

Combined cycle gas turbines (CCGT)

The most common combined cycle gas turbine (CCGT) power plants recover and reuse hot exhaust gases to utilise residual heat energy and to generate additional electricity.

South Africa does not currently have any CCGT power plants. The Integrated Resource Plan (IRP 2010) provides for the installation of 2,370 MW of CCGT to be built by 2030. CCGT plants can be fuelled by diesel or natural gas. In the 2050 Calculator natural gas is the supply fuel.

Level 1

This level assumes no CCGT capacity is installed in the country from now to 2050.

Level 2

Level 2 assumes that CCGT installed capacity increases as per the IRP 2010 to 2,370 MW in 2030 and that this doubles to 4,740 MW by 2050.

Level 3

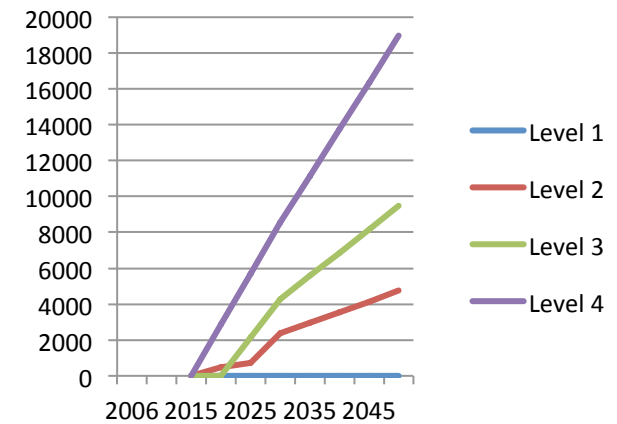
Level 3 assumes that South Africa installs 4,266 MW of CCGT capacity by 2030 as per the IRP 2010 'Adjusted Emissions Scenario'. This then doubles to 8,532 MW by 2050.

Level 4

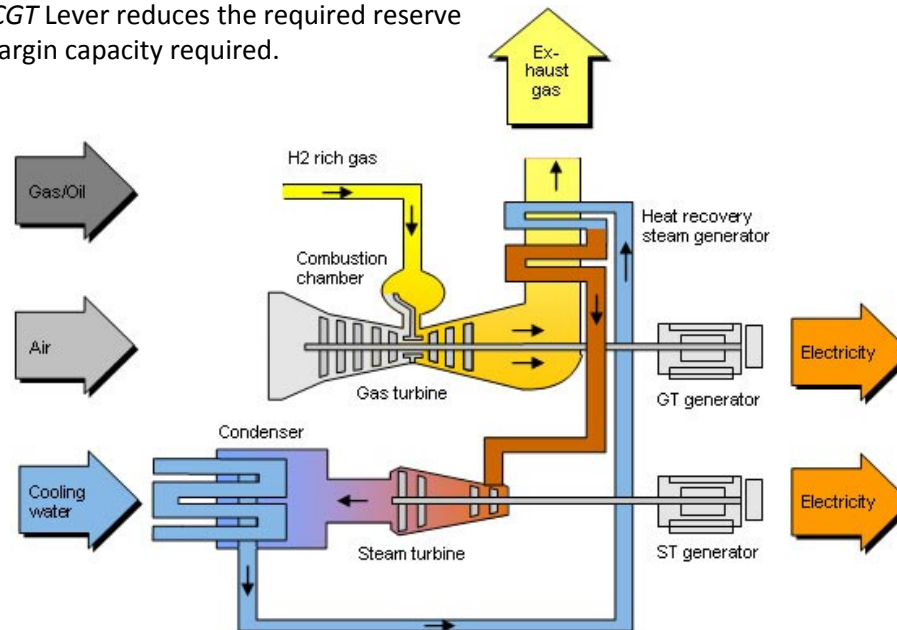
This level assumes that CCGT capacity is rapidly installed (at twice the rate in Level 3), 8,532 MW is installed by 2030 and 17,064 MW by 2050.

Interactions

In the Calculator model, to keep the reserve margin for electricity demand at 15% throughout the period to 2050, CCGT capacity is added based on the expected reserve margin deficit in the model. The CCGT Lever reduces the required reserve margin capacity required.



Installed CCGT capacity (in MW) in Levels 1 to 4



Source: <http://www.powergeneration.siemens.com/products-solutions-services/power-plant-soln/combined-cycle-power-plants/>

Schematic diagram of how a CCGT plant operates