

LITE Manufacturing system - ISA Leather

China

June 2012

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Resource efficiency in leather industry

In China, the Low Impact to Environment (LITE) classification system is helping the leather manufacturing industry to take efficiency measures in the planning and design phase, thereby achieving significant improvements in water and energy efficiency whilst reducing the overall environmental impact.

China's leather industry at a glance

The world's major bovine and performance leather manufacturers have relocated to China and its neighboring low-cost production countries such as Vietnam, Thailand and India, making Asia the center of global leather production. Being the world's largest bovine, hides and performance leather producing country, China is also the world's leading trading partner of finished leather. According to 2010 national statistics, China's leather industry accounts for a gross industrial output of USD 115.14 billion, with an annual growth rate of 26.9 per cent.

By definition, China's leather industry is composed of various sectors ranging from leather and

Quick facts	
Sector	Leather industry in China
Topic	Sustainable production, resource efficiency, green technology
Policy	Low Impact to Environment (LITE) classification system
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Case Study



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fur as natural by-products to chemicals, machinery equipment, spare parts, components and commodities of footwear and apparels.

Since its WTO entry, China has undertaken several reforms, including the implementation of policies, market-based instruments, and institutional frameworks aimed at boosting industrial growth. Recent leather industry manufacturing data shows that the energy consumption per unit GDP has decreased by 44 per cent from 2007 to 2001. These statistics also show that the energy intensity per value adding unit has increased by 52 per cent during the same period.

In terms of environmental and clean-energy targets, the share of non-fossil fuel of the total primary energy consumption is planned to be at 11.4 per cent; water intensity per gross value added is targeted to be cut by 30 percent; energy consumption per unit of GDP is to be reduced by 16 percent and carbon dioxide emissions per unit of GDP are to be cut by 17 percent.

Energy and water efficiency are key to sustainability and profitability

In the face of risk perpetuated by climate change as well as the aftermath of the financial crisis, uncertainty persists in the business sector. Most

CHINA	2001	2003	2005	2007
Industrial output (USD/Yr)	18,999,991,449	27,462,602,724	52,055,577,150	67,796,351,183
Industrial Gross value added (USD/Yr)	4,733,113,733	7,141,448,130	na	19,475,159,616
Labor cost	649,474,155	2,495,568,114	4,129,882,610	5,414,160,808
Employment (USD/Yr/Person)	550,000	1,653,700	2,759,700	2,569,800
Energy Consumption (BTU/Yr x 1 000 000)	1,793,080	2,304,712	2,939,075	3,557,442

Figure 1 China Leather Industry, leading Industrial data, <http://www.stats.gov.cn>

The above numbers imply a productivity gain at scale and suggest that growth in China's leather industry was aligned with competition and expansion of global markets. However, it doesn't appear to differentiate between sector-specific energy intensity per service unit. Hence, the potential for concern over the extent of improvement required by China's leather industry in regard to energy, water, and material productivity as a whole is introduced.

China's 12th five-year plan: key industrial targets

China's 12th five-year plan has outlined economic reforms including a low-carbon development strategy, with a specific emphasis on industrial growth, and increasing domestic consumption and investment in emerging strategic industries.

The plan entails industry specific target rates, for instance, the service sector value-added output is to account for 47 percent of the GDP (up by four percentage points). To encourage innovation, expenditure on research and development is to increase to 2.2 percent of the GDP.

small and medium enterprises (SMEs) in emerging economies are hesitant to invest in greening their production. In the leather industry, as in many other industries, the initial step to eco-profits and business sustainability is to capitalize on opportunities generated from resource efficient manufacturing.

Energy and water are the major operating costs in the tanning industry. Very few tanneries are investing resources, time and money to improve their energy and water efficiency and waste management. Most tanneries take an "end of pipe" approach by increasing their waste water treatment capacities or installing air filters to filter emissions caused by the finishing equipment using cheaper spraying machines. The lack of vision hinders the technology innovation necessary to maximize operating efficiencies.

Remarkable resource efficiency

By applying best practice technologies, life cycle costing and appropriate management methodol-



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ogies, it is possible to reduce energy consumption by 75 per cent and water consumption by 50 per cent. Below are some simple examples on how to improve energy and water consumption levels:

- **Water Management:** to save water usage, wastewater can be reduced through a closed-loop re-use process, in which oil is recovered for use in feed lots, and steam is also generated. Remaining waste water can be cleaned using engineered wetland technology, which can also be used to produce and harvest biomass energy.
- **Equipment:** By swapping to a more efficient re-tanning vessel, a critical component of the tanning process, water consumption during production can be reduced by 50 per cent, and energy usage can be reduced by up to 75 per cent. There will also be a further reduction in chemical use, waste water volume and the treatment and waste disposal costs.
- **Finishing:** Conventional spraying machines require auxiliaries to dilute the chemicals before spraying them on the leather, and the spraying process is quite wasteful, causing the emission of chemicals into the air. On the other hand, direct coating application machines, which apply the chemical undiluted onto the surface of the leather, result in no air emissions and much reduced energy consumption during the drying process.
- **Drying of leather:** Leather can be dried on toggle dryers or on vacuum dryers instead of conventional dryers. Leather vacuum-drying technology has been improved over recent years and low temperature dryers are on the market. These dryers require less energy than conventional dryers.
- **Facility management:** Facilities can be designed as green buildings, in harmony with nature and integrated with local ecosystems. Industrial solar-hot water system and biomass energy generation can be installed to save energy costs.

The LITE leather classification in China

The LITE classification was developed to prove that significant improvements are with regards to the environmental impact of leather production. Several demonstration projects have been implemented since 2007 by the leather company Guangzhou Tan Tec Leather Ltd and its new plant Heshan Best Way Leather Ltd. in Guangdong, China.

The LITE classification was implemented as a pioneer project to provide more transparency for the customers. Based on monitoring and analysis of existing processes, it has triggered major reductions in water and energy consumption.

After the experience turned out to be a success, the company that implemented the classification invested more than originally intended into training and knowledge transfer. In doing so, the project can lead the way in replicating the LITE classification so that other industries or companies could improve their environmental management, facilities' energy-design, and the efficiency of their value chains by collaborating with suppliers and customers.

In today's business landscape, market prices do not reflect the full costs of processing inputs and outputs. While economic interests and share values drive business processes out of sustainable growth, the principle of the LITE classification is to embrace the business strategies of eco-efficiency and resource productivity. By sharing the net positive effects from its experimentation and creativity, the LITE classification supports customers in responsible sourcing and downstream green consumption; furthermore, it helps to transform re-industrialization through service innovations and the consequent multiplier effects so that business societies can bring about eco-profits by doing more with less.

References:

- <http://www.liteleather.com>
- http://www.crcet.com/english_index.htm