

# LY Steel (China)

Integrated energy management solution helps steelmaker  
DOUBLE efficiency and save US\$3 million annually!



## Case Study

### The Challenge

To provide an integrated solution that would help the customer conserve energy and reduce their massive expenditures on wind, water, electricity and gas used in the production of their steel products. They required a solution that would help them particularly with energy scheduling and provide them with the data necessary for effective decision making.

### The Solution

The reliability, flexibility and high performance of Schneider Electric's integrated SCADA and Historian solution suited the large scale of LY Steel's energy management solution.

They implemented a SCADA system comprised of six SCADA I/O servers, with 30,000 variables, 5,000 alarms, 3,000 trends, one Historian server and two SQL servers. Yet, despite the size of the system and the large number of tags, the observed response time remains less than one second.

### The Benefits

As a result of implementing Schneider Electric's solution, LY Steel reported a staggering 50% improvement in their energy efficiency and an even more dramatic 70% reduction in their maintenance costs!

The Historian component is helping them bridge the intelligence gap that existed between the plant floor and management, providing them with an accurate, long-term data management and reporting system.



LY Steel's manufacturing plant in Loudi City, China.

LY Steel (Lian Yuan Steel) was established in 1958 in Loudi City, a municipality of four million people located in the central Hunan province. Today, it is a major regional producer of sheet steel, with customers spread across China, Southeast Asia, Europe and the United States. It has an annual output of over 6.5 million tonnes, annual sales revenue of over US\$3 billion, assets greater than US\$3.5 billion and more than 15,000 employees.

The Lian Yuan plant covers more than 1600 square metres, accommodating the full scope of iron and steel manufacturing processes, from coking, sintering and smelting to rolling. They have won numerous industry awards, including three consecutive National Silver Medals and two national metallurgical Gold Cup Prizes for their Shuangling brand of hot-rolled ribbed steel bars (rebars).

### The Challenge

LY Steel's production process incurred enormous energy costs for electricity, water and gas consumption. They sought an integrated solution that would help them to conserve energy and reduce these expenditures. Improving their energy efficiency would enable LY Steel to enhance their competitive edge, meet their corporate and social responsibilities, as well as help them comply with strict national energy consumption and emission control regulations set forth for the steel industry by the National Development and Reform Commission.

LY Steel had already undertaken upgrades to their processes, equipment and technology to increase their efficiency, with remarkable results. Yet, when it came to energy scheduling and decision-making at the managerial level, they lacked an effective means

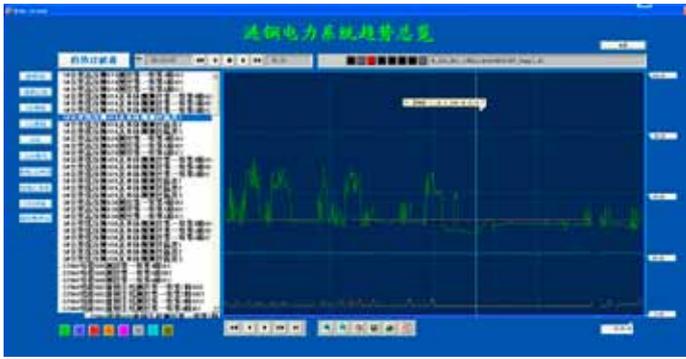
of visual analysis to manage and consolidate the comprehensive energy data. This lack of information transparency negatively impacted on their ability to formulate effective strategic planning.

### The Solution

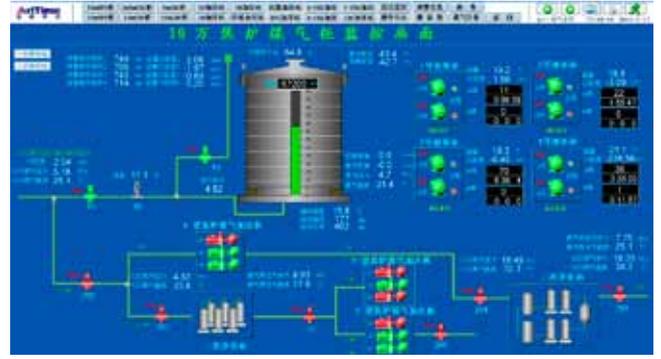
LY Steel found that Schneider Electric's energy management solutions (EMS) aligned well with their own critical needs. The reliability, flexibility and high performance of SE's integrated SCADA and Historian solution suited the large scale of LY Steel's EMS. They also relied heavily on Schneider's successful track record with energy management in the Chinese steel industry to help convince them that this was the ideal offer for their specifications.

Together with LY Steel's own technical support team, Schneider Electric's EMS specialists designed an integrated solution that included its SCADA and Historian software. They implemented a SCADA system comprised of six SCADA I/O servers, with 30,000 variables, 5,000 alarms, 3,000 trends and two SQL servers. Yet, despite the size of the system and the large number of tags, the observed response time remains less than one second, providing them with extremely high performance.

The openness of Schneider Electric's SCADA solution enables it to communicate with the many different hardware systems in use at their plant, including Siemens and GE-Fanuc PLCs, and electric meters which use special protocols, such as IEC-60870-104 or DNP#3. Such complex communication becomes simplified thanks to their SCADA system's open hardware interface. Its comprehensive, built-in redundancy was another key factor in ensuring them of a highly reliable system.



Electricity trend page.



Gas monitoring graphics page.

The Historian side of their integrated solution gives LY Steel access to important historised data and enables them to generate energy reports that provide valuable insight into their energy consumption patterns, as well as alarm reports and operation plan reports. This enhanced visibility and powerful reporting tool help them to determine ways and areas where improvements can be made to increase efficiency and reduce costs.

### The Benefits

As a result of implementing Schneider Electric's energy management solution, LY Steel reported a staggering 50% improvement in their energy efficiency and an even more dramatic 70% reduction in their maintenance costs. Furthermore, they have achieved a comprehensive savings of 4 yuan (about 60 US cents) per tonne of steel, or US\$3 million a year!

The Historian component is helping LY Steel bridge the intelligence gap that existed between the plant floor and management, giving them the information they required in a format they could use to make effective decisions concerning plant operations. It is providing them with an accurate, long-term data management and reporting system.

One of the most important benefits of the EMS solution, according to Wenyi Wang, project manager for LY Steel, is that it has enabled a change in their management concept from a decentralized management system to a leaner structure. "The state-of-the art automation technology facilitates energy management across our enterprise and has provided us with a professional and efficient diagnostic tool that helps us optimise our energy efficiency," says Wang. "LY Steel's production system is now among the world's most efficient and advanced systems," he continues. "In the future, we plan to continue to strengthen our technical cooperation with Schneider Electric through the continuous improvement of upper management functions of the EMS, with the goal of further reducing our energy costs and consumption by 70%-80%."

### Statistics at a Glance

<b>Real-time SCADA variables:</b>	<b>about 30,000</b>
<b>Advanced Alarms:</b>	<b>about 5,000</b>
<b>Historical Trends:</b>	<b>about 3,000</b>
<b>SCADA Display Clients:</b>	<b>13</b>
<b>SCADA I/O Servers:</b>	<b>6 (3x2 redundancy)</b>
<b>Historian servers:</b>	<b>1</b>
<b>Historian Interface:</b>	<b>SQL Native Client</b>
<b>SQL Server:</b>	<b>2</b>
<b>I/O Devices:</b>	<b>60</b>
<b>Serial Variables (Serial I/O):</b>	<b>35,000</b>
<b>Average response time as measured at SCADA:</b>	<b>1s</b>
<b>Observed response time:</b>	<b>1s</b>
<b>Observed time to call up a graphic page (with all display data) :</b>	<b>1s</b>
<b>Observed time to call up an historical trend page (with all display data):</b>	<b>1.2s</b>
<b>Network utilisation (measured at primary file server):</b>	<b>10%</b>
<b>I/O Server CPU Usage:</b>	<b>9%</b>
<b>Trend Server CPU Usage:</b>	<b>9%</b>
<b>Alarm/Report Server CPU Usage:</b>	<b>9%</b>
<b>Display client CPU Usage:</b>	<b>4%</b>
<b>PLC Brands:</b>	<b>Siemens, Rockwell, GE-Fanuc</b>



The state-of-the art automation technology facilitates energy management across our enterprise and has provided us with a professional and efficient diagnostic tool that helps us optimise our energy efficiency."

Mr. Wenyi Wang, Project Manager, LY Steel

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