How Can a System Integrator Support Environmental Sustainability?

BY LUIGI DE BERNARDINI | TUE JAN 7 2020

I will not write about the effects of the climate change, because we all know how critical the situation is. The attention is on how everyone should contribute on reducing the environmental impact of our activities. We all are focused on recycling, reducing use of plastic, avoiding wastes, and keeping transportation as ecological as possible.

But how can a company be more and more sustainable, and how can a system integrator support these initiatives?

The Intergovernmental Panel on Climate Change (IPCC)—the United Nations body for assessing the science related to climate change—states in its 2019 Special Report "*Global Warming of 1.5 °C,*" which focused on how the CO2 emissions reduction can help containing the global warming, that, "The industry sector is the largest end-use sector, both in terms of final energy demand and GHG [greenhouse gas] emissions. Its direct CO2 emissions currently account for about 25% of total energy-related and process CO2 emissions, and emissions have increased at an average annual rate of 3.4% between 2000 and 2014, significantly faster than total CO2 emissions".

Most emissions are due to the combustion of fossil fuels, non-energy uses of fossil fuels in the petrochemical industry, and metal smelting—but transportation and electricity production also contribute.

In addition to emissions reduction, there are a lot of other guidelines to follow in order to have less of an impact on the environment. The four areas a company can intervene in to improve sustainability are:

· **Business**: At the higher level, a sustainability strategy has to be implemented. Tradeoffs and priorities should be evaluated in order to obtain the prefixed goals. For example, when planning new constructions, the location of the plants has to be considered, so natural resource can be leveraged in order to have less of an impact the on environment and an early optimization of the transportation that will be later required. The upgrade of existing facilities should also improve the infrastructure.

· **Supply chain**: The supply chain can be designed to optimize the network together with the route carbon. Policies regarding supplier packaging can be introduced and the right tradeoffs between just-in-time (JIT) and emissions should be evaluated. Transport, in some cases, can be zeroed using addictive manufacturing—where a supplier sends a file to be 3D printed instead of a good. This is a complete digital process with no impact on emissions production.

· **Design and engineering**: When designing a product, there are many factors to be considered which will help the company's journey through sustainability. Energy efficiency, carbon footprint, usage of alternative

materials, and an energy bill of materials (BOM) can integrate the product BOM. This could be optimized during design and also the good packaging and its following disposal (both the good and the packaging).

When engineering the process, some of the goals should be reducing asset energy, water, carbon, and waste burdens and improving flexibility.

· **Operations**: On the operation side, the scheduling of production and the detail scheduling are fundamental instruments along with energy, water, and waste management.

Production efficiency is one of the keys of sustainability and can be achieved only by integrating an efficient production process with asset energy monitoring and maintenance.

Integrating an overall equipment effectiveness (OEE) calculation system can help optimize efficiency. The higher the efficiency, the lesser the wastes and consumptions.

Several big companies that already started a sustainable journey:

· More than 10 years ago, Walmart begun its journey. In 2017, they started Project Gigaton, involving its supplier with the goal of avoiding the production of a gigaton of greenhouse gases. All the goals a supplier sets itself have to be SMART (Specific, Measurable, Achievable, Relevant, Time limited), and for each goal reached, a supplier gains “credit”.

· Google has the goal of operating entirely using renewable energy. Google is also requiring their supply chain to be sustainable, improving its energy performance and scaling the deployment of renewable energy sources.

· Amazon is committed to meet the Paris Agreement 10 years early by using 100% renewable energy by 2030. It is also raising awareness among suppliers by requiring them to use proper packaging to reduce packaging waste throughout the supply chain.

There are many other examples of smaller companies in pursuit of sustainability. The energy consumption is

often monitored and measured in order to optimize its use of water consumption and waste production. Many other initiatives are rolled out in order to influence people behavior, where a lot of companies are promoting reuse of materials reducing the use of plastic (removing plastic glasses and providing water bottles to the employees, for example). Others are encouraging smart-working to reduce the CO2 emissions related to home-to-work transportation. We can probably say that most of the companies have already implemented some kind of sustainability program.

For many years, system integrators have been involved in several traditional efficiency improvement activities like motor replacement, inverters installation, and many others strictly related to energy usage reduction. But there's much more a system integrator can do to help a company reduce its environmental impact through the operations optimization. Connecting information coming from the production plant and crossing them with energy consumption information and point-of-sale (POS) details can provide reports that can help identify possible optimizations, where having all the information separately couldn't have been enlightening. Implementing OEE systems in productions lines helps increasing efficiency and availability. Scheduling can also be improved thanks to the data collected from the field. These are only examples of benefits that can be achieved with an interconnected system, and there are many more examples that could be done.

Regulations are probably changing to make companies accountable for every occasion they aren't "green." Can you imagine the future of your company without a sustainability project?

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