**Project Summary**

**Project Background**
The Chinese Government has nominated the city of Tangshan to conduct a comprehensive refurbishment project within its residential areas. Since 2010 the energy saving refurbishment project is on-going. It comprises residential buildings with a total area of approximately 30 million m². To date, approximately 20 million m² have been refurbished by the municipality of Tangshan. Thereof 4 million m² have undergone a full refurbishment comprising the rehabilitation of the existing heating systems and the insulation of the walls and roofs (7-10 cm insulation layer). In the remaining 16 million m² only the heating systems have been refurbished. In addition to these projects a total of 210 urban residential buildings with a total gross floor area of 760,400 m² shall be energetically refurbished under the Sino-German EEB project.

**Project Objectives**
INTEGRATION as an internationally recognised, experienced and independent Consulting Company specialized in design, construction and construction surveillance of energy efficient building rehabilitation has been assigned to assist the Tangshan Affordable Housing Project Investment and Construction Co. as the Project Executing Agency (PEA) to implement the EEB project during February 2013 to December 2014 according to international (quality) standards. The international Consultant shall provide guidance and support in proper implementation of energy efficiency measures.

**Project Results**
The emphasis is on improving the building envelope and the in-door heating systems. The standards to be applied are as follows:
- exterior wall insulation 12 cm, $\lambda = 0.042$ W/mK
- roof insulation 14 cm, $\lambda = 0.033$ W/mK (material XPS)
- tilt and turn windows $U_W = 2.0$ W/m²K; $SC = 0.65*$; heat protection glass with air gap (*$U_W = 2.0$ including frames)
- heat insulated and self-closing building entrance doors
- automatic temperature control for each apartment
- heat metering per apartment as precondition for consumption based billing
- refurbishment of building heating system
- basement insulation: Calculation of the dew points of basement and cellar walls.

**Services Provided**
- Project preparation: Assess detail drawings and tender documents; Assist and monitor tendering process.
- Assistance during implementation: Explanation on EE components and materials; Review comply of material with standards; Review time schedule; Provide on-the-job trainings and on-site construction supervision; Participate in acceptance of works; verify construction quality of the EE measures; Check invoices of suppliers and confirm compliance with the contracts and loan agreement.
- Final Review, Quality Control and Verification: Review and assess completeness of operation and maintenance arrangements; Assess adequacy of budget allocation to cover maintenance and operational costs; review supervision procedures.

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**PR China**

**Energy Efficient Refurbishment of Residential Buildings (EEB) in Tangshan**

**Client**
Tangshan Affordable Housing Project Investment and Construction Ltd.

**Duration**
04/2013 - 12/2014

**Personnel**
- 4 internat. STE (11,5 PM, Team Leader, Architects)
- 7 national STE (29 PM)