

Making the case for CSP in SA's energy mix



By Siyabonga Mbanjwa

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The government's Integrated Resources Plan (IRP) of 2010 stated that about 18,000MW (17% of South Africa's energy mix) of new electricity capacity needs to be in the form of renewable energy, in line with South Africa's international commitment to reduce its carbon emissions by 34% by 2020 and 42% by 2025. In the past few months, the role of renewable energy has become a subject of intense debate, especially regarding the reliability and cost.



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However, innovation over the past few years has advanced solar energy technologies, particularly concentrated solar power (CSP). This uses molten salts to store energy that can be used at a later stage when there is no sun – a crucial enhancement of the value of solar power in the mix.

Job creation

CSP should be taking off in South Africa. It speaks to the key initiatives envisaged by the National Development Plan (NDP), it's clean and contributes to the creation of the green economy. It also has the potential to create much-needed jobs.

In South Africa, the value of this technology is still not fully appreciated, given that apart from its energy attributes, there is also the benefit of industrialisation, localisation and job creation.

Industrial development and establishing a new green economy are key initiatives stipulated in the NDP for job creation. CSP offers an excellent opportunity to achieve these objectives.

The [Green Jobs](#) report released, jointly by the IDC and DBSA estimated that renewable energy has the potential to create 130,000 new direct jobs by 2025. The report said these jobs could be generated through the construction, installation and manufacturing of plants and equipment, as well as in operations and maintenance.

CSP excluded from Base Case

The recent exclusion of CSP from the new draft [IRP Base Case](#) presents an opportunity for stakeholder engagement to demystify concerns around the technology and to unlock its potential. This is a route that the department of energy has embarked on through its IEP/IRP stakeholder consultation workshops, for which they should be lauded. We should all work together in realising a well-balanced energy mix for the country.

Cost includes storage and dispatch

The cost of CSP does seem higher than competing technologies, judging by the latest bids that have been submitted to the department of energy. However, CSP has additional and distinctive benefits as already highlighted above. Some of the fundamental differences between the cost of CSP and other technologies is that the cost of CSP already takes storage and dispatch-ability into account whereas some technology costs don't.

If the costs of storage and dispatch-ability had to be added to the cost of other technologies then the cost of CSP would be more affordable.

Some of the assumptions that have gone into the model used by the department of energy to develop the IRP Base Case that has been issued for public comment are not up to date and are higher than market related rates. The average costs from the latest bid windows of the REIPP procurement programme should be used. The Base Case also does not take into consideration the further cost reductions that are envisaged for CSP from now until 2050.

With the anticipated construction of CSP plants throughout the world (particularly in areas such as Morocco, Chile and Dubai) and the amount of research and development that is going into this progressive technology cost reductions going forward should improve on the cost-reduction trajectory that has already been experienced in South Africa from 2011.

Costs expected to drop

The International Renewable Energy Agency (IRENA) released a report entitled [The Power to Change](#) noting that costs of CSP could drop by as much as 43% by 2025.

CSP technology uses various mirror configurations to concentrate the sun's light energy onto a receiver, converting it into heat. The heat is then used to create steam to drive a turbine that produces electrical power.

CSP plants then integrate thermal energy storage systems to generate electricity during cloudy periods or even several hours after sunset, thus extending its capacity, and adapting its generation profile to the actual demand curve as required.

With this in mind, we believe that CSP has a place and a significant role to play in the country's energy mix. Comments on the draft IRP's Base Case and Assumption can be made to the department of energy until the end of March 2017.

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