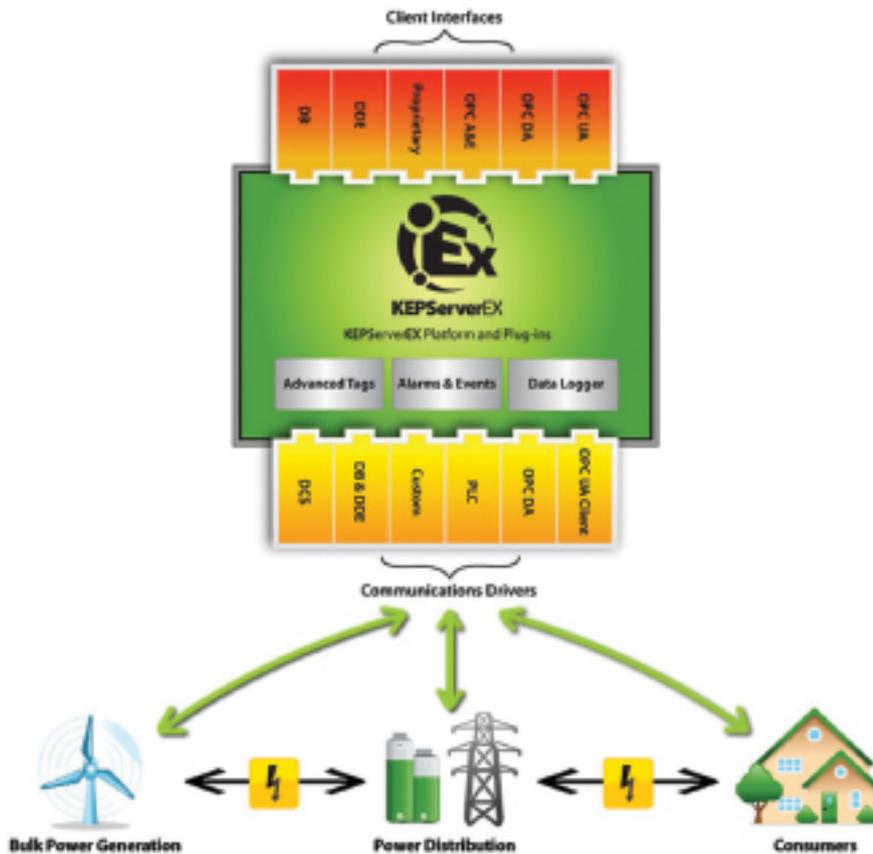


# Energy Intelligence: How Software And Initiatives Are Fueling The Growth Of Smart Grid Technology

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*Project timelines are being shortened and communication is improving*



Smart grid technology is being newly incorporated in all kinds of products and devices. Various software and integration methods are coming into play whereby new products can be brought to market faster and more cohesively to work with smart grid infrastructures. Cutting edge companies who have been able to utilize technologies such as PLM, SCADA, and ERP early on to develop clean technologies for the smart grid have benefited from early adoption. In addition, the communication standards created for the smart grid have helped to make devices and products more relevant in this market.

According to Frost and Sullivan, product lifecycle management (PLM) will have the biggest impact for product manufacturers wanting to get smarter products on the market faster. The use of PLM, the process of managing the entire lifecycle of a product from its conception, through design and manufacture, to service and disposal, is on the rise for those companies involved in smart meters, industrial products, vehicle to grid, or plug-in electric vehicles, and even smart medical devices. This is because PLM delivers a critical element to manufacturers by providing them with a product information backbone so that they can successfully

integrate people, data, processes, and business systems. Additionally, PLM is proving to offer manufacturers a way to shorten project timelines, reduce costs, and help minimize risks by evaluating possible variants within their products.

The industry analysis, market research, and consulting company, Cambashi, notes that the use of tools to manage reporting, recording, and tracking product components and ingredients has been around for some time but the need grows as products become more complex. Cambashi's Christine Easterfield remarked that, "with mechatronic or smart products of any kind, the complexity itself is multiplied. Each of the technologies involved - typically mechanical, electrical, electronic, and software - is supported by tools tuned to the needs of its own niche. The new environment means each now needs to communicate and integrate with the others. Previously parallel but separate disciplines are now required to behave as one."

Easterfield continues, "Many organizations still manage these separate technologies using their own dedicated toolsets, resulting in design silos that are not resolved until final integration or assembly of the product. With complex products, one of the major challenges is how to ensure the right piece of hardware has the right version of software on it. Where mechanical and electronic CADs are entirely separate from software development, resolving issues late in the development cycle is more than a headache. A change during the manufacture of the physical components may impact the final product in a way not anticipated by the software and similarly the impact of a change to the software will not be assessed in relation to the hardware. Sound development and systems engineering methodologies can avoid the risks and potential waste created by this silo approach. Using a more holistic approach, chances are the team will identify and deal with problems earlier, making them simpler (and less expensive) to fix."

Today industry analysts show a lot of interest in identifying opportunities for automation product manufacturers as evident through the large investments being made to implement smart grid initiatives. The implications of smart devices and smart metering applications on the product manufacturers are driving how quickly manufacturers are churning out new products to support smart grid initiatives. As a result, product and device manufacturers are streamlining their manufacturing processes and investing heavily in such technologies as PLM, ERP, process control systems, and CAD programs.

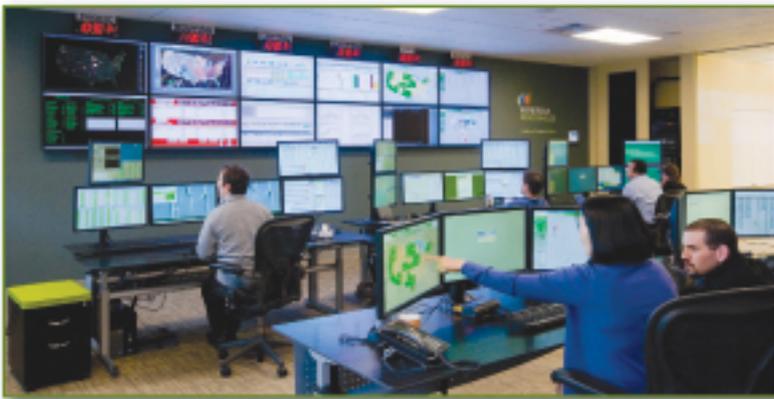
## **Bringing Products to Market Faster**

A great example of this can be seen with Petra Solar, a smart grid product-centric company new to the concepts and methodologies around PLM but savvy enough to know they have a need to automate and streamline their engineering product development and design capabilities in order to help them bring better designed products to market faster.

Petra Solar was able to develop a new technological system that combines distributed solar energy generation with smart grid communications and improved grid reliability features to create a comprehensive utility grade solution using Omnify's Empower PLM product. Petra Solar looked at PLM as a solution that could not only manage their bill of materials (BOM) needed for their manufacturing

processes but allowed them to access detailed product information from within their design environments, managed the engineering change process, and helped to eliminate the disconnect between engineering and manufacturing.

Product lifecycle management systems are well suited for helping cleantech manufacturers that are in the start-up mode of developing new devices and products. “Many of the PLM vendors today are not able to support smart grid centric companies like ours because they only offer a PLM with all the bells and whistles as opposed to giving the option to invest in the core capabilities of what a device manufacturer actually needs in terms of managing the lifecycle of their product,” says Stephen Gillespie, Petra Solar’s Program Manager. “We easily will achieve about a 75 percent reduction in our engineering change order (ECO) time and absolutely are able to bring our products faster to market since automating our processes using Omnify Empower as our PLM system,” continues Gillispie.



## Technology Supporting the Smart Grid

There are few transformations driven by information and communication technologies (ICT) that are as promising as smart grids in meeting the world’s urgent energy challenges. Kepware Technologies, who develops communications for automation and software interoperability, has been working closely with NIST (The National Institute of Standards and Technology) and conducting their own due diligence to identify Open Connectivity-compliant OPC-UA technology, as being able to address the features and benefits required in smart grid applications. Recently, NIST issued a report titled “The NIST Framework and Roadmap for Smart Grid Interoperability Standards,” which provides a list of standards and other assets needed to support an interoperable smart grid. OPC-UA is one of the few non-industry-specific standards to make the list.

An example of the importance of open standards can be seen with global renewable energy utility Iberdrola in that the company is changing the way metering systems are being selected and deployed by mandating open standards and end-to-end interoperability instead of proprietary meter communications solutions. Iberdrola Renewables can access OPC within its supervisory control and data acquisition system (SCADA) by PcVue. The PcVue SCADA system has been deployed both in the U.S. and in Spain by Iberdrola.

As part of its first phase smart grid solutions’ application in Castellon, Spain, Iberdrola turned to Current Group to provide smart metering communications, advanced sensing and network management systems. Some 100,000 meters and

respective transformers incorporating two-way medium voltage and cellular communications, grid supervision and control, and meter collection infrastructure are being deployed.

## **Initiatives Fueling Innovation**

Businesses are realizing that smart devices and applications can take information from a system or the environment to create new revenue streams, control costs, and improve products and services. In fact, the opportunities with the smart grid to bolster the performance of a business are more attractive and justifiable than ever before.

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