Net Zero Intelligent Operations (NIO)

Keeping the promise of a brighter future with IoT-powered intelligence

Overview

A study by the International Energy Agency (IEA) underlines exactly what is required to stay on the net-zero pathway by 2030:

○ **A 4x increase in solar and wind power generation capacity additions**

○ **A 4% decrease in energy intensity per year until 2030**

At HCL Technologies, we are committed to enabling our clients achieve their net-zero emissions goals by 2030 and beyond – critical to ensure the future of the planet.

Current energy management (EM) systems allow organizations to collect energy/efficiency data from manufacturing plant assets and processes and deliver a unified view of energy consumption across the plant – enabling energy optimization measures at a local/plant level.

Nearly 85% of manufacturers consider key insights from across enterprises as critical to realize net-zero, but almost 42% of them cite a lack of data analysis knowledge within their business as a barrier to implementing change.

Source: The Manufacturer
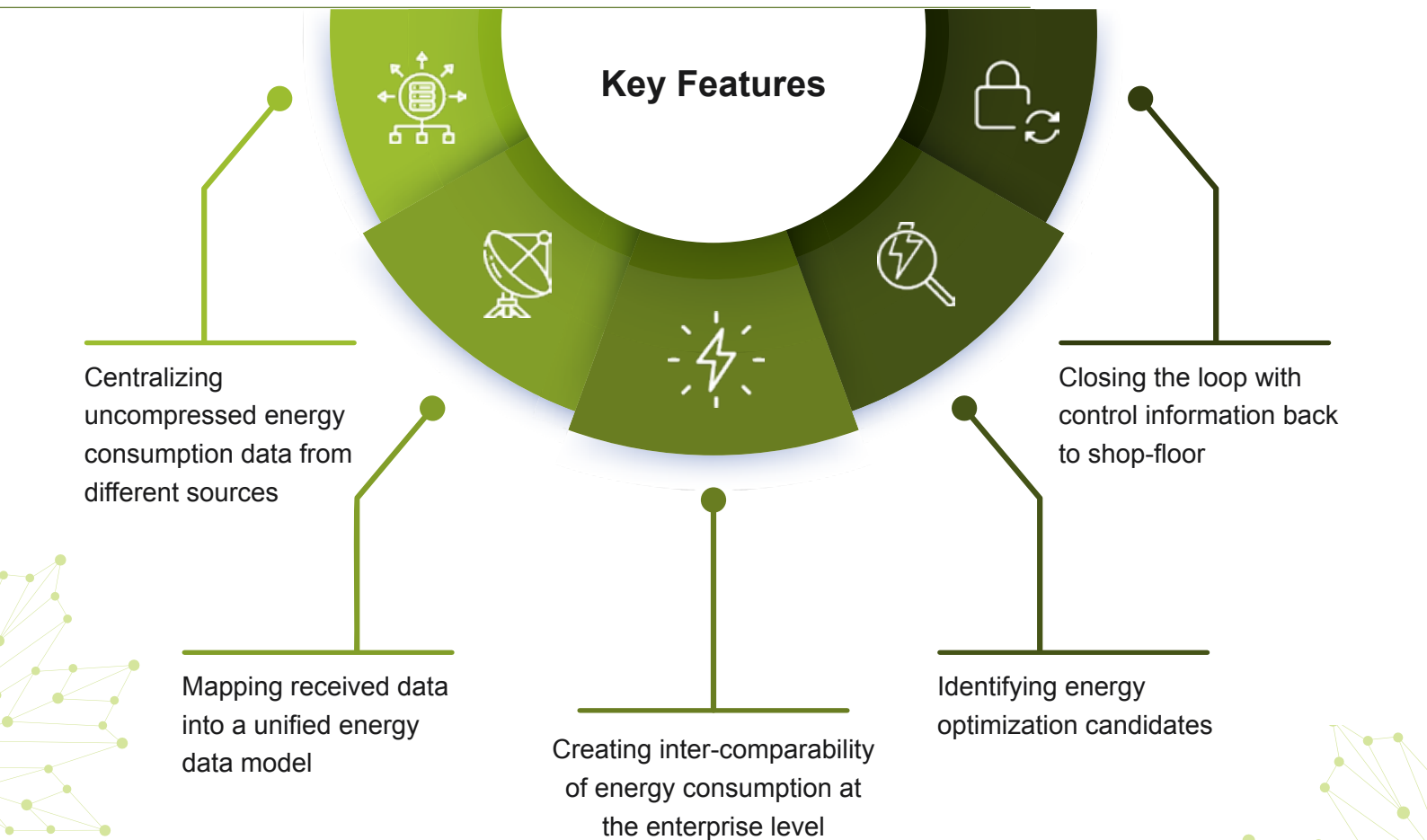
About our Solution

This is where Net Zero Intelligent Operations (NIO) by IoT WoRKS™ comes in. The solution enables clients to monitor, assess, and reduce enterprise energy consumption and carbon emissions through its unique inter-comparability and normalization approach across multiple equipment, processes, and facilities.

NIO taps into digital twin and AI to achieve this. It delivers a set of functionalities to optimize energy consumption in a manufacturing environment at the enterprise level. NIO can help organizations reduce associated carbon emissions which contribute to net-zero goals.
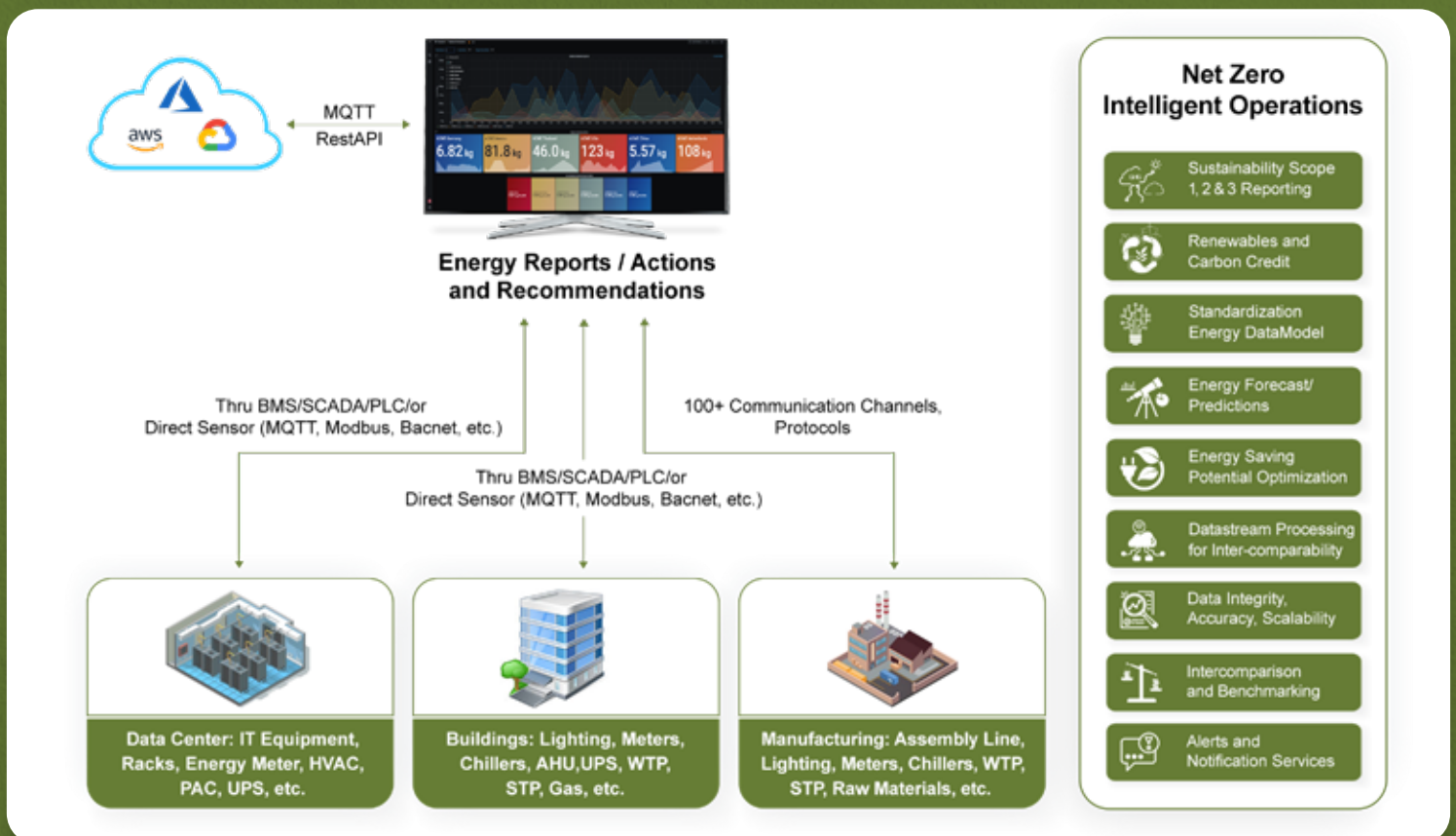
NIO is our foremost sustainability-focused offering that aims to help our customers monitor, normalize, compare, and reduce energy consumption and GHG emissions in real-time. The solution helps clients reduce carbon emissions by optimizing the energy intensity of assets and processes. It also enables calculating, reporting, and identifying emission optimization potential for workspaces and shop floors.

NIO gives unparalleled insights into organizations' energy consumption and carbon emission metrics, such as Energy Efficiency Ratio (EER), kilo watt per tonnage, and inter comparability between plants or equipment, which is its unique proposition. The solution can look at the total energy consumption across all the facilities and can highlight the plants as well as assets basis efficiency. It also identifies key influencing factors and compares efficiency insights to industry benchmarks, and recommends optimization measures that can be taken to improve them.

Key Features

Centralizing uncompressed energy consumption data from different sources

Mapping received data into a unified energy data model

Creating inter-comparability of energy consumption at the enterprise level

Identifying energy optimization candidates

Closing the loop with control information back to shop-floor

Solution Architecture

MQTT
RestAPI

6.82 kg 81.8 kg 46.0 kg 123 kg 5.57 kg 108 kg

Energy Reports / Actions and Recommendations

Thru BMS/SCADA/PLC/or Direct Sensor (MQTT, Modbus, Bacnet, etc.)

100+ Communication Channels, Protocols

Thru BMS/SCADA/PLC/or Direct Sensor (MQTT, Modbus, Bacnet, etc.)

Data Center: IT Equipment, Racks, Energy Meter, HVAC, PAC, UPS, etc.

Buildings: Lighting, Meters, Chillers, AHU,UPS, WTP, STP, Gas, etc.

Manufacturing: Assembly Line, Lighting, Meters, Chillers, WTP, STP, Raw Materials, etc.

Net Zero Intelligent Operations

- Sustainability Scope 1, 2 & 3 Reporting
- Renewables and Carbon Credit
- Standardization Energy DataModel
- Energy Forecast/ Predictions
- Energy Saving Potential Optimization
- Datastream Processing for Inter-comparability
- Data Integrity, Accuracy, Scalability
- Intercomparison and Benchmarking
- Alerts and Notification Services

Solution Features

Collect

- ◎ Master data management
- ◎ 100+ protocol support
- ◎ Integration with third-party systems
- ◎ Include influencing variables such as weather, employee count, production, etc

Analyze and Optimize

- ◎ Intercompare between the sites or equipment
- ◎ Organization to equipment level visibility
- ◎ Identifying potential areas for optimization
- ◎ Detailed load and power quality analysis
- ◎ Sustainability scope 1, 2, and 3 needs
- ◎ Persona-based views
- ◎ Rule-based notification
- ◎ Integrate further with a third-party system for optimization

Measure

- ◎ Sustainability KPIs
- ◎ Energy consumption and carbon emission KPIs
- ◎ Industry-specific KPIs
- ◎ From accurate data

Others

- ◎ Vendor agnostic
  - ◉ On board on any cloud
  - ◉ Integrate any asset
- ◎ Highly scalable
- ◎ Fast deployment
- ◎ Robust and secure
- ◎ Unified Energy Data Model with the flexibility to accommodate new data and object types

Benefits

~8-10% reduction in carbon footprint per year

~7-10% annualized energy savings with rapid shift in energy optimization measures

~6-10% optimization in annual operational costs

Significant Energy User's (SEU) identification

Ensure regulatory compliance for key standards like ISO 50001, etc

Real-time data to optimize enterprise processes

Case Study

The client is a major global automotive leader with 10 world-class automobile brands from multiple European countries. Our goal was to enable them to pinpoint, reduce, and monitor their energy-intensive operations, starting with their paint shop operations to dramatically reduce their greenhouse gas emissions and carbon footprint across this plant and multiple divisions of the company.

Customer's problem

- Energy Consumption is measured onsite per manufacturing entity (Lines, Assets, Machines) & aggregated Bottom Up without contextual information

- Workspace energy consumption is not correctly reported due to distributed assets

- Enterprise top-view reports identify site energy consumptions but lack comparability

- Optimization must happen in local, onsite environments without indications of any kind

Our solution

- NIO by HCL IoT WORKS™ picks up raw, uncompressed energy and process data from local manufacturing (Lines, Assets, Machines) & diversified assets in workspaces

- NIO normalizes Energy Consumption in real-time and groups Significant Energy Consumers into comparable Energy Groups (same technology, same process, etc.)

- NIO brings inter-comparability to the connected manufacturing environment, enabling enterprises to identify energy optimization potentials top-down in newly created Energy Groups

- NIO enables enterprises to achieve ISO 50,001 certification

Client Speaks

"

With the NIO approach, our company is able to precisely identify the energy optimization potential across all sites connected to the solution. In agreement with responsible site managers, we are able to reduce our internal energy cost by 7%+ in following years.

"

Project Manager Sustainability
Leading Automotive Manufacturer

About Us

IoT WoRKS™ at HCL Technologies

IoT WoRKS™ is a dedicated IoT business unit of HCL Technologies. Our award-winning, best-in-class, customer and industry-specific, deployment-ready solutions co-created with customers enable them to maximize effectiveness and returns on their asset investments. Rated as a global leader in IoT consulting & services by top analysts, our solutions allow IoT-led business transformation by creating more efficient business processes, new revenue streams, and business models that deliver measurable business outcomes. At HCL, we believe that the transformative impact of IoT is realized by IoTizing the 'things,' connecting the assets to a data platform, and then using the data to derive business insights and make business decisions which ultimately lead to change in the enterprise's processes and people practices.

HCL Technologies

HCL Technologies is a next-generation global technology company that helps enterprises reimagine their businesses for the digital age. Our technology products and services are built on four decades of innovation, with a world-renowned management philosophy, a strong culture of invention and risk-taking, and a relentless focus on customer relationships. HCL also takes pride in its many diversity, social responsibility, sustainability, and education initiatives. Through its worldwide network of R&D facilities, co-innovation labs, global delivery capabilities, and over 211,000 'Ideapreneurs' across 52 countries, HCL delivers holistic services across industry verticals to leading enterprises, including 250 of the Fortune 500 and 650 of the Global 2000.