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**UNIDO**

**Energy Conservation and Greenhouse Gas Emissions Reduction in Chinese  
Township and Village Enterprises—Phase II**

**Technical Renovation for Energy Efficiency at Yongxing Shale Brick Company  
Ltd.**

**Contract No.04/163**

## **Completion Report for the Project**

**Beijing Lideheng Environmental Protection Engineering Co., Ltd.**

**April, 2005**

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## I. Overview of Final Effect of the Project

After the whole production line was put into operation on March 5<sup>th</sup>, 2005, by several adjustments, the production line has already produced acceptable Air bricks. By April 12<sup>th</sup>, 2005, we have produced one after another by the rebuilt production line 3-hole Air bricks (porosity is 48%), 8-hole Air bricks (porosity is 45%) and traditional porous bricks, all are satisfactory. By loaded production running, we have made summarization together with Yongxing Company on the effects of technical reconstruction of the production line, generally they are:

1.1 After reconstruction, the overall performance of the kiln was highly improved. According to actual operation, the calculated average fire running speed has increased 20%, thus the output has increased 20%, meanwhile the coal consumption has dropped 23%, and has achieved the predetermined target for technical reconstruction, i.e. the comprehensive coal consumption for every 10 thousand bricks (converted into standard bricks) has decreased from 1.2t to 1t.

1.2 The effects for updating and reconstructing the production line mainly reflected by:

(a) The grain size of broken crude material has been improved greatly.

Before the reconstruction, in the broken material, the coarse particules  $\geq 2\text{mm}$  account for about 15%, and the fine particules  $\leq 0.05\text{mm}$

account for only 50%; while after the reconstruction, they account for about 5% and 70% respectively. This has provided reliable guarantee for improving product quality and increasing product varieties.

(b) The drying quality of brick blanks has greatly improved. Before, the dried bricks have somewhat drying cracks, the reject rate for dried bricks is 2~3%; and after the technical reconstruction, the drying cracks in blanks disappeared, and the qualification rate for dried brick blanks is 100%.

(c) The compactness of blanks and finished bricks has greatly improved. Just take the traditional porous bricks as an example, the weight of both blanks and finished bricks are 0.25~0.30kg more than that before, this has fully reflected the usefulness of improvement in grain size of crude materials and hard-plastic extruding for product quality.

(d) The productivity of the whole production line has greatly improved. Before the technical reconstruction, being influenced by the aged equipments of the production line and so many un-matching factors, the working time for each shift (2-shift per day) is not less than 8h, sometimes it is even up to 10h; after the reconstruction, it only takes 7h for each shift to complete the task, this has greatly saved electric power and labor.

1.3 It has preliminarily achieved the target for increasing product

varieties. Being limited by time, up to now the rebuilt production line has only produced two new types of bricks: 3-hole Air bricks (porosity 48%) and 8-hole Air bricks (porosity 45%). Both types are highly demanded by market at present, and on the former production line they have been tried several times but failed. It is believable that in future more new types of bricks will be produced on the rebuilt production line, so as to make continuous contribution for meeting market demands.

1.4 The effect of “energy conservation & emission reduction” is obvious for the Project.

(a) On basis that the comprehensive coal saving is 23% and the reject rate will decrease 5% for the reconstructed production line, in future it will save at least 2350t (converted into standard coal) coal each year.

(b) Although the updated and newly-added equipment have newly increased 243.4kW power, as the production line’s efficiency has improved, the actual running time per day has reduced about 20%, therefore the actual power consumption for the line each day is almost equal to that before, and it has not increased the power consumption.

(c) Suppose it saves standard coal 2350t yearly, it can reduce the emission of SO<sub>2</sub> at least 10t above, meanwhile it can greatly reduce the emission of CO and CO<sub>2</sub>.

## 2. Management Measures after Establishing the Project

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In order that the Project can reach to the target of “energy conservation & emission reduction” in a long term steadily, we have carried out discussion and exchange with the main managements from Yongxing Company after establishing the Project. We have put forward some advices for management systems concerning the requirements for “energy conservation & emission reduction”, and have drafted the “Management Systems for Energy Conservation & Emission Reduction”, which the main managements from Yongxing Company have discussed carefully and have supplemented and modified based on the actualities.

### 3. Conclusion for Completion of the Project

(a) We have performed and completed all stipulated works according to 04/163 Contract with the Industry Development Organization of the United States as well as the concrete requirements in the Contract Appendix “Time Schedule for Implementing the Project Task”.

(b) The final results after completing the Project are satisfactory, have reached and surpassed the predetermined indexes in the *Feasibility Study Report for the Project*, and have been recognized overall by Yongxing Company.

In future actual production, we’ll continue to provide Yongxing Company with all-sided technical support and thoughtful service, and make our due contribution to the global “energy conservation & emission reduction”.

## 4. Appendix

(a) Management System for Energy Conservation & Emission Reduction  
for Sichuan Yongxing Shale Air brick Co. Ltd.

(b) Relative Pictures from the Project



## **Appendix I**

### **Management System for Energy Conservation & Emission Reduction for Sichuan Yongxing Shale Air Brick Co., Ltd.**

**By technical reconstruction for energy saving & emission reduction in recent years, at present we have achieved and reached the predetermined purpose and requirement. The following managing system is hereby made up so as to guarantee the sustainable development and improvement for energy saving & emission reduction.**

- I. The management of energy saving & emission reduction is at responsibility of CEO, its implementation is at responsibility of vice production manager, its supervision & check is at responsibility of the director of the Quality Inspection Office, and will be listed in and examined by the annual target plan.**
- II. To make up various controlling indexes and controlling points for energy saving & emission reduction, which will be checked and recorded regularly every 10 days by the Quality Inspection Office.**
- III. To set up a full-time manager and inspector for crude coal and electric power, and assay each truck of warehouse-in crude coal, assay each shift the internal-combustion coal. To**

compensate the electric capacity at start and terminate end (power factor  $\geq 0.95$ ), combine real-time with scientific power consumption, set up and perfect full-day inspection report and daily records.

- IV. To hold regularly each month an analysis conference for energy saving & emission reduction participated by relative persons who are team leaders and above. To make sub-summarization once every half year, and general summarization at each year end. To set up and perfect various quality management systems and awarding systems.
- V. To manage at different tiers the raw materials and forms, i.e. to monitor and record by persons specially the grain size of raw material, moisture of form, extruding density, vacuum and hollow rate, etc.
- VI. To enhance the air temperature controlling for the drying room, and utilize optimally the heat energy. (Porous brick  $\geq 120^{\circ}\text{C}$ .  
Air brick  $\leq 100^{\circ}\text{C}$ )
- VII. To monitor by infrared the kiln's temperature, the baking high-temp zone should be controlled within  $105^{\circ}\text{C}$ . To combust and utilize to most the crude coal, and guarantee that the color evenness of product will be up to 98%.(yield of finished

**product: porous brick 98%, Air brick 97%)**

**VIII. The breakage rate in the drying chamber is controlled to be 1-2%.**

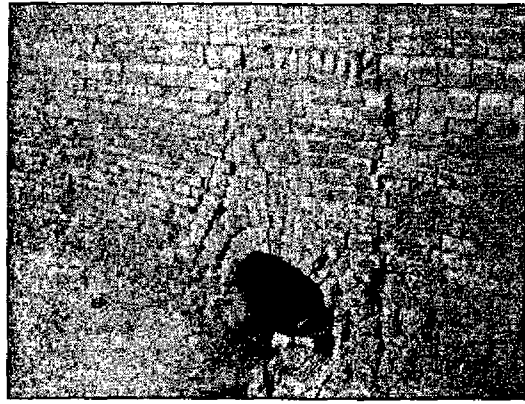
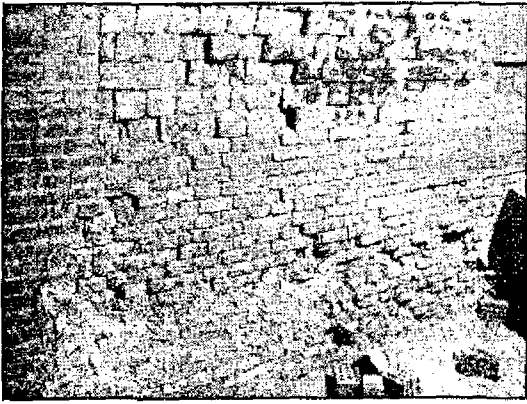
**IX. The water content in dried brick blanks shall be controlled to be less than 5%.**

**X. The water content entering into the kiln will be controlled to be less than 5%.**

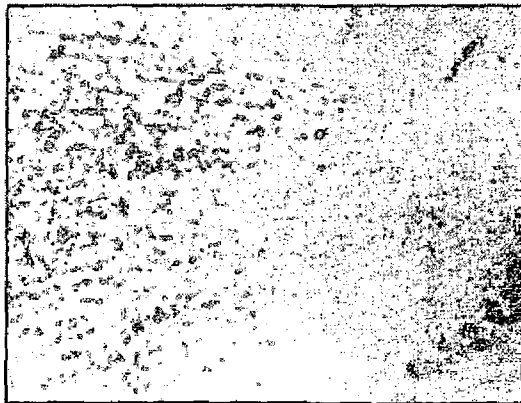
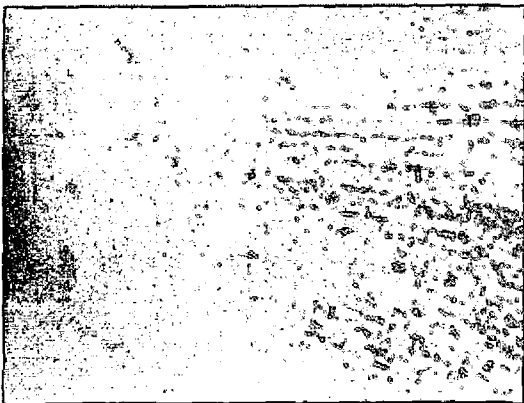
**Sichuan Yongxing Shale Air Brick Co., Ltd.**

**April 20<sup>th</sup>, 2005**

**The kiln before technological transformation:**



**The kiln after technological transformation:**



The production line after technological transformation:

