

## Re: Solar electric at 50% efficiency?

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"Alex" <[alexterrell@xxxxxxxxxx](mailto:alexterrell@xxxxxxxxxx)> wrote in message  
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Just a thought ...

Has anyone tried using solar thermal power as a pre-heater for thermal power stations (gas or coal?)

Imagine a 20 Hectare solar collector field supplying about 200MW of heat. This is used to preheat air and natural gas, prior to combustion in gas turbines.

Input: 200MW solar and 800MW gas  
Output: 500MW electric

Advantages:

- The heat is converted to electricity at an effective efficiency of that of the plant, about 50% for gas turbines.
- The circulatory fluid is only heated to about 200-300C - quite manageable with limited losses
- The heat can be stored in a molten salt and released when there's no sun

Any problems with this?

For openers 20 hectares would see a peak power of 200MW with an insolation of 1,000 Watts/sq M. That's peak, full sunshine. Averaged over a 24 hour period, the insolation would be about 40MW. Secondly, the collection efficiency would never be 100% so only about 30MW of average heat would be available for preheat.

It would require storage as you mentioned. To get to 200MW average, it would take about 130 Hectares. And, as was mentioned it would be low grade heat. At best it could only add a few percentage points to the efficiency of the plant.

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