



# **Supervisory Software is Critical Component in Sugar Cane Processing Efficiency**

*InduSoft*

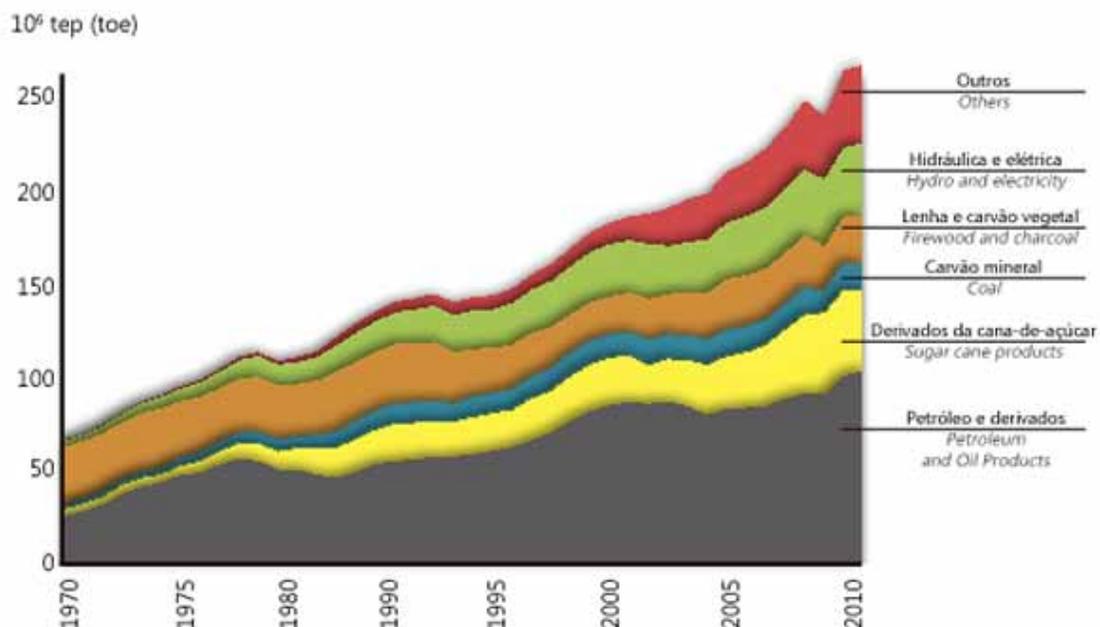
Brazil's ethanol industry holds incredible potential as a renewable source of energy that has already proven itself as an economic and environmentally sound method of producing sugarcane based fuel. Unfortunately, the sector has met with challenges that were not anticipated ten years ago. A large increase in the global supply of oil, climate change, and economic instability have forced Brazil's ethanol sector to search for technology that can offer a competitive advantage to petroleum based gasoline by making ethanol processing more efficient and cost effective. SCADA and HMI software that can increase the efficiency of ethanol production is one key solution for bridging the gap between petroleum and ethanol production cost, which enables sugarcane and ethanol processing facilities to meet market demands for production of biofuel at prices comparable to petroleum gasoline.

### Trends in Brazil's Ethanol Sector Suggesting Natural and Economic Challenges Ahead

The ethanol industry in Brazil is well-placed to succeed, and might very well serve as the case study worldwide for successful adoption of ethanol fuel for vehicles. Over 60% of the automobiles on the road in Brazil are flex-fuel vehicles that can operate on petroleum based gasoline, sugar based ethanol or a mix of both. By 2020, it is estimated that 80% of Brazil's cars will run on ethanol. The infrastructure is already in place to make ethanol the primary renewable fuel source for Brazil, which will severely reduce carbon emissions the country produces, and enable Brazil to become self-sufficient in fueling its industries.

Sugarcane energy products are not only in demand for automotive purposes. Ethanol is also used to generate electricity for major energy providers in the country, and demand is roughly equivalent to 800,000 barrels of oil per day.

Sugarcane is an attractive renewable commodity, as sugarcane plantation for energy uses account for less than one percent of arable land in Brazil, and sugarcane cultivation impacts biodiversity less than comparable agricultural practices.



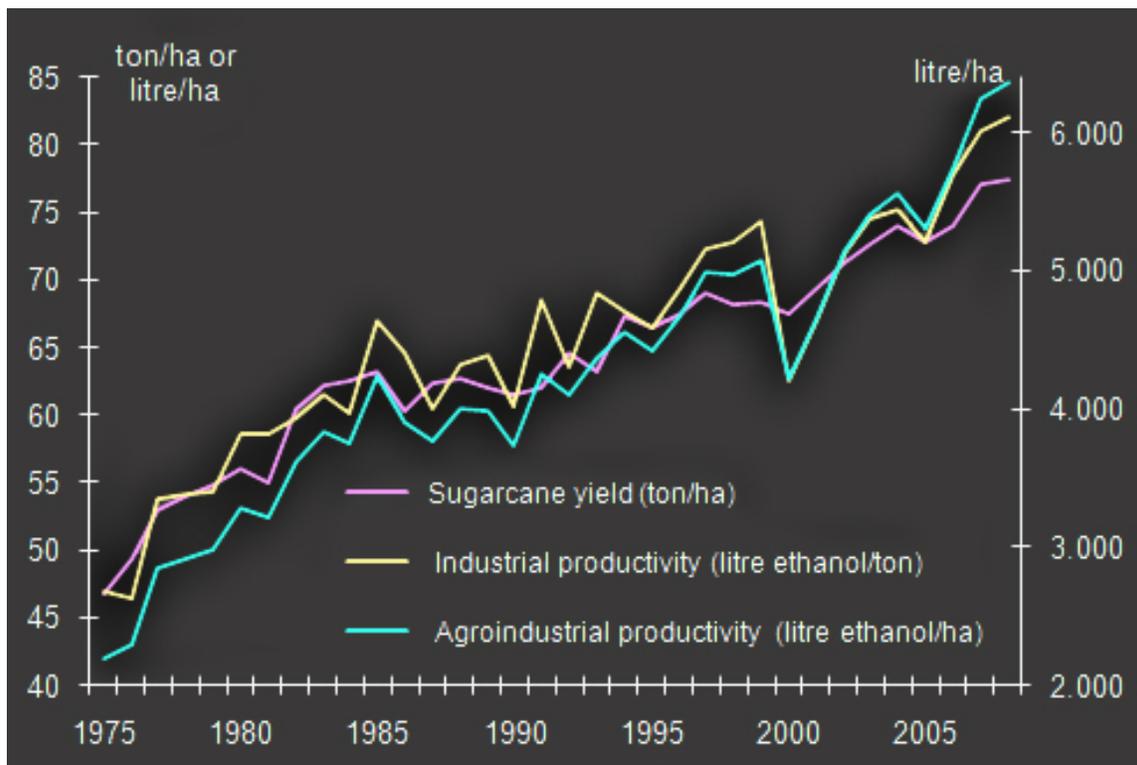
## Ethanol industry facing challenges

Brazil's ethanol industry is facing challenges that make ethanol fuel less competitive in the Brazilian Market than it once was. Natural and economic forces are further driving up the costs of ethanol production, while they are decreasing the cost of gasoline. Demand for ethanol has fallen 16% since the peak in 2010.

The first force challenging ethanol's competitive power in the fuel market is the influx of other fuels such as oil and natural gas. The new supply of oil into the market along with global demand for gasoline has meant that many fuel companies are investing resources into drilling for oil and natural gas rather than in processing ethanol.

The ethanol market also faces challenges from economic forces. During the economic downturn of the latter half of the last decade, Brazil's government took steps to curb inflation by offering steep tax reduction and fixed prices for gasoline that enabled sales of gasoline at artificially reduced costs, and heavily impacted Petrobras, the state-run energy company. This move has proven expensive for the ethanol industry, which found itself offering a product that was less cost effective when compared to the reduced prices of gasoline.

The third force challenging the Ethanol market is climate change. Heavy periods of flooding and extended droughts have taken a toll on sugar cane harvests in the last decade. While sugar cane harvests continue to set records, more effort is required to harvest ever increasing yields. With countries such as India, Australia, and Thailand increasing sugar production, sugar prices have diminished.



## **Conventional Sugarcane Processing Methods Must be Updated**

Plinio Nastari, an industry consultant in the city of Barueri, was quoted in a November 26, 2013 London interview, saying “The industry will emerge from the crisis stronger, because only the most efficient facilities will survive.” This is a theme common in many processing sectors where cheap competition has made current production capabilities untenable in the market. The ethanol production facilities which emerge from this downturn will be those that have embraced the most efficient production practices.

The need for efficiency is a driving factor in maintaining competitiveness on the ethanol market. Production facilities must look for ways to increase production efficiency at every level of the process, from harvesting to refining. By streamlining production, it will be possible to bring costs down, and better withstand the variations in the sugarcane and ethanol market.

Technology must be flexible and updated, especially during the phase between harvests, as sugarcane production facilities choose the best equipment for production. Mechanized harvesting and automated production will further increase yields and capacity, which will enable the ethanol industry to offer a competitively priced product compared to gasoline. However, to make use of this technology, methods must be in place to connect these disparate systems.

Data must also be managed carefully to truly see results. A well-connected system will enable sugar processors to measure the efficiency of their equipment and the quality of output, react to market demands with increased or decreased production, or anticipate equipment maintenance and repair. Without these systems in place, sugar processors will not have the agility to adjust capacity to meet demand.

## **SCADA Solutions: Bridging the Competitive Gap**

So, if the ethanol industry is facing challenges, what can be done to bridge the gap between ethanol and alternative energy sources, and how can sugarcane production be made more efficient?

Many believe that the answer lies in the same practices that many agribusinesses and industrial processing facilities have adopted; intelligent machines and superior supervisory and control systems.

## **New Generation of Intelligent Devices and Flexible SCADA Systems Can Drive Necessary Efficiency Gains**

One of the ways that the agricultural industry has truly taken leaps forward is in developing intelligent equipment that can gather data while in remote locations. Smart machinery can increase sugarcane yields by collecting real-time data on everything from planting to harvesting. By using smartphones and mobile devices, operators can control wastewater systems, irrigation, harvesting machines, or any smart system from anywhere.

Once the raw cane reaches the processing facility, a network of connected systems can provide useful data about every stage of the process, from first extraction to harnessing energy from bagasse. SCADA systems can connect the different streams of data and help operators determine how their production can be streamlined, and where cost can be reduced. Accurate, actionable information is critical in determining production schedules and reducing waste.

Another issue of key importance in production of ethanol from sugar cane is machine maintenance. Advanced supervisory systems can assist refinery managers in conducting preventative and timely maintenance on machines to reduce downtime and increase productive capabilities.

Flexibility is a critical component of an advanced SCADA solution. A software solution that can collect data from a wide array of devices and bring them all together into intuitive dashboards with easily understood information can play an important role in an efficient system.

### **The Benefits of an Advanced SCADA system on Sugarcane Production Efficiency**

There are countless benefits that an advanced SCADA solution can bring to ethanol processing facilities, starting from the ability to capture more data, meet government regulations more easily, and increase production efficiency of machines. All these mean that the end product can be created more cheaply, which offers a more competitive product with better margins.

### **Some Results That Can Be Achieved with a More Efficient System**

The first result that can be achieved is the ability to use smart devices to capture data from the initial stages of the process. Flexible SCADA systems that offer native drivers for sensors, PLCs and Controllers can reduce the cost of an intelligent system.

A SCADA system will offer the key data points necessary to prevent machine downtime, reduce waste, increase production capabilities, and anticipate fluctuations in production. KPIs (key performance indicators) can be measured to ensure that equipment is running at peak capacity and efficiency. Facilities that do not collect and use this information may quickly find themselves unable to compete.

The ability to monitor or remotely control multiple machines may enable production facilities to reduce personnel costs significantly. By enabling alarms that notify operators of potential issues and setting thresholds for machine variables, managers can ensure that machines shut down safely or that potential issues can be acknowledged and acted upon from anywhere within the plant, without necessarily having an operator at the machine. Remote machine capabilities allow operators to monitor machines anywhere.

Another important benefit of an efficient system is the ability to automate practices that are necessary to satisfy government and industry regulatory standards. SCADA systems can automatically generate reports required by governmental agencies, and further reduce the need to expend limited resources on maintaining compliance with regulatory standards.

Because little can be done to control external factors like climate or market fluctuation, the ethanol industry can most benefit from SCADA solutions by refining the stages of the process that can be monitored and improved, such as harvesting, production, and refining capabilities.

### **Example**

Many industries have seen the benefits an advanced SCADA solution can offer. With increases in productivity and reduced operating costs and more uptime, sugarcane processing facilities in particular are working diligently to close the current gap in demand for ethanol over oil and natural gas, not only in Brazil, but worldwide.

## Case Study: *InduSoft Web Studio in RRB Sugar Mill in India*

SCADA software platform InduSoft Web Studio was used in RRB Sugar Mills Ltd. to first regulate boilers to produce sugarcane energy in India. The project was so successful that the system was later expanded to cover the entire production process. RRB sugar Mills are now able to create and sell additional energy generated at the sugar production facility.

### **Conclusion**

The best way to protect sugarcane based ethanol processing facilities against external factors of climate change, fluctuations in government policy, and competition from alternative sources of fuel is to make ethanol production facilities as lean and efficient as possible. Brazil is heavily invested in ethanol as a fuel source and will continue to support demand for ethanol products, but for consumers to choose ethanol over gasoline, ethanol costs must be comparable to gasoline costs.

The best way to do this is for ethanol processors to implement cost-saving and efficiency improvement measures like advanced SCADA technology that will allow them to gather and evaluate data, and take steps to improve efficiency in personnel and machine production based on that data.

The benefits of such a system can greatly outweigh the costs, particularly if a SCADA platform that offers capabilities for expansion and easy integration of many disparate systems is utilized.