



**Service/Product Provider**

***Armstrong International, Inc.***

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Business: Steam, Air & Hot Water Utility Systems

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**Industrial Partner**

***Pepsi Americas***

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Business: Beverage Bottling

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**Armstrong's Complete Thermal Exchange (CTE) technology reduces natural gas consumed by Pepsi Americas by 37% and reduces CO<sub>2</sub> emissions by 4,125 tons/year**

**Project Scope**

Using CTE technology, Armstrong designed, engineered, and turnkey installed Flo-Direct gas-fired hot water heating systems to complete can/bottle warmer optimizations on thirteen production lines at eight Pepsi facilities.

**Project Summary**

Armstrong provided facility and system assessment, energy analysis, the Flo-Direct product, project costing design, project management, operational commissioning, personnel training, final inspection, and closeout documentation as part of this project's turnkey service.

- **Energy Savings**  
Reduced natural gas consumption by an average of 37% and CO<sub>2</sub> emissions by 4,125 tons/year
- **Water Reduction**  
Flo-Direct recovers "free water" at the rate of over 30 gallons/hour or 1,217,000 gallons/year
- **Investment**  
\$1,632,838
- **Financial Return**  
Less than 3 year simple payback, 21% IRR
- **Other Benefits**  
Increased warmer water tempering efficiency, improved warmer capacity and productivity, and reduced heat wasted by eliminating inefficient heat generated throughout the facility. Facility now heats only the locations requiring heat during the heating season. The turnkey project provided single source responsibility and risk management while ensuring project completion.

**Monitoring & Verifying Energy Savings**

Monthly natural gas utility bills are monitored, and savings are at or better than planned. Mechanics' repair orders and preventative maintenance time have been reduced by 70% on average for affected areas.

**Distinguishing Value**

Pepsi has experienced an overall quality install, documentation, follow-up, and consistent performance of the CTE/Flo-Direct installations in the eight facilities. Due to the very favorable result, the Armstrong Flo-Direct is now a standard for warmer optimizations and quality performance criteria.