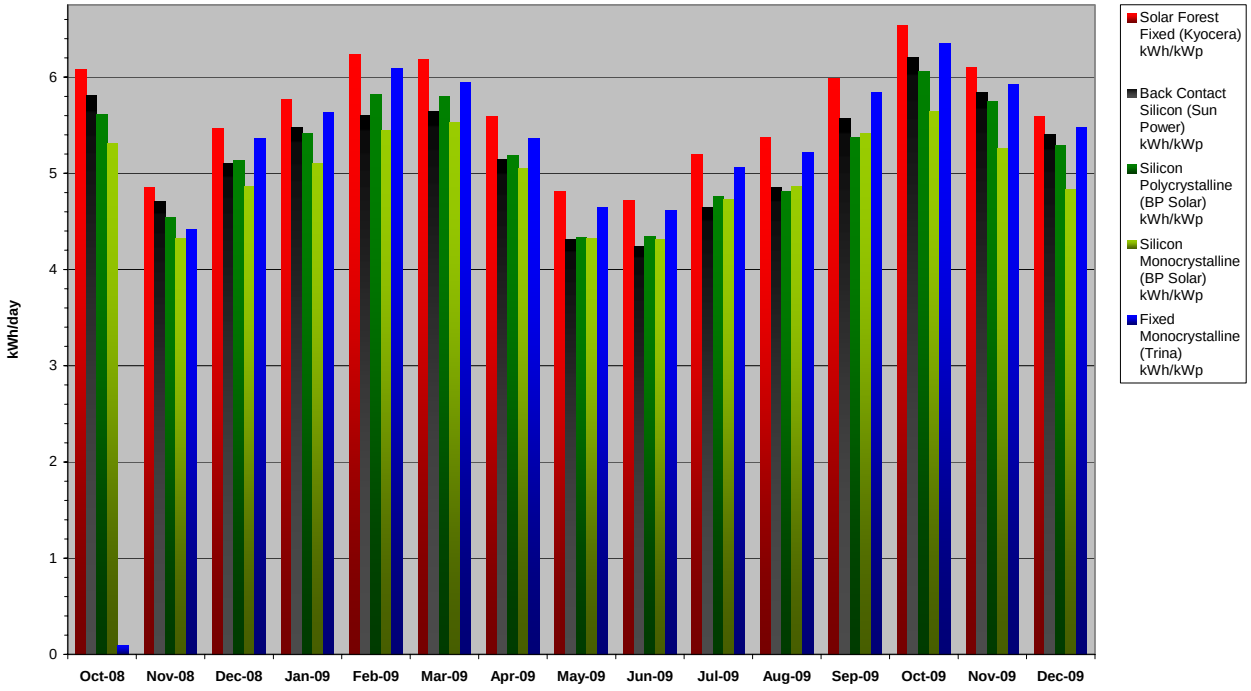
For each month in this graph the system with the maximum average kWh/kWp has been used to baseline the result for that month, i.e. the system with the maximum kWh/kWp for that month will equal 100% and the other systems will be shown relative to that maximum.



Monthly data from operational systems

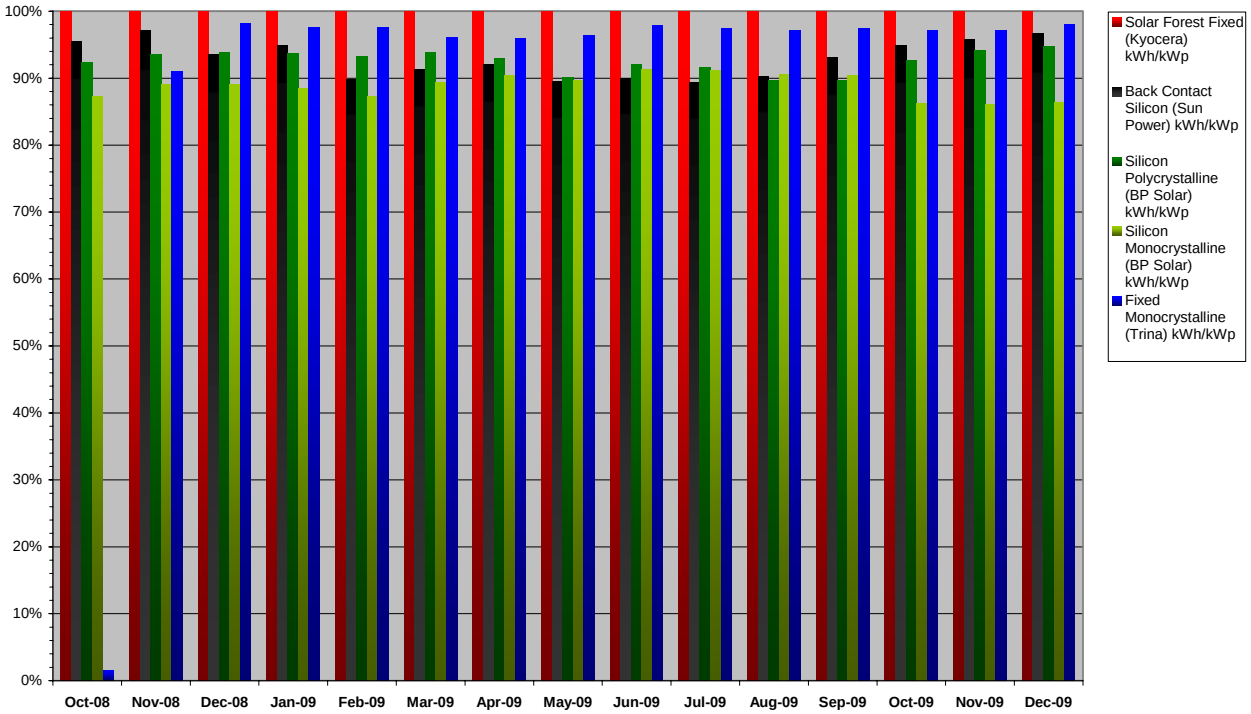
Graphs 3 and 4 indicate system performance over the months in which only operational data has been used. Instead of averaging the total kWh generated and dividing it over the number of days in the month (as in the previous graphs), the monthly average has only been calculated on the data from systems which where operational for full days in the month, e.g. if there was 15 days of operational data for the month, then the monthly average would be calculated from the 15 days total kWh generated for the month and divided by 15. This was done to provide a better representation of each systems performance.

Graph 3: Average per month AC kWh / DC kWp (working days data)



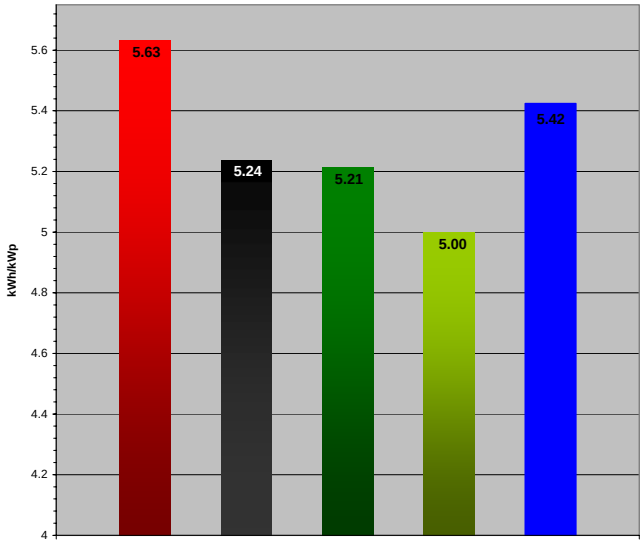
Graph 4:% of the maximum average AC kWh per DC kWp per month (working dys data)

Again, for each month in this graph, the system with the maximum average kWh/kWp has been used to baseline the result for that month.



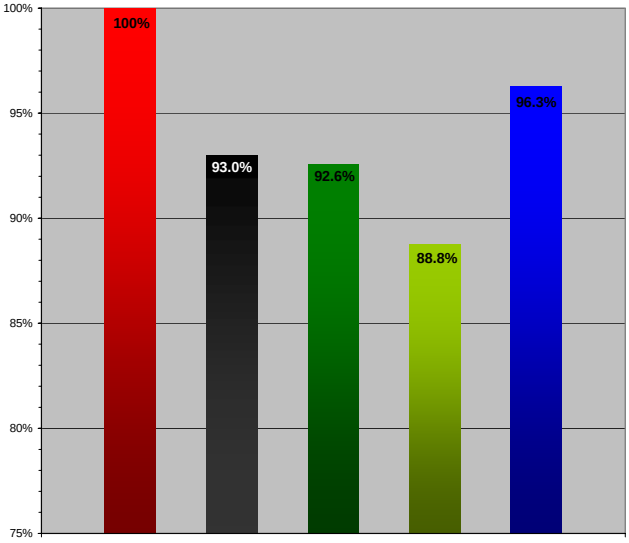
Graph 5: Average kWh/kWp Oct 08 to Dec 09 (working days data)

This graph indicates the average kWh/kWp from the 1st October 2008 until the 31st December 2009.



Graph 6: % of the maximum average kWh/kWp kWh/kWp Oct 08 to Dec 09 (working days data)

Again, the system with the maximum average kWh/kWp has been used to baseline the result for the time period.



Conclusion

For each month of data, a comparison of the AC kWh per DC kWp of all systems can be made. From these results it can be concluded that the Kyocera system has consistently produced or generated on average, a higher AC kWh per DC kWp performance. While this is only 14 months worth of data, a trend is emerging on the performance of the Kyocera system in terms of energy yield, i.e. generating more energy for each kilowatt of solar modules installed.

These specific outcomes we believe demonstrate that a quality built product will deliver a premium output performance in terms of kilowatt hours generated per kilowatt of peak installed capacity. We believe that energy yield is an important expansion to the discussion beyond the importance of solar cell and module efficiency.