

Pulse Combustion driven Thermo-acoustic refrigeration system (PUTAR)

100+*% GREENHOUSE GAS REMOVAL from existing power station Boilers

The refrigeration processes is powered by Delafield's Thermo-acoustic pulse combustion. This enables a very compact and efficient "engine" at one end of the pulse tube that forms the thermo-acoustic refrigerator. Modifications to the cold end of the pulse tube further improve the efficiency of this refrigerator.

The combustion products and flue gases from the boilers are fed into a series of heat exchangers and are cooled down by the returning remnant gases from the refrigeration process. Water, SO_x and NO_x present get condensed out of the flue gas stream as individual components, i.e. the NO_x is collected as N₂O, NO and NO₂ separately.

CO₂ is collected as a solid and fed into a series of chambers where it is allowed to pressurise and go into the liquid phase ready for transfer to a sequestration process. The pressurisation process can be assisted with steam earmarked for the condensers in power stations thus saving on cooling water requirements. Also, power station operators no longer need to keep the flue gases above 200 °C to prevent condensation in the chimney stacks and can therefore recover more heat from the fuel.

*The exiting gases now have only about 270ppm of CO₂ as opposed to around 400ppm of CO₂ in the incoming combustion air.

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PROCESS DIAGRAM

