DELL EMC

Improving Energy Efficiency in the SAP® Smart Connected Business

INTENSE Energy Efficiency Solution on Dell EMC infrastructure

ABSTRACT

Dell EMC and INTENSE AG help your organization bring together the components of an end-to-end solution that enables your efforts to use energy more efficiently across your facilities and throughout your operations. This energy optimization solution, summarized in this paper, brings together the mass data capabilities of the SAP HANA® platform, the analytical intelligence and integrational capabilities of the INTENSE EES software suite, and the powerful data collection and processing capabilities of Dell EMC infrastructure.

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DELL EMC | INTENSE AG

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THE ENERGY CHALLENGE

Around the world, organizations are working to gain greater control over energy consumption. From manufacturing plants and office complexes to hospitals and college campuses, managers of facilities and production lines are on a constant quest to reduce energy consumption.

Some of the impetus for energy conservation is driven by governmental regulations and norms, such as the Energy Efficiency Directive in the European Union. But that's only one part of the story. At a broader level, wise use of energy equates to cost savings and product success — because a "green" label says a lot to today's environmentally conscious consumers.

In addition, monitoring energy consumption and combining energy measurements with environmental parameters can be an indicator of the quality of production processes and environment status, and provide a base for improvements and production optimization.

And then there's the other side to the story: the technical challenges. While the general goal of reducing energy use is common across industries, the available energy-efficiency solutions tend to be narrowly focused standalone products, rather than comprehensive solutions that can be used across an enterprise. The INTENSE Energy Efficiency Solution (EES) on Dell EMC infrastructure helps your organization overcome this challenge.

Together, Dell EMC, a global IT infrastructure solution provider, and INTENSE AG, a systems integrator and industry specialist in energy and utilities with deep process know-how in the project and consultancy business, help your organization bring together all the components of an end-to-end solution that enables your efforts to use energy more efficiently across your facilities and throughout your operations.

INTENSE AG

INTENSE AG focuses on the transformation of enterprises through professional IT-related process design, the development of system architectures, and SAP implementation, optimization and migration, as well as the classic areas of program and project management, testing and quality assurance. The new SAP Partner Edge program certifies INTENSE as a Silver Partner, and in 2016, INTENSE became an "SAP Recognized Expertise Partner for Utilities" — SAP's highest industry-specific award.

DELL EMC

Dell EMC, a part of Dell Technologies, services its customers — including 98 percent of the Fortune 500 — with a broad, innovative infrastructure portfolio from edge to core to cloud. A strategic SAP technology and software partner for more than 20 years, Dell EMC is a leader in server and storage performance benchmarks for SAP.

A combined offering of existing portfolios …

- SAP standard solutions with an add-on individual development for a customer added value
- Use Cases
- Industry specific process knowledge

- Dell EMC infrastructure solution stack
- Possibility to leverage the whole Dell Technologies solution stack

… to serve customer needs end-to-end on their journey of Digital Transformation

Better together

AN END-TO-END SOLUTION

SOLUTION OVERVIEW

The Dell EMC-INTENSE end-to-end solution approach for energy optimization brings together the mass data capabilities of the SAP HANA platform, the analytical intelligence and integrational capabilities of the INTENSE EES software suite, and the powerful data collection and processing capabilities of Dell EMC infrastructure.

The solution combines data on energy consumption, production planning and expenses from SAP systems with data captured from connected devices and sensors and equipment across the enterprise, as well as data from external sources. This tightly integrated solution, depicted in Figure 1, gives you a complete and transparent picture of your energy usage patterns and your opportunities to optimize your systems, processes and operations to reduce energy consumption.
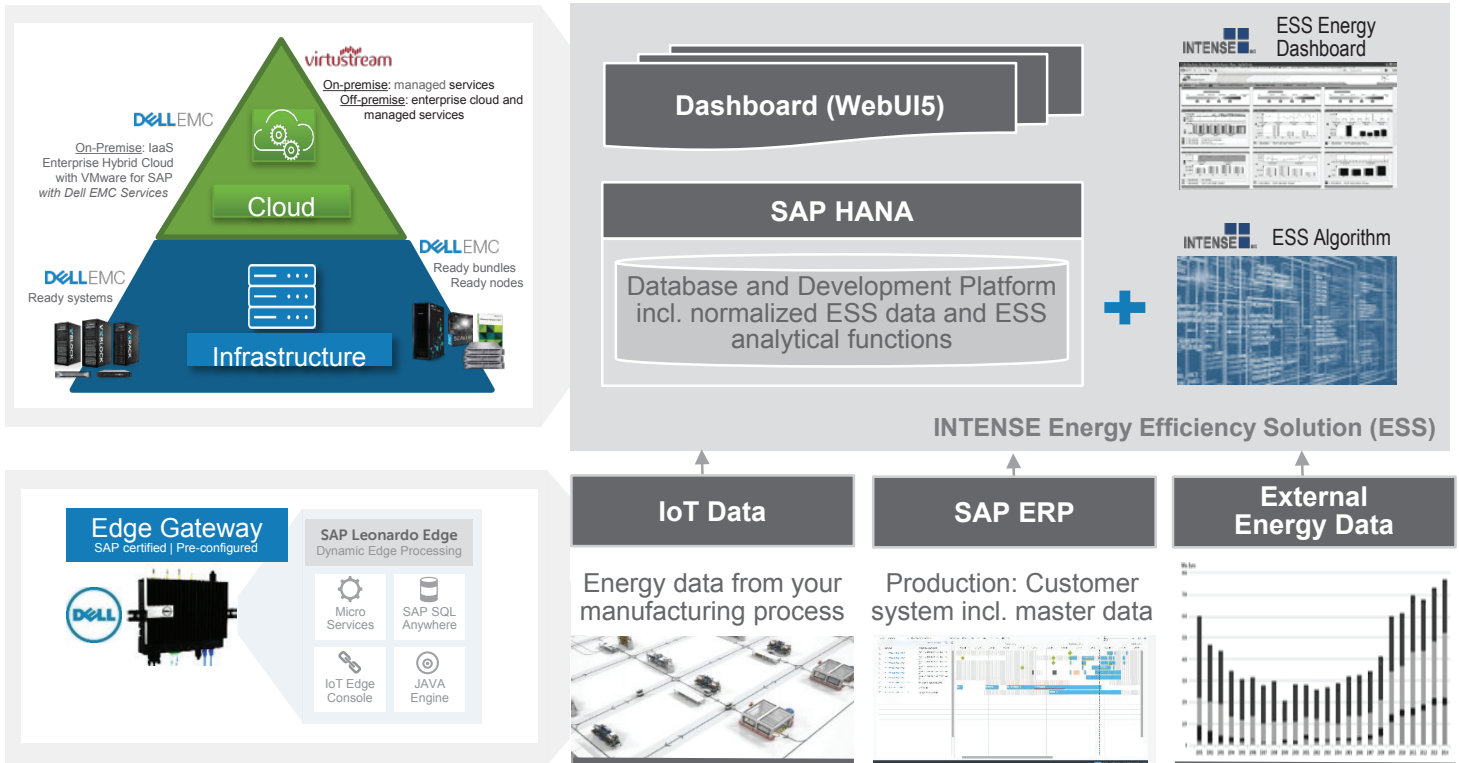

Figure 1. This graphic shows the approach for the Dell EMC-INTENSE solution for energy optimization.

SOLUTION COMPONENTS

INTENSE EES

INTENSE EES is an add-on software suite that extends the capabilities of the SAP HANA in-memory analytics platform and visualizes complex data in a comprehensive and customizable way. Capabilities embedded in the INTENSE EES suite include:

- Collection, administration, evaluation and display of all energy-specific measurement data and relevant environment values from external systems and sensors combined with production data from SAP systems

- Visualization of detailed values and measures for energy consumption in the production environment, combined with information on workplaces, production goods and environment parameters

- Graphical visualization, historical comparisons and location comparisons of single machines up to machine clusters

- Warning and alarm functions based on deviations from expected analysis results

- Identification and management of energy efficiency potentials and implementation measures

Looking ahead, the roadmap for the INTENSE EES suite includes the addition of multiple new features, including:

- Various options for performing regression analysis on given sensor data to find dependencies of several characteristics (e.g., temperature and energy consumption)

- Forecast of energy consumption of objects based on saved analyses

- Delivery of forecast data to SAP ERP production planning

INTENSE EES presents information on an energy dashboard that gives you a clear overview of various KPIs and near real-time data. In addition, INTENSE EES is designed to build a knowledge base that allows you to compare your energy consumption metrics against historical data from other energy users in your industry.

DELL EMC INFRASTRUCTURE

Dell EMC infrastructure components for INTENSE EES include the groundbreaking Dell Edge Gateway for the intelligent capture of all relevant measurement data from the production plant, and the compute power of our Dell EMC PowerEdge™ servers with Intel® Xeon® processors, in combination with Dell EMC storage and networking products. To streamline and accelerate deployment, the Dell EMC infrastructure is available in Ready Solutions that are optimized for SAP HANA.

The Dell Edge Gateway, with powerful dual-core Intel® Atom™ processors, connects varied wired and wireless devices and systems, aggregates and analyzes the input, and sends it on to the INTENSE EES solution running on the SAP HANA platform. Because the gateway sits close to your devices and sensors, it sends only meaningful data to the cloud or control center, saving you expensive bandwidth.
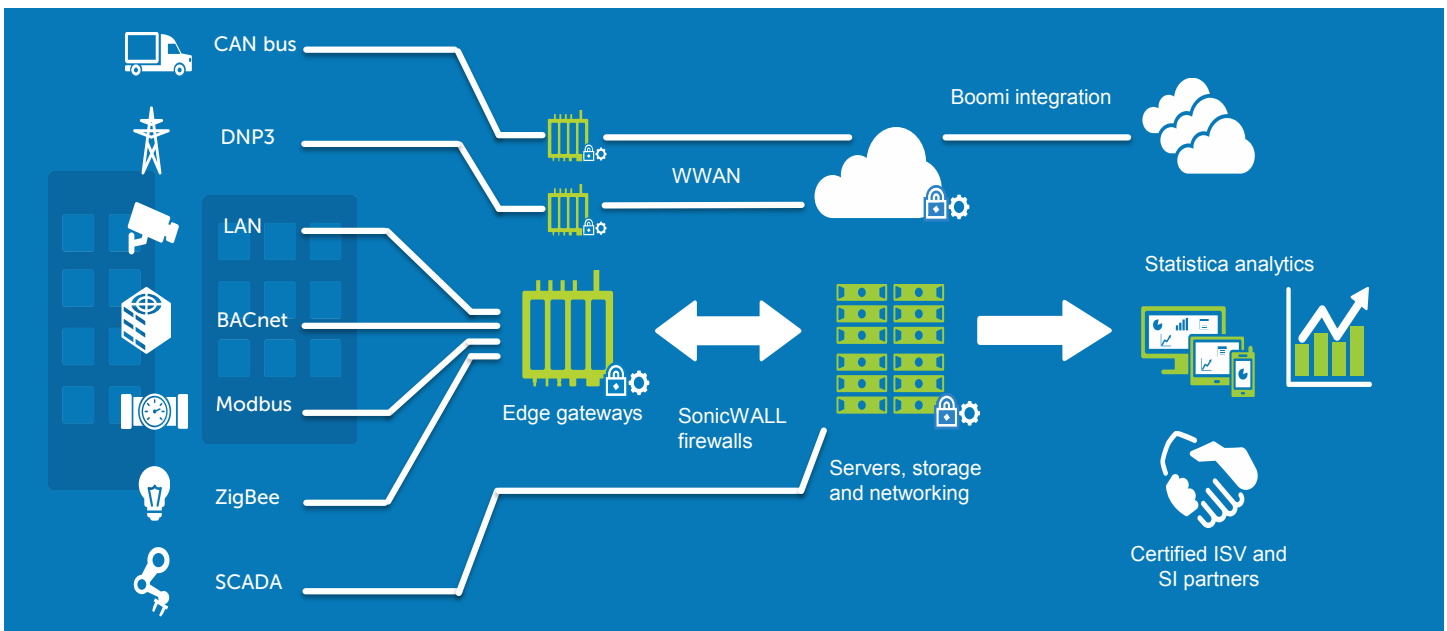

Figure 2. The Dell EMC-INTENSE end-to-end solution approach for energy optimization leverages the Dell EMC framework for the smart connected business.

SAP HANA

The INTENSE EES software suite for energy optimization is built on SAP standards and SAP technologies, using an SAP HANA database. SAP HANA is designed to handle big data by processing transactions and analytics in-memory on a single data copy. It combines powerful data transformation with analytical functionality to deliver real-time insights from live data or analytical insights beyond the obvious.

SAP LEONARDO — IOT FOR BUSINESS

SAP Leonardo brings together all of the latest technologies and services in one intelligent system.

This digital innovation system integrates breakthrough technologies and runs them seamlessly in the cloud. It offers design thinking methodology and SAP expertise to help you quickly adopt new capabilities and business models that accelerate your digital transformation, while remaining on the leading edge as SAP adds new technologies to the portfolio.

SAP Leonardo Edge, the Internet of Things (IoT) component of SAP Leonardo, adds unique value to the EES on Dell EMC solution, which uses Dell Edge Gateways to collect, analyze and transfer data from the edge to the core. SAP Leonardo Edge provides computing as micro-services within a pod that can be deployed on edge computing devices, such as the Dell Edge Gateway — currently the only SAP-certified edge gateway. The SAP Leonardo Edge platform provides a secure runtime environment on edge computing device for edge services, including lifecycle management and communication to the connected "things" via protocol adaptors. It also provides the integration with the cloud platform.
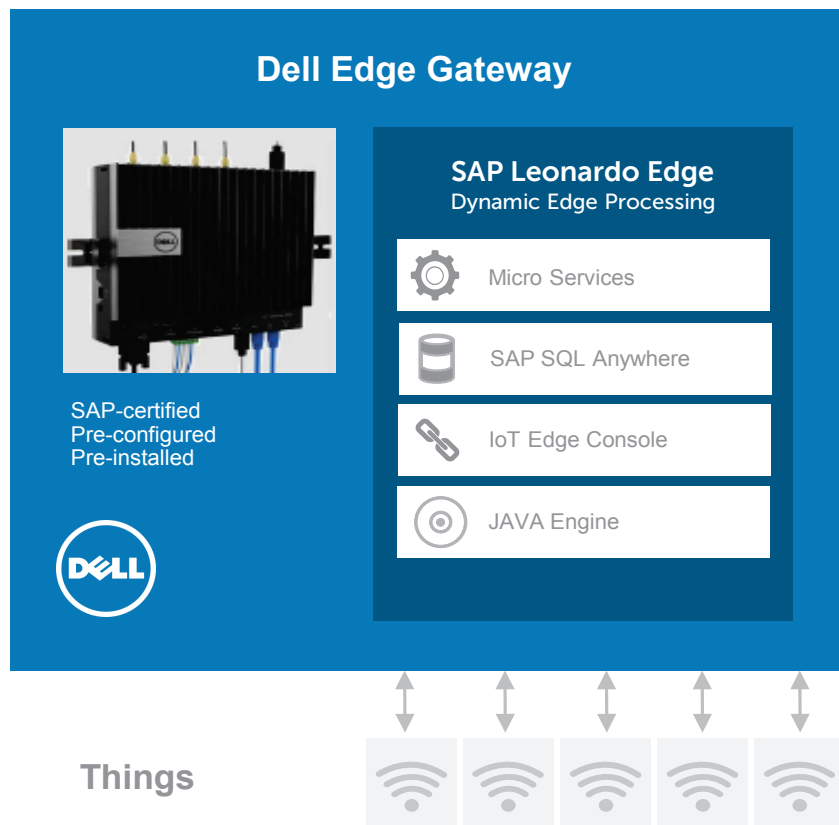
EDGE

Figure 3. SAP Leonardo Edge computing utilizing SAP-certified Dell Edge Gateways.

BENEFITS ACROSS YOUR ENTERPRISE

The Dell EMC-INTENSE solution for energy optimization delivers benefits that span the enterprise. The solution helps you:

• Identify energy optimization opportunities within your facilities and production processes

• Reduce energy consumption and the associated expenditures for energy

• Gain a clear, transparent view of your energy expenses and savings

• Derive production optimization options from energy consumption and environmental parameters

• Maintain compliance with governmental regulations for energy efficiency

DIVERSE USE CASES

The use cases for the Dell EMC-INTENSE solution span a wide range of industries, from manufacturing and data centers to healthcare and real estate. These and countless other industries have excellent opportunities to capitalize on energy-efficiency programs.

Here are a few examples of the ways in which organizations can put the solution to work:

DETECT AND MONITOR ENERGY CONSUMPTION

The Dell EMC-INTENSE solution provides the foundation for a holistic energy management strategy that can help plant operators identify energy-intensive production facilities. Energy consumption data can be collected for clearly defined units or grouped units, such as different energy consumers in a production plant, different production units and different production areas. Energy consumption can be defined in terms ranging from general consumers, such as lighting and heating, to specific consumers, and can be recorded alongside additional environmental parameters.

The solution also enables the comparison of energy consumption at different sites. For example, in a factory, all CNC (computer numerical control) milling machines might be grouped together to form a production group that can be compared across locations.

COMPARE AND ANALYZE ENERGY DATA, ENVIRONMENTAL PARAMETERS AND PRODUCTION DATA

Energy data can be evaluated, cumulated and compared according to any criteria, thus forming the possibility to define a baseline and to recognize deviations and changes. In addition, relevant environmental parameters can be captured, recorded and evaluated in relation to energy consumption.

Plant operators might use data captured by the solution to evaluate energy consumption in such terms as same production unit/different product, same unit/same product but different running times, and same product/same machine in different plants. They also might use INTENSE EES to explore the reasons why the same CNC milling machines operated in different areas of a facility have different hourly part ejection rates.
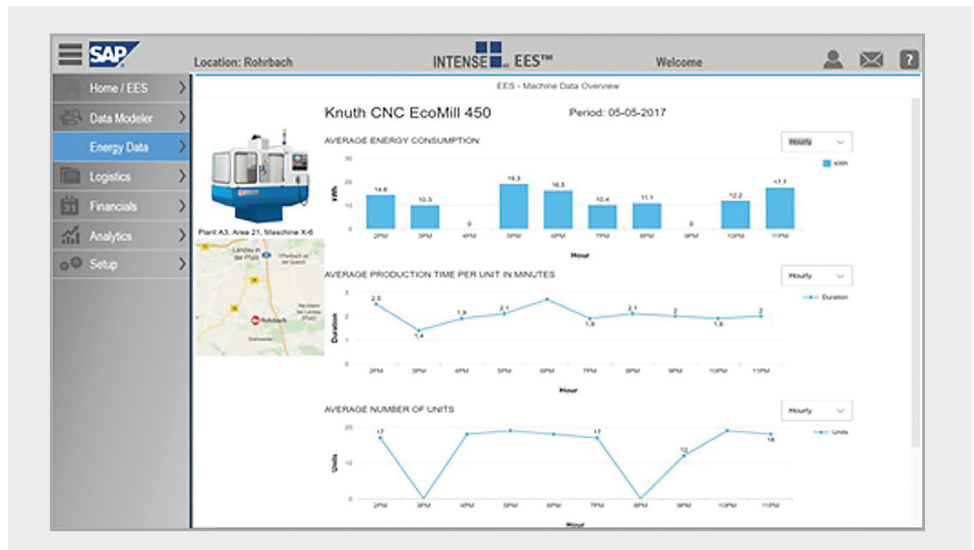
Figure 4. The Dell EMC-INTENSE solution provides a graphical view of interrelated data. This example shows energy consumption in relation to production time per unit and numbers of units produced.

NORMALIZE ENERGY DATA

Drawing on mathematical methods, the Dell EMC-INTENSE solution enables energy data to be compared with its influencing factors, and key figures to be derived from the comparison. This is the basis for making conclusions about energy efficiency that take into account environmental factors. For example, a manufacturer might consider energy data in terms of influencing factors in an injection molding machine, such as the moisture of the granules, flow temperature, ambient temperature and the current temperature of the cooling environment.

Energy management can also serve as a "fever temperature of production," in which multiple measurements are aggregated and normalized to yield a single indicator of overall energy efficiency, just as a body thermometer provides a single indicator of overall health. Changes in the overall efficiency number can be indicative of the need for changes in the production process to optimize energy consumption.

BETTER TOGETHER: DELL EMC, INTENSE AND SAP

The Dell EMC-INTENSE solution for energy optimization brings together all of the hardware, software, services and expertise you need to design and deploy a comprehensive energy-efficiency solution that spans your environment.

• Dell EMC provides a blueprint for industry-leading, interoperable IoT solutions that leverage proven infrastructure components and powerful hardware required to drive big data analysis and industry-level IoT data collection and exchange.

• INTENSE offers extensive industry and process knowledge, combined with SAP implementation know-how and software designed from the ground up to function as an SAP add-on.

• SAP provides SAP HANA for in-memory, high-speed computing and the SAP Leonardo platform to enable IoT for business — to get from things to outcomes.

Ultimately, the combination of powerful hardware components, powerful analysis software and a powerful in-memory database will help bring your business to a new level of energy efficiency.

LEARN MORE

To learn more about running INTENSE EES on Dell EMC infrastructure in an SAP HANA environment, contact your Dell EMC representative or visit the Dell EMC Ready Solutions for SAP web page at http://dell.to/2uqIF74 or the INTENSE web page at www.intense.de.

To learn more, visit: DellEMC.com/sap