TECHNOLOGY FACTSHEET

SUPER BOILERS [1]

1. **Sector/ Sub Sector:** Industry thermal energy application

2. **Introduction:** This is a novel flue gas heat recovery system with specialized controls to maximize energy efficiency and maintain stable performance under industrial conditions.

3. **Technology Name: Super Boilers**

4. **Technology Characteristics:** The Super Boiler uses heat recovery from flue gas to increase energy efficiency and state-of-the-art combustion to reduce emissions. The boiler is capable of a 93-94% fuel to steam efficiency conversion, while releasing less than 9 ppmv (parts per million by volume) of NOx.

   The Forced Internal Recirculation (FIR) Burner combines staged, premixed combustion with forced internal flue gas recirculation to minimize the formation of both thermal and prompt NOx. The burner's unique design provides excellent flame retention for stable combustion at low emission levels. The FIR Burner is applicable to a wide range of water tube boilers. This revolutionary burner design promises increased system efficiency, NOx emissions below 9 vppm, CO emissions below 50 vppm, and total hydrocarbon (THC) emissions below 50 vppm.

   Ultra-Low NOx burners achieve ultra-low NOx emissions by combining a unique type of clean-burning combustion technology called ultraclean, low-swirl combustion (UCLSC), with premixed flames. High energy efficiency is achieved in this type of combustion because the appropriate ratios of air and fuel are mixed to burn completely. In addition, the characteristically lifted flame of the burner provides for highly efficient heat transfer because no heat is transferred from the flame to the burner.

   Ultra-Low NOx Burners emit 10 to 100 times less nitrogen oxide than conventional burners. Also, the cost of these burners is comparable or lower than that of many conventional burners.

5. **Country Specific Applicability:** Applicable in Sri Lanka

6. **Status of the technology in the country and its future market potential:** -

[1] **This fact sheet has been extracted from TNA Report – Mitigation for Sri Lanka. You can access the complete report from the TNA project website** http://tech-action.org/

7. **Barriers:** -

8. **Benefits:** 13% fuel saving

9. **Operations:** -

10. **Costs:** -

11. **Reference:** US Department of Energy. Energy Efficiency & Renewable Energy