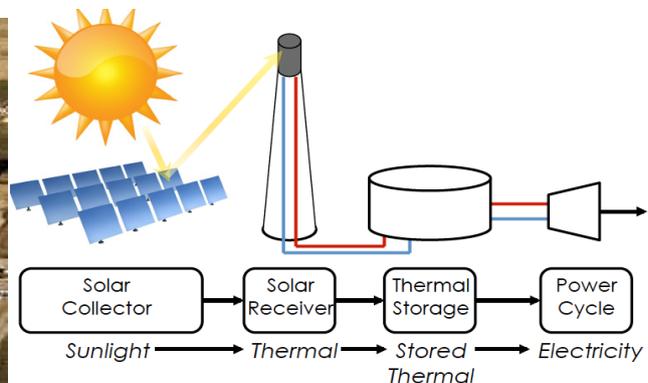


Concentrated Solar Thermal (CST)

**A unique opportunity for South Australia:
Good for Health, Energy Security and Manufacturing**



Advantages of CST for South Australia

- ✓ 24 hour baseload renewable energy with free fuel - cheaper electricity
- ✓ No more air pollution from coal –no adverse effects on community health
- ✓ 5 million tons reduction in CO₂ emissions - helps SA achieve its carbon emission target
- ✓ Cheaper energy long term - more permanent regional jobs and manufacturing compared with coal or gas
- ✓ Modern technology - increased skill acquisition and employment for the state
- ✓ Builds on invested experience in solar thermal technology at the Australian National University
- ✓ Mirrors could be manufactured at the Holden plant – a future export product with global demand

What is CST?

- Advanced “off the shelf” commercially available, power-generating technology, with almost 40 plants operating and 20 more under construction, worldwide ⁽¹⁾.
- Mirrors concentrate the sun’s energy onto a central tower, heating water to power turbines or enabling storage of energy in liquid salt tanks for use at night.

Benefits of CST

- Rising fuel prices, health costs from pollution and future global emission trading schemes will further increase the cost of gas and coal from today’s prices and make **CST a cheaper alternative**. Cost-analysis by the CSIRO shows CST soon to be cost-equal, if not cheaper, than wind or coal.
- Based on today’s values and prices, the cost for building the solar thermal plant will be **repaid in 20 years** by the money saved from not buying fuel for the same power output.

An Opportunity vs Ongoing Pollution

- The Playford B and Northern power stations in Port Augusta are some of the oldest and most polluting brown coal power stations in Australia.
- They are supplied with brown coal from Leigh Creek, a resource that is now being depleted.
- CST with wind turbines would prevent the emission of roughly 5,000,000 tonnes of CO₂ per year, and save up to 20 million kg in emissions of Sulphur and Nitrogen Oxides (NPI data 2009/2010). [In contrast, the annual emissions from a new Combined Solar Thermal-Gas Turbine would be 2 million tonnes of CO₂ per year, without accounting for fugitive emissions from gas mining.]
- Ideal sun and wind conditions apply at Port Augusta. Feasibility and cost accounting models already exist (BZE 2011/12). CST is ideally suited to work in combination with wind energy and solar PV.
- 1.5MW solar tower is already being built in Port Augusta for commercial businesses. CST is viable.

Health

- International studies show that communities living near coal mines and coal fired power stations are exposed to a range of air pollutants, resulting in an increased incidence of diseases of the heart and lungs and significant rates of premature death ⁽²⁾.
- There is an increased incidence of lung cancer in adults and higher incidence of respiratory illness in children in the residents of Port Augusta ⁽³⁾.
- Gas power plants also emit fine particulate pollution with some health risks. (*Environ Health Perspect*; DOI:10.1289/ehp.122-A27)
- Taking health costs and other externalities into account, the real price of coal mining and power generation is double, if not triple, our electricity prices ^(2,4).
- Climate Change represents the biggest health threat of the 21st Century ^(2,4), and fossil fuel burning is by far the biggest single driver. Reductions in carbon emissions through burning less coal are an effective, urgent and important health measure.

Jobs and Manufacturing

- There would be 360 direct permanent operational and maintenance jobs created with an additional 1,300 (approx) construction and 225 manufacturing jobs. ⁽¹⁾
- Power plant workers from the existing plant can also be re-skilled because the same or similar steam turbines will be needed ⁽¹⁾.
- In the long term, cost reductions due to CST power will recruit industries to South Australia.

Technical specifications

- The Playford B and Northern power stations in Port Augusta could feasibly be replaced by 6 solar thermal towers (760 MW) and 95 wind turbines (700 MW).
- Each CST module would consist of a 180 metre high tower, surrounded by a mirror field extending a kilometre from the tower.
- Each plant would deliver 480GWhrs to the grid annually. The plants have a 2 year construction timeline once the mirrors are produced (possibly at a retrofitted Holden car plant).
- A *site-specific feasibility study* for a single 50 MW plant with 15 hours storage (ARENA and Alinta) is currently under way with an outcome expected in 2015. This represents a long, costly, delay.

South Australia has ideal wind and sun penetration. Communities are suffering the health impacts from coal burning and SA needs manufacturing now. To delay building CST has a real risk of depriving SA of a "win-win" opportunity and condemning communities to more coal pollution for decades.

References

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