

IMPROVING THE EFFICIENCY AND PERFORMANCE OF SMALL SCALE COMBUSTION PLANT FOR INCREASED EXPORT OPPORTUNITIES

OBJECTIVES

This proposal is concerned with improving the design, efficiency and environmental performance of low-grade coal burning appliances – commonly used in China, India and the former Soviet Union (FSU) – which produce unacceptable environmental pollution mainly in the form of particulate emissions. In the initial draft of the small combustion plant directive limits for particulates are set at 150 mg/m³ for boilers less than 10 MW, and 50 mg/m³ for those between 10-50 MW. These suggested figures raise considerable challenges for industry. Our objectives are therefore:

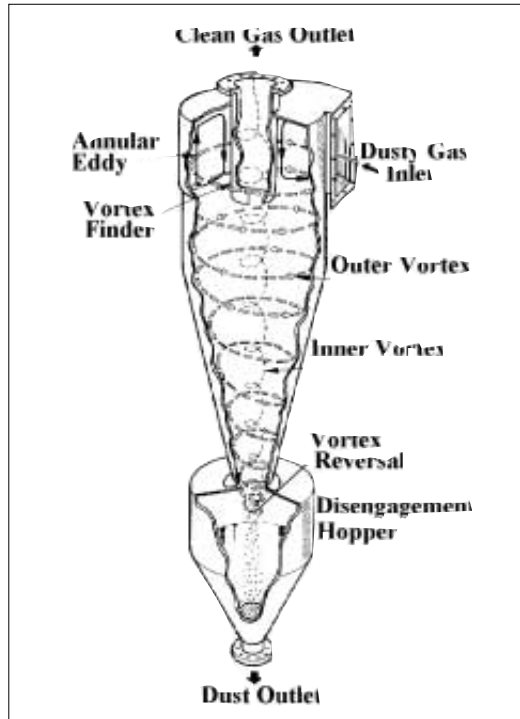
- to develop a high efficiency cyclone grit arrestor suitable for retrofitting to existing coal fired boilers
- to develop a technology suitable for countries burning low grade coal particularly India and China, thereby increasing export opportunities
- to develop a system for equipment burning low grade coal which drastically reduces particulate emissions, thereby improving environmental performance

SUMMARY

The boilers which we are considering in this proposal are 600 kW - 6.5 MW. Bag filter technology is available but when applied to smaller boilers the costs outweigh the benefits.

CRE Group Ltd has been working on the design of a high efficiency cyclone grit arrestor, which, if successful, would be the answer to the problem of particulate collection on small boiler plant. James Proctor Ltd is installing a 1 MW smoke tube boiler fitted with a chain grate stoker in its factory. It is intended to fit the cyclone grit arrestor to the plant in order to test this type of back end clean up on a variety of coals. If these tests prove successful, Proctors would manufacture the system under licence from CRE for retrofitting to any existing boiler plant in Europe and indeed anywhere else in the world. This would establish real and significant opportunities for the UK within these countries. The number of existing boiler plants within this range runs into tens of thousands, so the environmental benefits are clear.

For new boiler plant the successful particulate and emission reductions would enable coal to be a viable fuel for heating and process applications in the smaller range of boilers. In countries such as India, China and the FSU that currently burn low-grade coal as their primary energy source, the impacts of this work could be essential to its future use.



Typical view of a tangential entry and scroll outlet cyclone

COST

The total cost of the project is £149 790 with a contribution of £50 000 from the Department of Trade and Industry (DTI)

DURATION

2 years – December 2000 to December 2002

CONTRACTOR

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