Rockwell Automation

Energy Management and Optimization Software Portfolio Overview

FactoryTalk® Energy Manager™
SaaS

expanding **human possibility**®

FactoryTalk® Energy Manager™ SaaS

The industrial energy management and optimization solution built on an industrial DataOps platform

CAPABILITIES

- Integration of electric and all non-electric resource types
- Real-time data acquisition and monitoring
- Flexible and customizable energy model
- Pre-built dashboards to report on energy performance indicators
- Contextualize energy data with operational technology (OT) data and understand energy intensity or emissions intensity
- Charting and no-code analytics
- Alerts and notifications via email

SCALABILITY

- Single site, multi-site or enterprise

INFRASTRUCTURE

- Multi-tenant software as a service (SaaS) environment
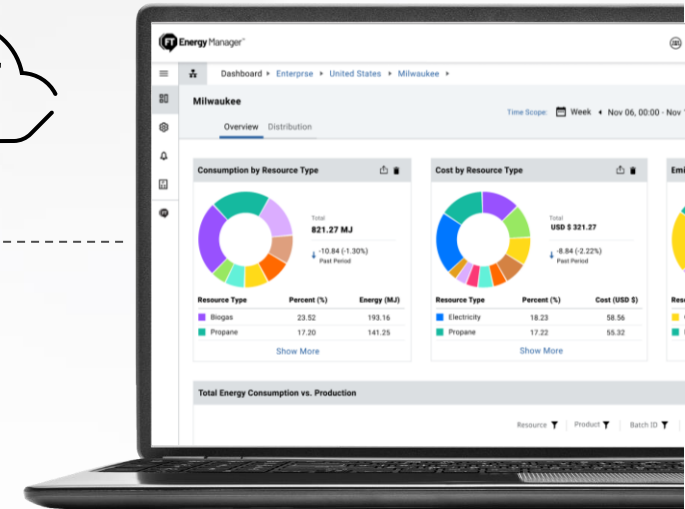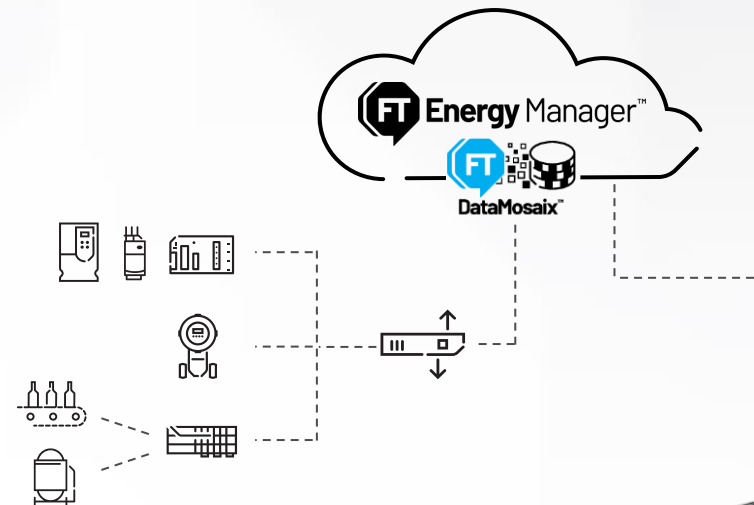- Rockwell Automation managed infrastructure

BENEFITS

ACCELERATE your digital transformation with industrial DataOps and achieve sustainability goals

FASTER TIME-TO-VALUE with a ready to use and lifecycle managed solution

Explore FactoryTalk® Energy Manager™
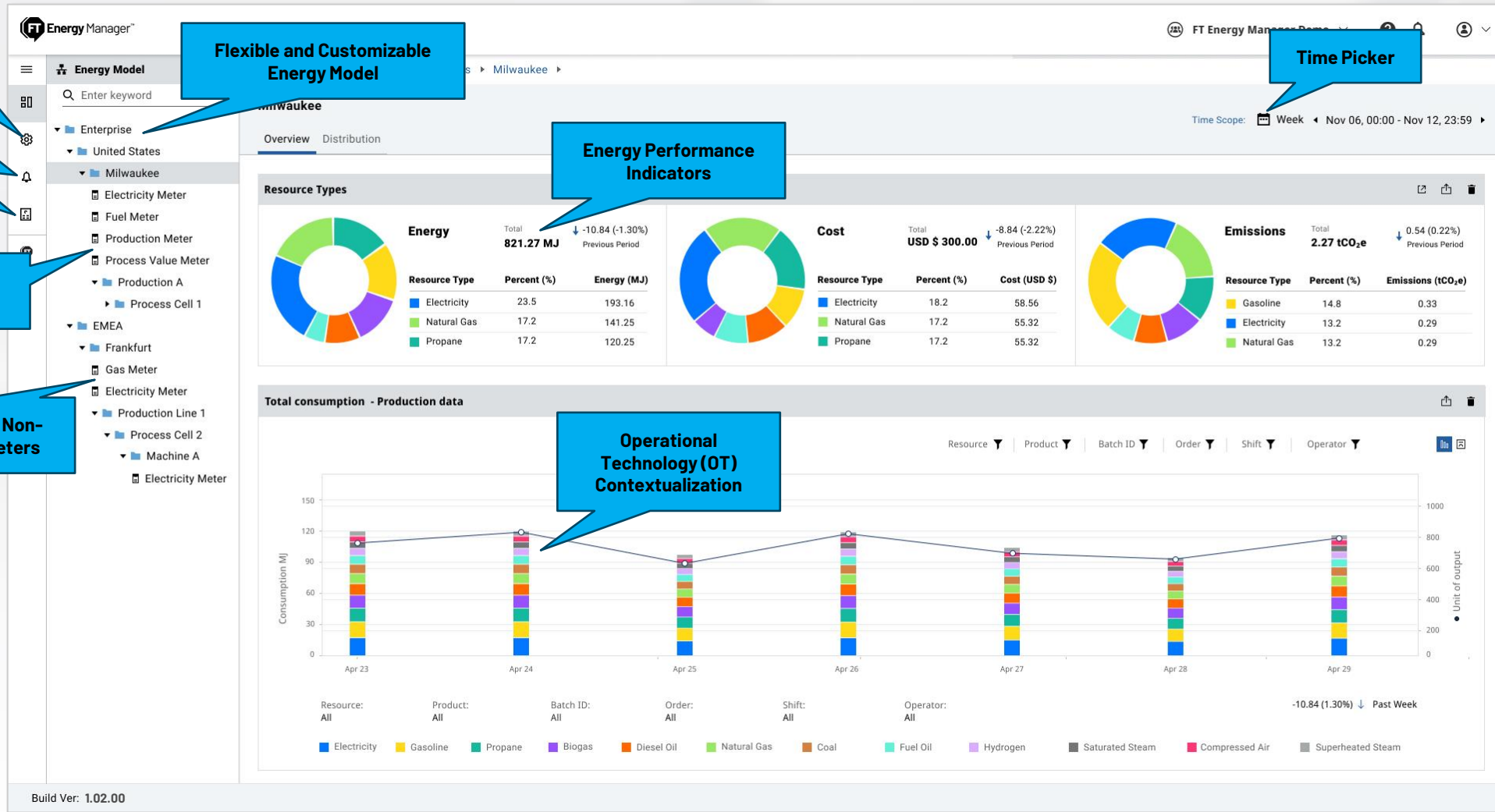
Integration of electric and all non-electric resources

Gain a complete understanding of your energy consumption and emissions

- Supported electric and non-electric resources
  - Electricity, natural gas, biogas, propane, hydrogen, diesel oil, fuel oil, gasoline, crude oil, coal, tallow, water, wastewater, compressed air, chilled water, hot water, steam saturated, steam superheated

- Automatic unit conversion and unit harmonization

- Pre-built energy and emission calculations

- Predefined data models
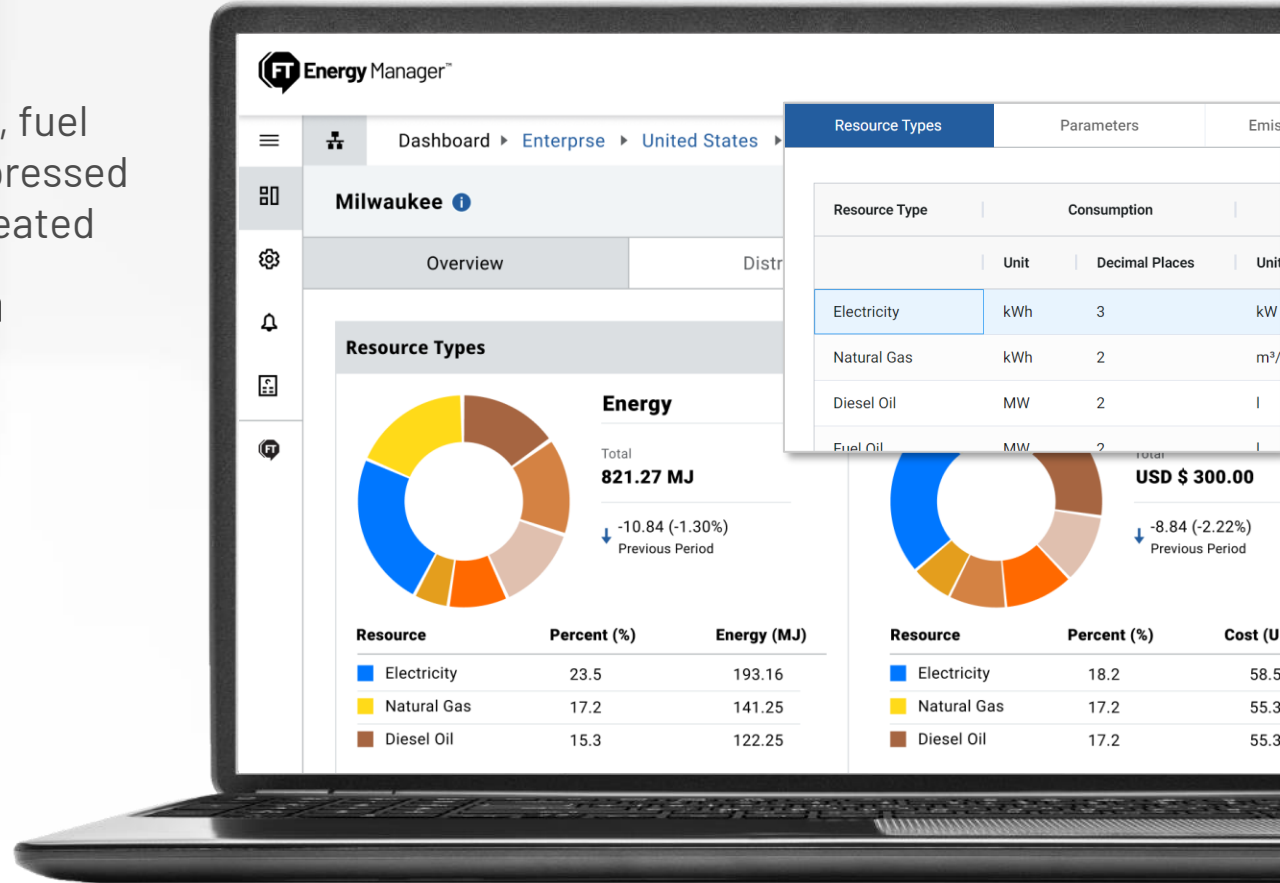
Flexible and customizable energy model

The first step in gaining control is to measure all the resources flowing through your system
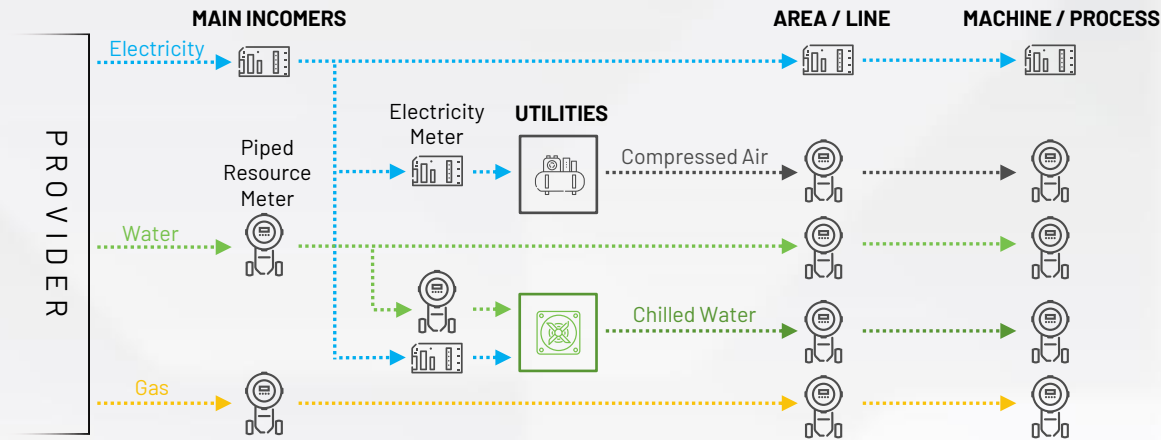
- Create a **digital twin** of your energy infrastructure with a configurable energy model hierarchy

- Make use of **pre-built dashboards** for every level of the hierarchy

- **Add additional data points** like production counts or process values to the hierarchy to further contextualize energy data
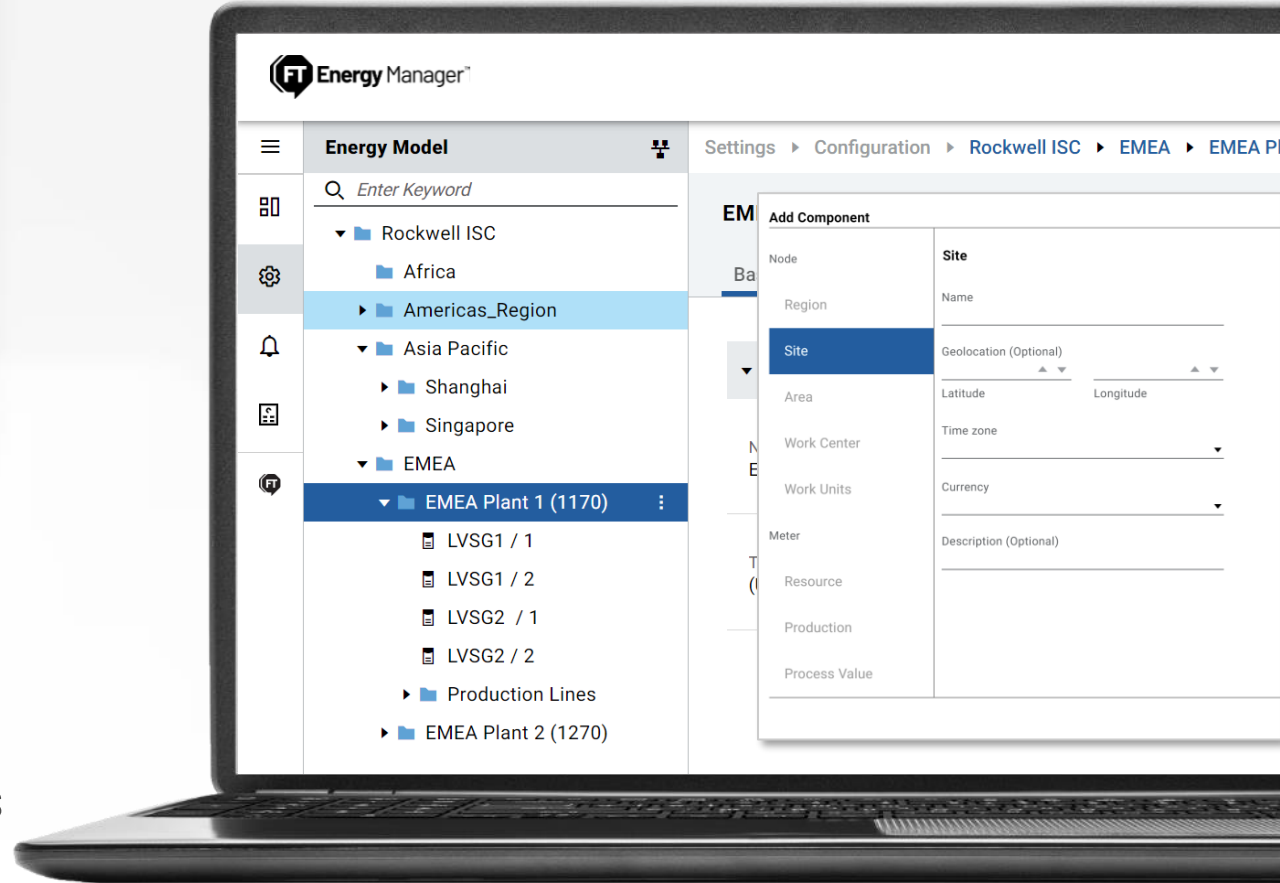
Real-time data acquisition and monitoring

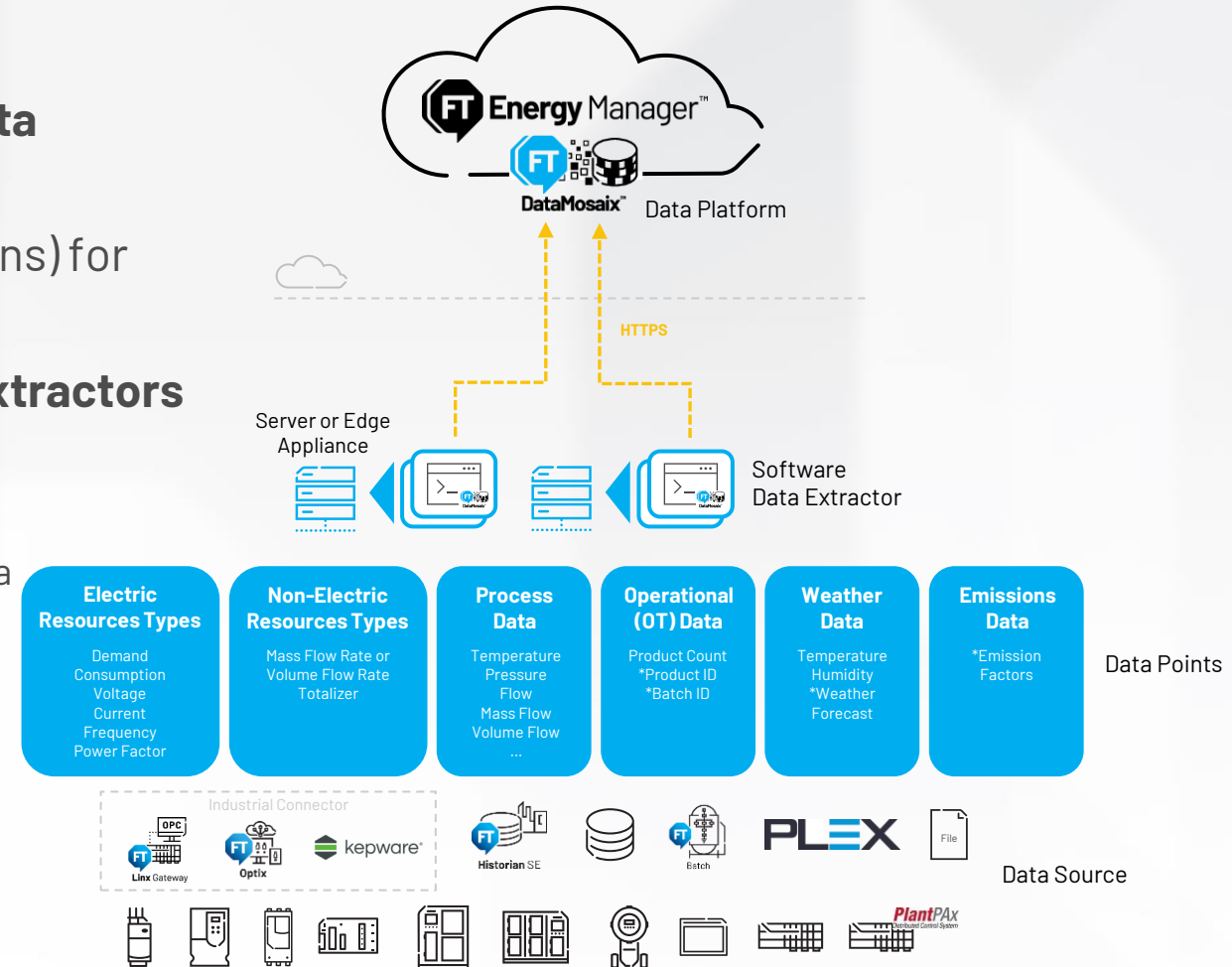Unified data onboarding experience

- Access and onboard **energy, operational or process data** wherever it lives

- Leverage **Rockwell Device Libraries** (Add-On Instructions) for enhanced energy data visibility

- Stream or upload data using **pre-built Software Data Extractors**

  - **OPC-UA** extractor to connection data points via FactoryTalk® Linx, FactoryTalk® Optix™ or Kepware

  - **FactoryTalk® Historian** extractor to connect to existing Historian data

  - **ODBC** extractor to onboard data from databases

  - Create a **custom extractor** if your source type cannot be used with any of the available extractors

  - Well documented and **easy to configure** software extractor file

    - Update **frequence** or **data persistence** (Failure-Buffer) can be configured within the **extractor configuration file**

FT Energy Manager™ — DataMosaix™ — Data Platform

HTTPS

Server or Edge Appliance

Software Data Extractor

Electric Resources Types	Non-Electric Resources Types	Process Data	Operational (OT) Data	Weather Data	Emissions Data
Demand Consumption Voltage Current Frequency Power Factor	Mass Flow Rate or Volume Flow Rate Totalizer	Temperature Pressure Flow Mass Flow Volume Flow ...	Product Count *Product ID *Batch ID	Temperature Humidity *Weather Forecast	*Emission Factors

Data Points

Industrial Connector — Linx Gateway, Optix, kepware — Historian SE — Batch — PLEX — File

Data Source

PlantPAx Distributed Control System

Rockwell Automation

Pre-built dashboards to report on energy performance indicators

Track and analyze usage

- **Consumption** charts for **electric** and **all non-electric resource types**

- Understand energy consumption **at every level** within an organization

- Ability to track and analyze usage against a specific time or understand **total energy consumption** with predefined time scopes
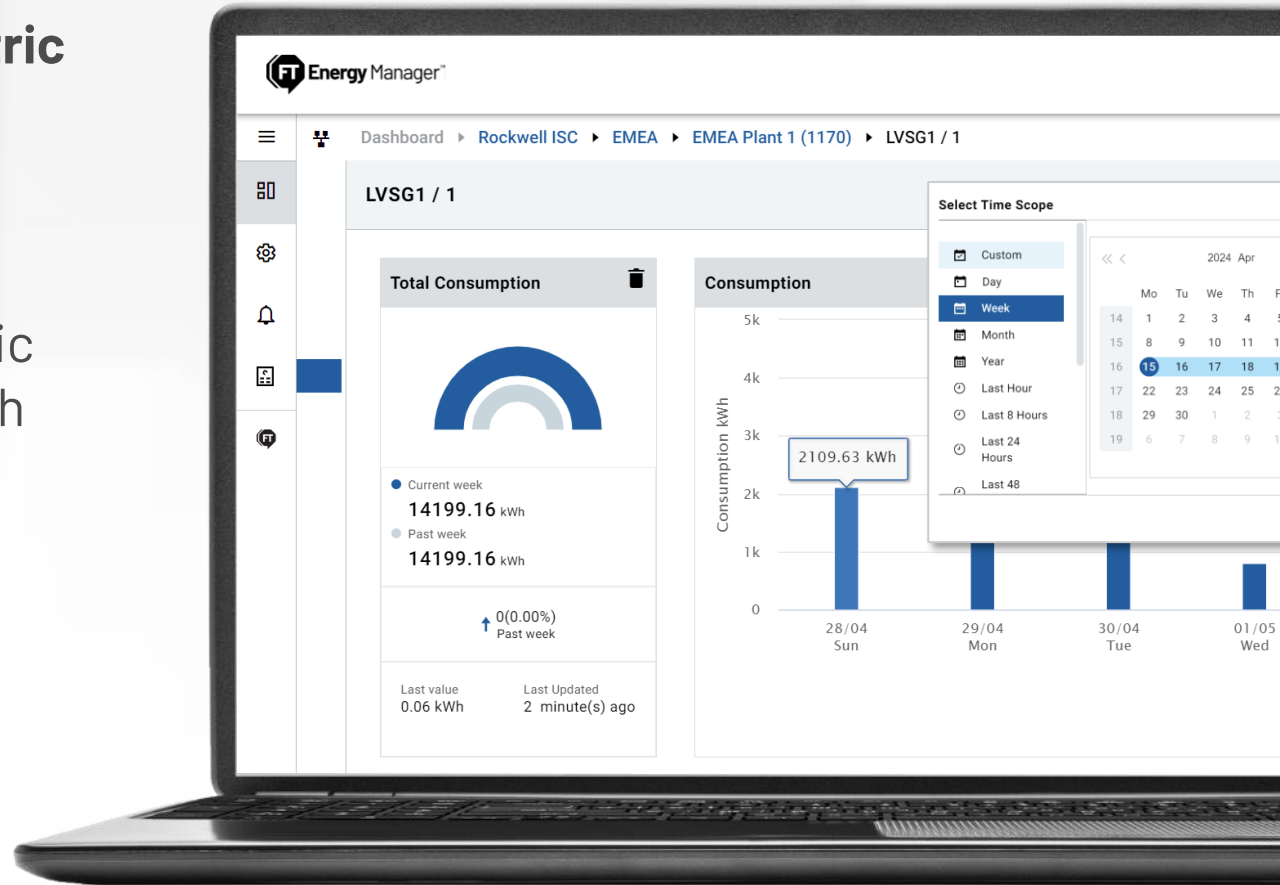
Pre-built dashboards to report on energy performance indicators

Track and analyze usage

- Consumption **Sankey** diagram to understand the **flow** and **distribution** through the energy infrastructure
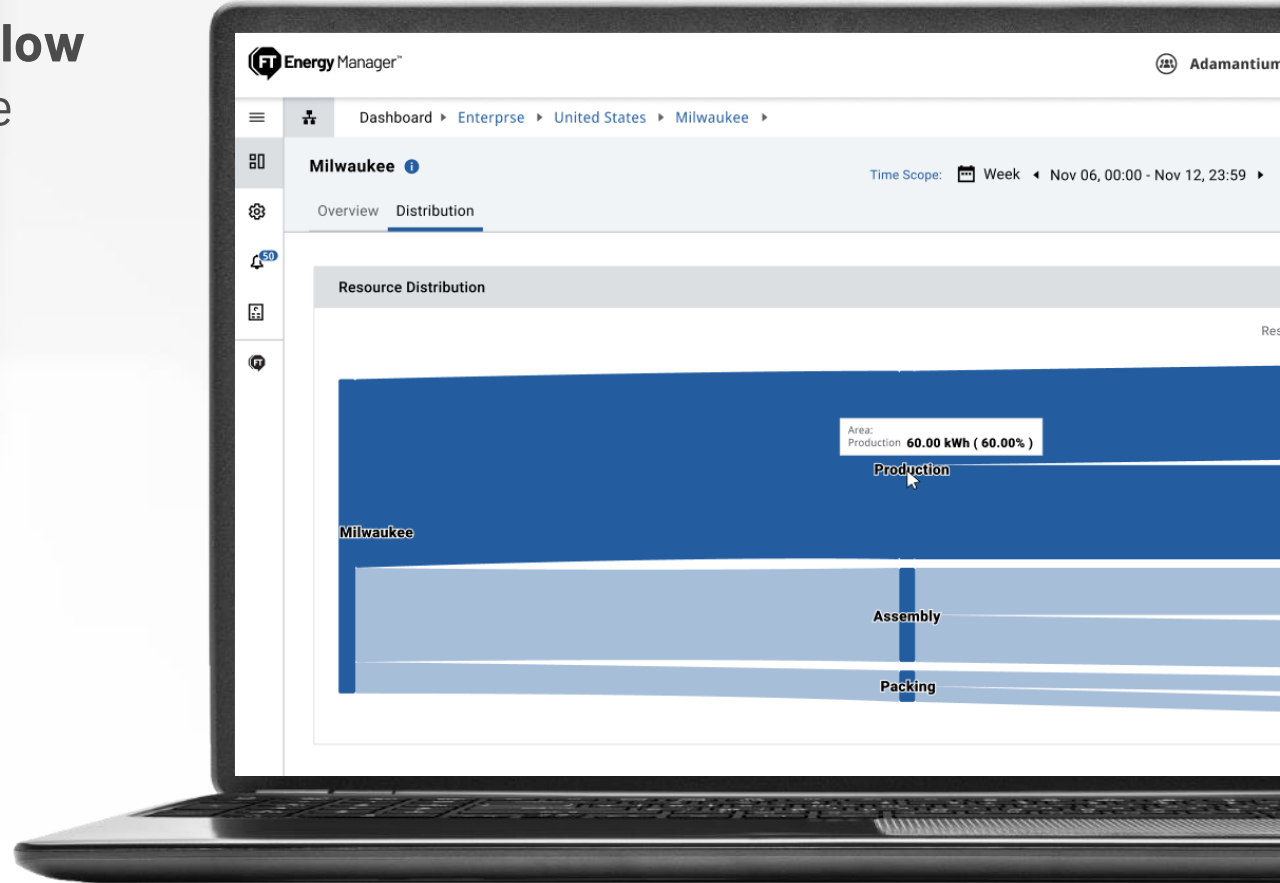
Pre-built dashboards to report on energy performance indicators

Report on Scope 1 and Scope 2 emissions

- Understand **carbon intensity** and report on the amount of emissions (CO_2e) per resource type (CO_2e per kWh)

- Report on **total carbon emissions** resulting from energy consumption over a specific time scope

- Ability to track and analyze emissions against time and understand **total emissions with predefined time scopes**

- Configurable **emission factors** by resource type
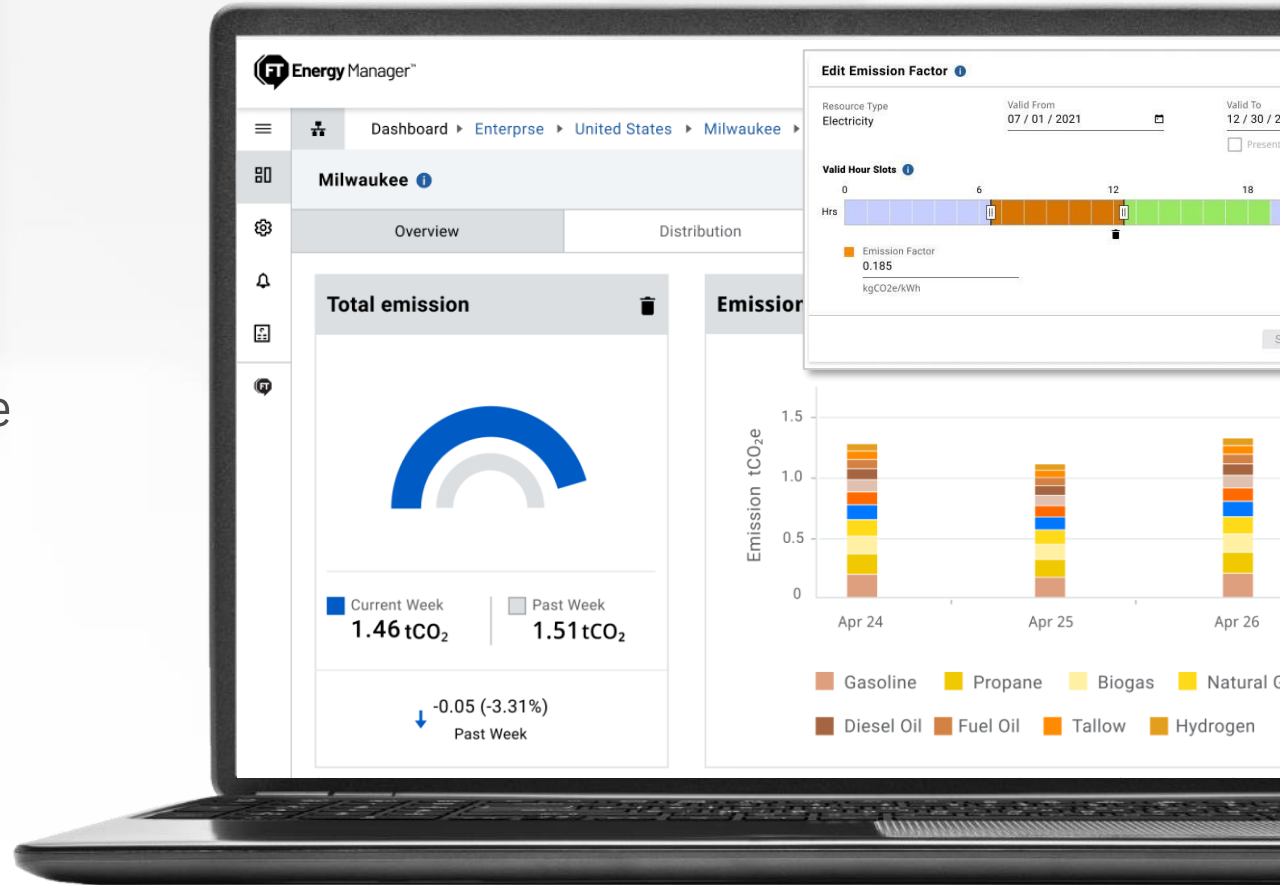
Pre-built dashboards to report on energy performance indicators

Demand or flow rate monitoring

- Continuously track and analyze the **amount of energy or flow rate at a given time** in a particular location or asset
- Understand and **identify peak**, minimum and average **demand**
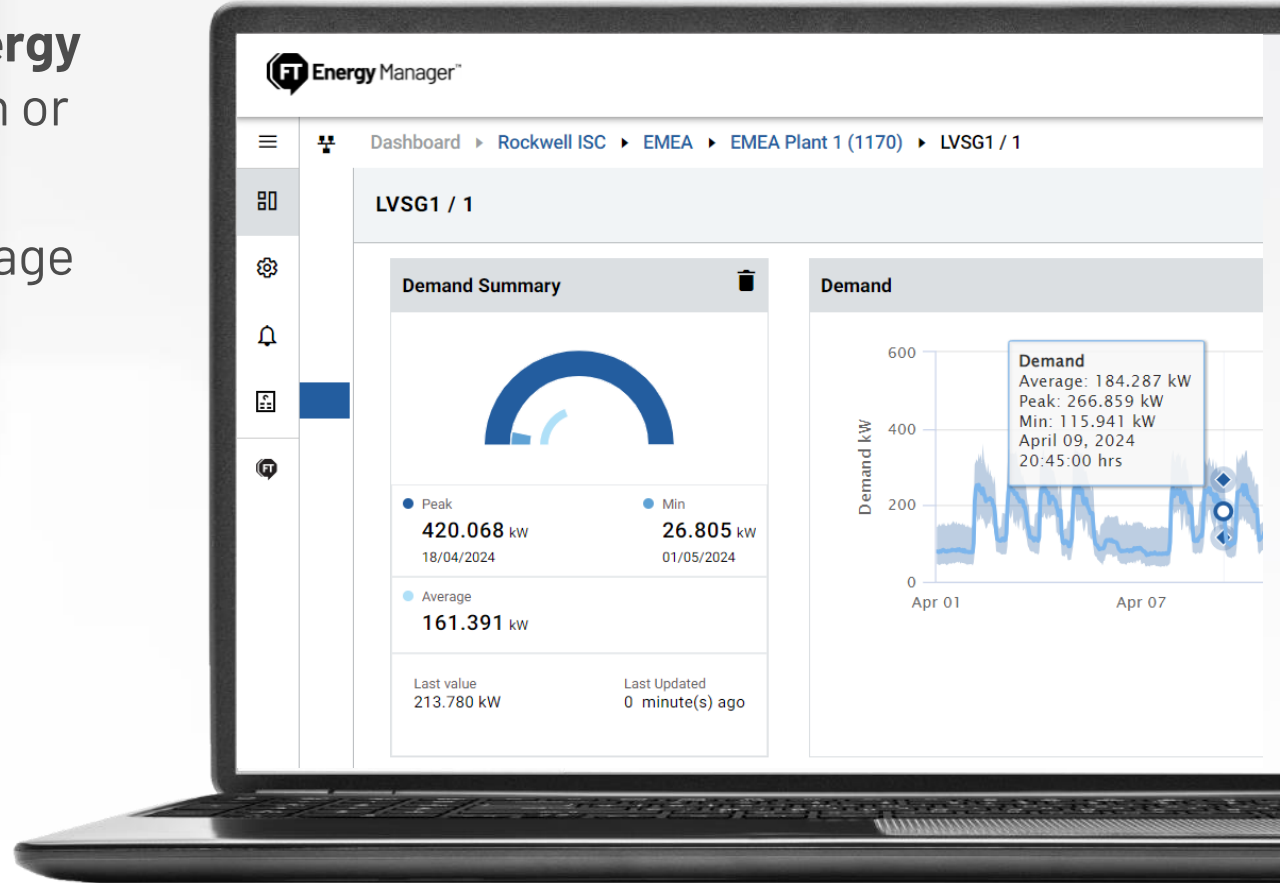
Pre-built dashboards to report on energy performance indicators

Energy cost allocation

- Understand **energy costs** at **every level** within an organization

- Analyze **energy cost by resource type**

- Easy to **configure rate schedules** for low and high tariffs
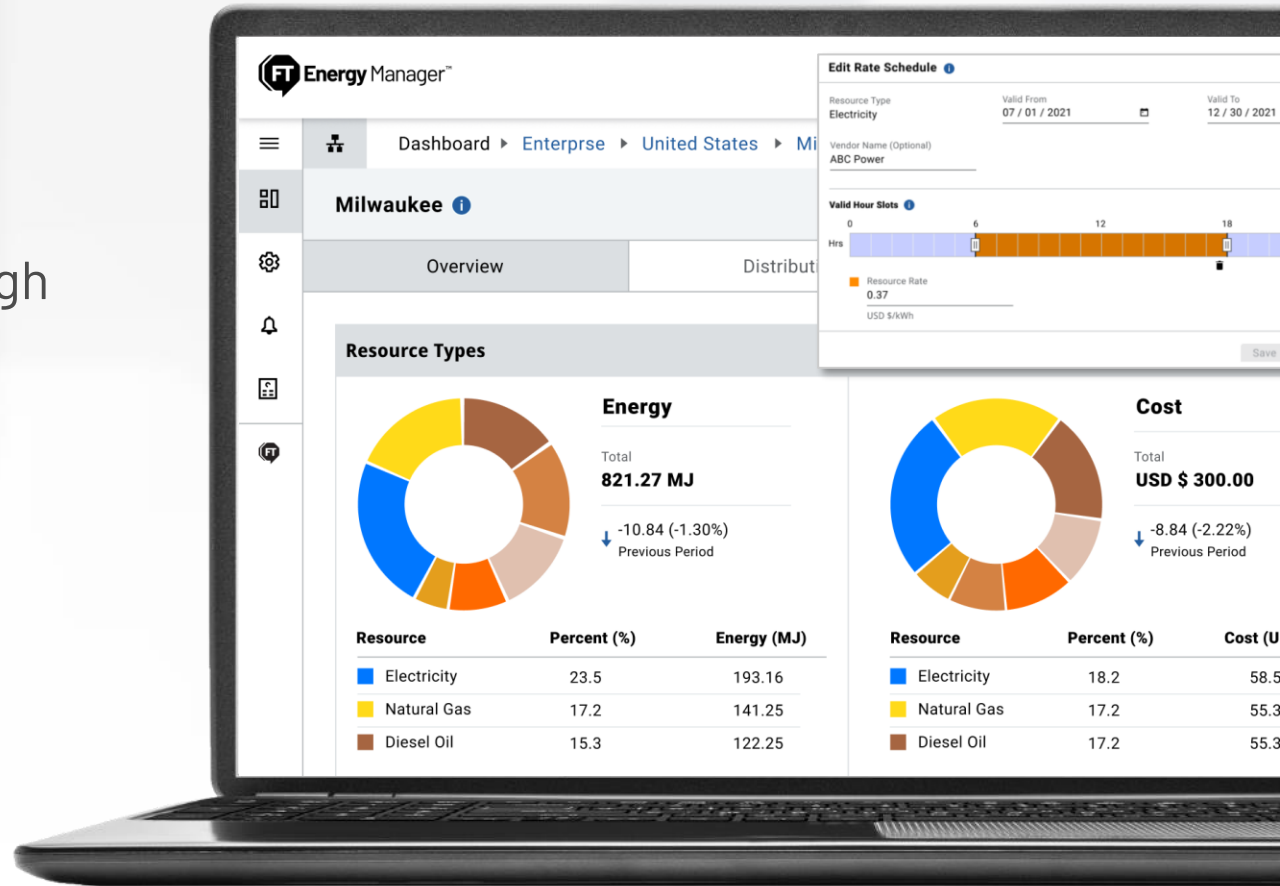
Pre-built dashboards to report on energy performance indicators

Analyze how process and environmental factors influence energy performance

- Monitor **any variables** that **affect** the **energy demand, consumption or emissions**
  - Supported process variable measurement types – temperature, pressure, volume, volume flow, mass, mass flow, energy, energy flow
- **Automatic unit conversion** and **unit harmonization**
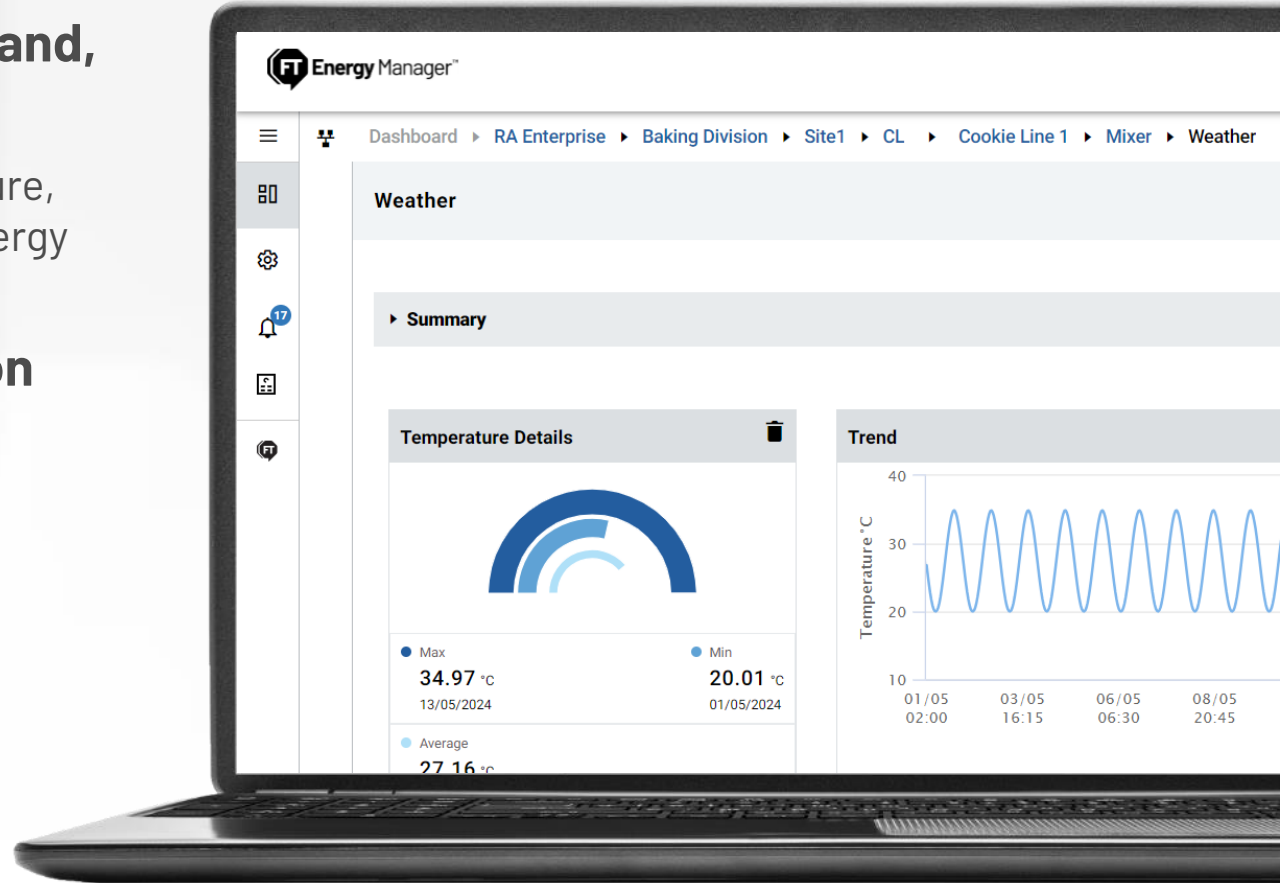
Contextualize energy data with operational technology (OT) data and understand energy intensity or emissions intensity

- Get insights **at every level** within your organization on **energy intensity**, energy consumption relative to a specific metric like **production output** and understand **how efficiently energy is being used**

- Understand **emissions intensity** or the amount of **greenhouse gas emissions produced per unit of output**

Charting and no-code analytics

On-the-fly trending and analysis

- Access contextualized data with a powerful, **no-code experience** to perform industrial **data analytics**, troubleshooting and **root cause analysis**

- Make use of the industrial data science library with pre-built calculations

- Create **public charts** that subject matter experts can share with operations and front-line workers

Alerts and notifications via email

Stay connected and notified

- **Configure thresholds** on energy performance indicators and get notifications via email
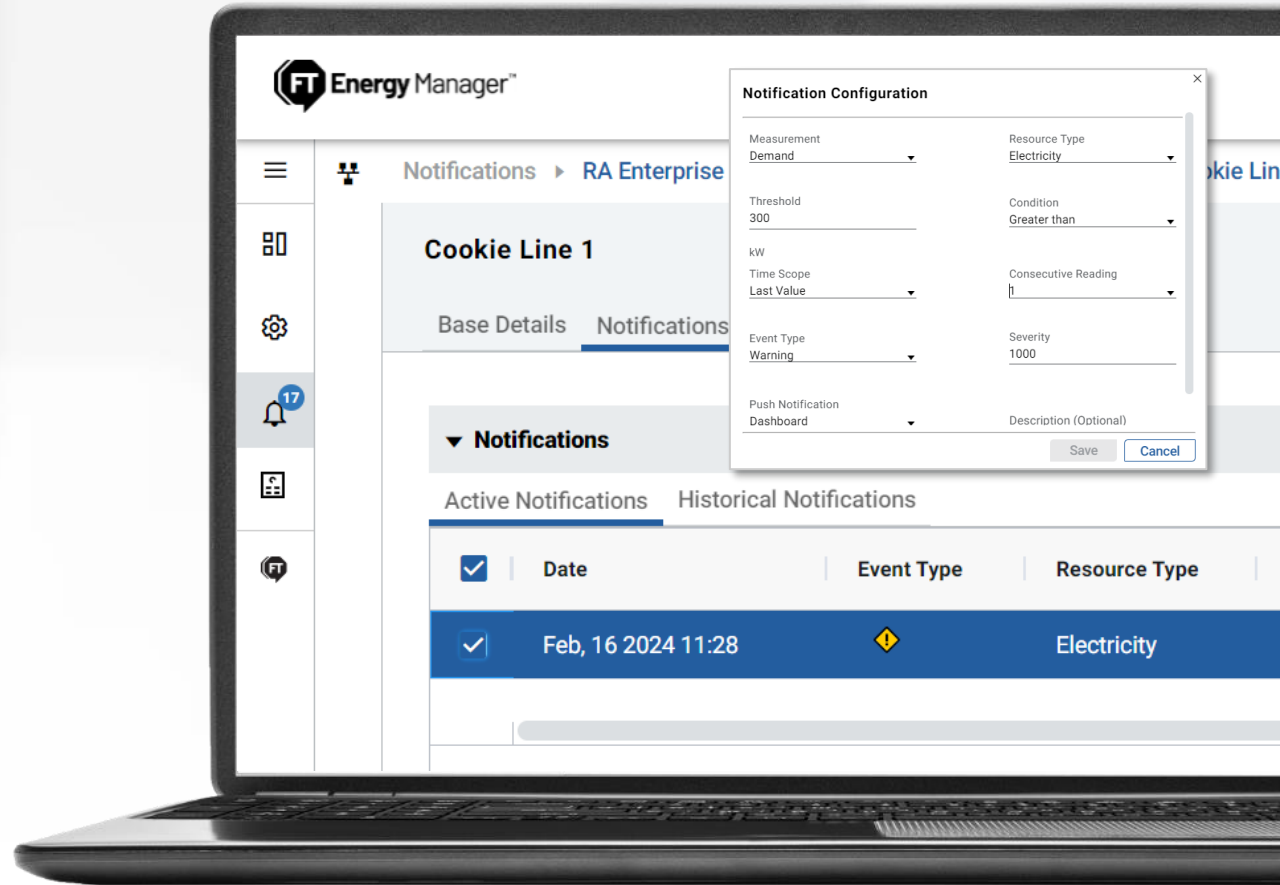
Build the foundation and accelerate the digital transformation

Connected Enterprise®
(Scalable Digital Transformation)

Traditional Approach

Application A

Application B

Application B
Application C
Application A

Data Platform

Point Solutions

Data Silos

Difficult to scale

Lower total cost of ownership

Easy to scale

Faster time-to-value

Make data valuable

Accelerate your digital transformation with industrial DataOps

FactoryTalk® DataMosaix™ SaaS enables controlled access to relevant and contextualized data. It's an industrial DataOps solution that provides flexible and scalable tools to accelerate data usability by domain experts and analysts.

Application

Energy Manager™	Other Applications	Tools	API
	Batch Performance Analytics Asset Intelligence PlantPAx® Analytics	Grafana PowerBI Jupyter Notebook	Weather Data Emissions Factors ESG Reporting

Data Platform

FT DataMosaix™

Data Extractor

OPC-UA	Historian	Database	...	...

Data Source

Linx Gateway · FT Optix · Historian SE · Batch · kepware · PLEX · File · PlantPAx Distributed Control System

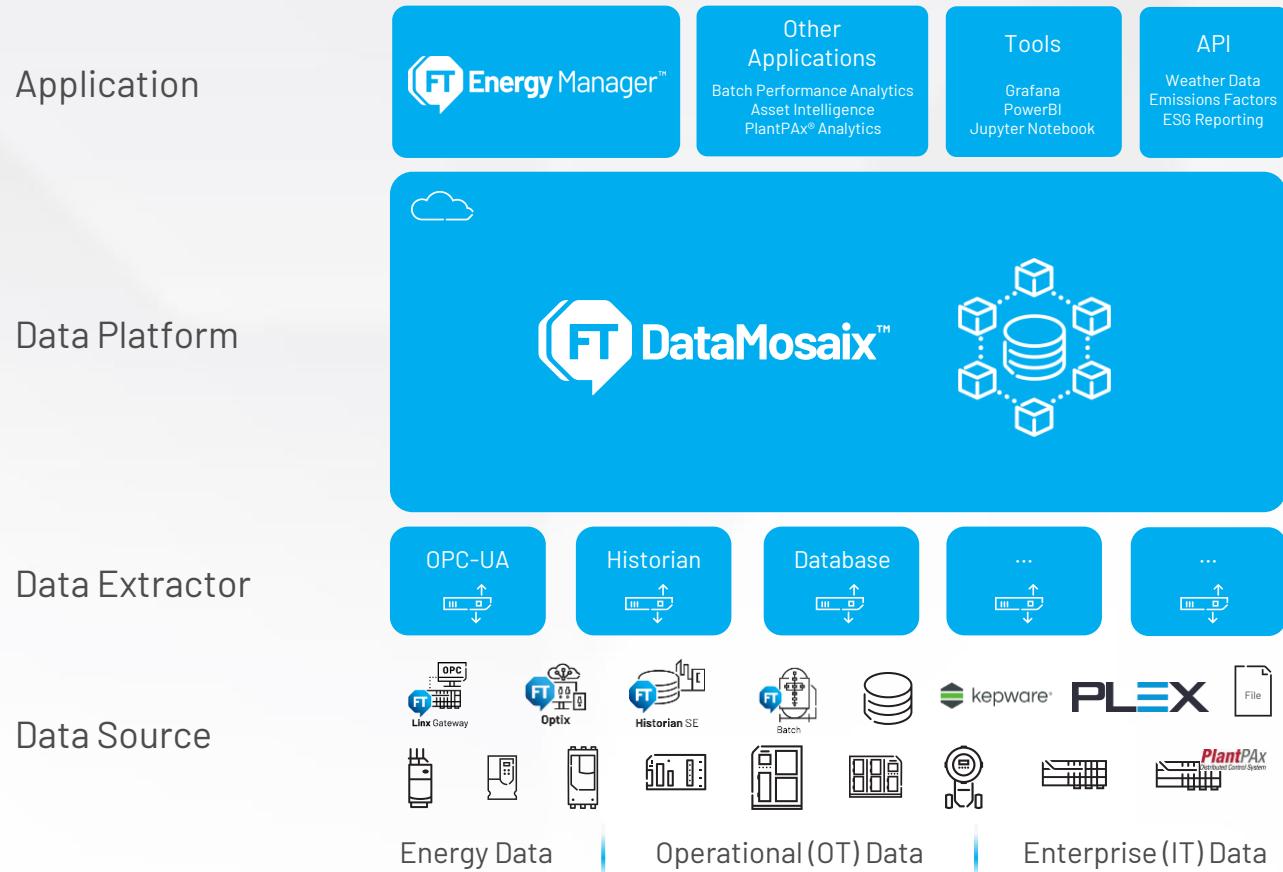Energy Data | Operational (OT) Data | Enterprise (IT) Data

- **Use Pre-built Applications** - Out-of-the-box, ready to use industrial Energy Management and Optimization application that accelerates time to value

- **Connect Industry Standard Visualization and Analytics Applications** – Extend and build custom dashboards with Grafana, PowerBI or Jupyter Notebook with the same contextualized data

- **Integrated Solution** – Exchange data via standard APIs with other services or applications to enable further use cases

- **Enable Charting and No-Code Analytics** - Access contextualized data with powerful, no-code experience to perform industrial data analytics, troubleshooting and root cause analysis

- **Automate Data Contextualization** – Deploy FactoryTalk Energy Manager faster at scale across the enterprise and create meaningful relationships between data to accelerate analytics

- **Simplify Data Connectivity** - Pre-built OT and IT data extractors to access operational, energy and process data wherever it lives

Rockwell Automation

Expose industrial data to realize value through apps and analytics

Make Data **Available**	Make Data **Meaningful**	Make data **Useful**	Make data **Valuable**

Data Sources · **Integration & Transformation** · **OT/IT/ET Contextualization Services** · **Industrial Knowledge Graph** · **Self-Service & Developer Tools** · **Applications & Data Science**

Time Series - Historian, HMI, PLC, Sensor

Structured – Alarms, OEE, MES, CMMS, QMS, ERP

Engineering- Diagrams, 3D Models, Simulation

Connectors

Manual SME
Rule-based
Custom ML-based
Pre-built ML-based

Document parsing
Entity matching
Engineering diagram parsing

Data Exploration
Flexible Data Modeling
Data Quality Monitoring
Templates & Functions
Schema Services
3D model rendering
Event-based monitoring
+++

GUI -- API -- SDKs

Charting

Industry Solution Applications

Analytics & Data Science

Data governance and quality

Marketecture and building blocks

FactoryTalk® DataMosaix™ SaaS **(Multi-tenant SaaS)**

- **1** Data Source
- **2** Industrial Connector
- **3** Software Extractor
- **4** Data Platform
- **5** Application
- **6** Infrastructure

Linx Gateway — OPC-UA

kepware — OPC-UA

Optix — OPC-UA

Historian SE

Software Extractor — HTTPS — DataMosaix™

- OPC-UA Extractor
- FactoryTalk Historian Extractor
- ODBC Extractor
- …

Multi-tenant SaaS

Rockwell Automation Managed Infrastructure
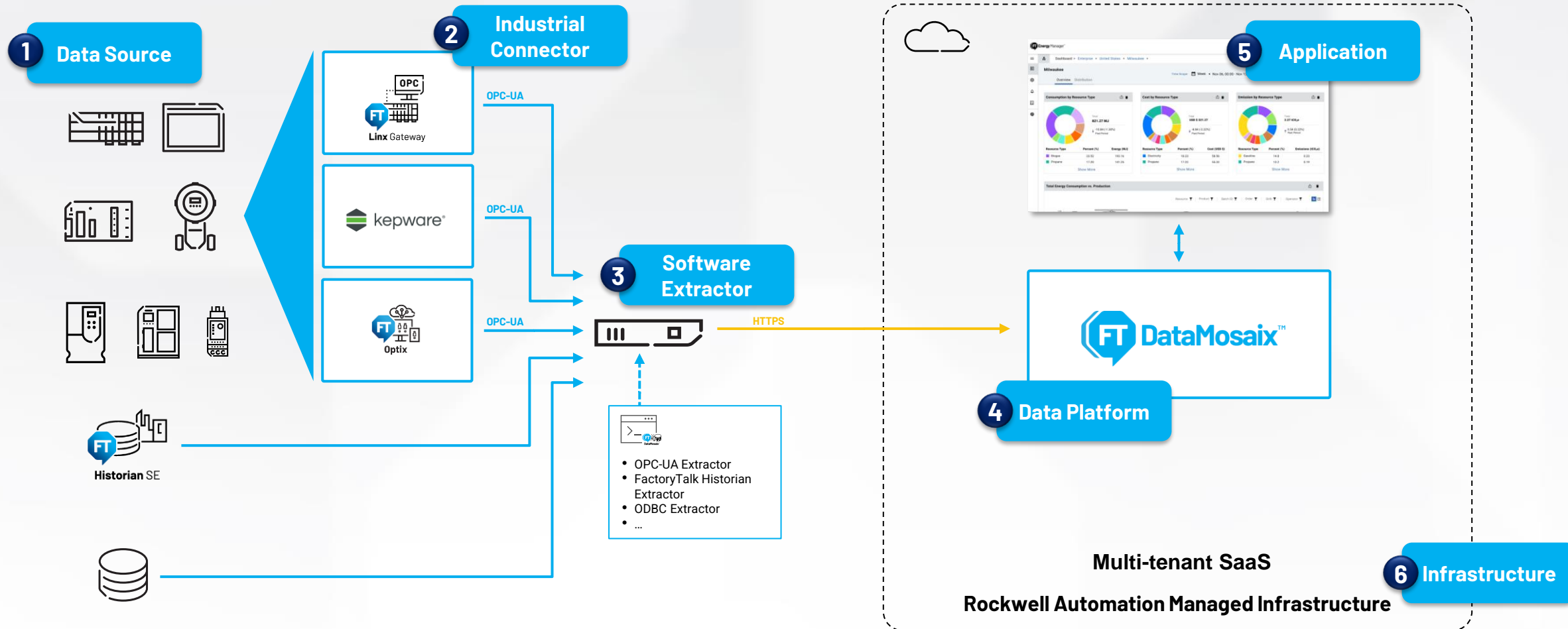
FactoryTalk® Energy Manager™ SaaS

FASTER
TIME-TO-VALUE

Reduce development time and benefit from automatic updates and product enhancements

CLOUD ESSENTIAL

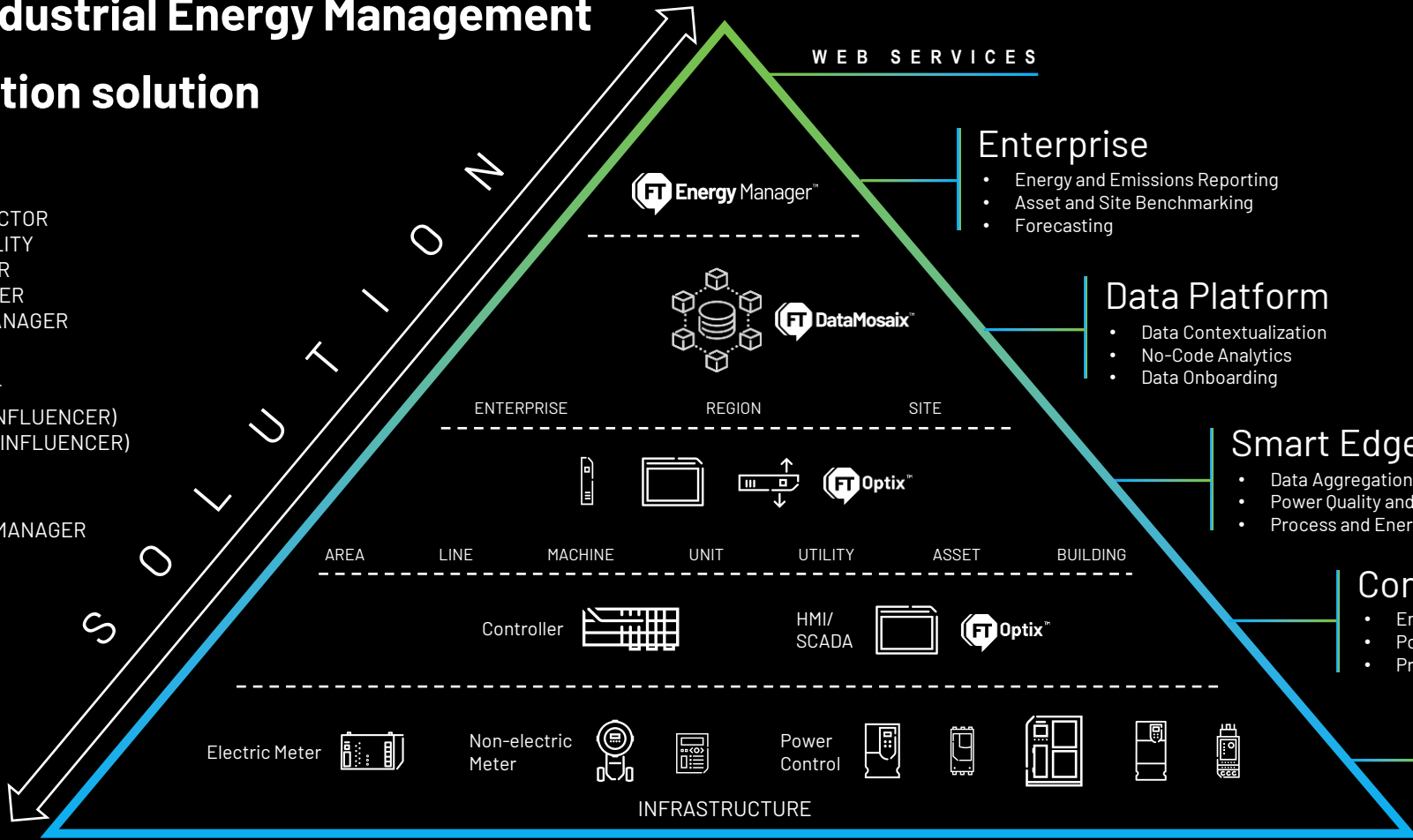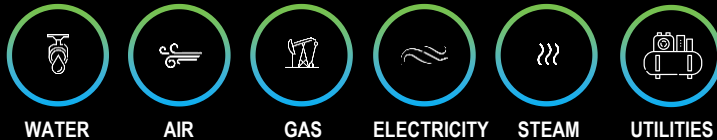Break through your data silos to make better business decisions

SCALABLE

Gain real-time insights across your enterprise and reduce complexity and lower the total cost of ownership

Rockwell Automation

Integrated industrial Energy Management and Optimization solution

Microsoft
Microsoft Sustainability Manager0

PLEX

Weather Service
Emissions Library

FT Energy Manager™

FT DataMosaix™

FT Optix™

SOLUTION

WEB SERVICES

MANAGING DIRECTOR
VP SUSTAINABILITY
PLANT MANAGER
ENERGY MANAGER
OPERATIONS MANAGER

DATA SCIENTIST
CIO MANAGER (INFLUENCER)
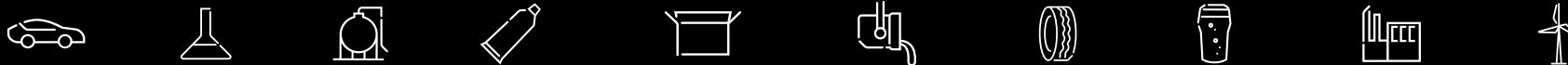CISO MANAGER (INFLUENCER)

MAINTENANCE MANAGER
OPERATOR

TECHNICIAN

FT Energy Manager™

Enterprise
- Energy and Emissions Reporting
- Asset and Site Benchmarking
- Forecasting

FT DataMosaix™

Data Platform
- Data Contextualization
- No-Code Analytics
- Data Onboarding

ENTERPRISE   REGION   SITE

FT Optix™

Smart Edge
- Data Aggregation and Data Pre-Processing
- Power Quality and Management
- Process and Energy Optimization

AREA   LINE   MACHINE   UNIT   UTILITY   ASSET   BUILDING

Controller   HMI/SCADA   **FT Optix™**

Control
- Energy Monitoring
- Power and Demand Management
- Process Control & Visualization

Electric Meter   Non-electric Meter   Power Control

Intelligent Devices
- Metering
- Power Control

INFRASTRUCTURE

ENERGY DATA
WATER   AIR   GAS   ELECTRICITY   STEAM   UTILITIES

OPERATIONAL (OT) DATA
UNIT OF OUTPUT   BATCH DATA   PROCESS DATA
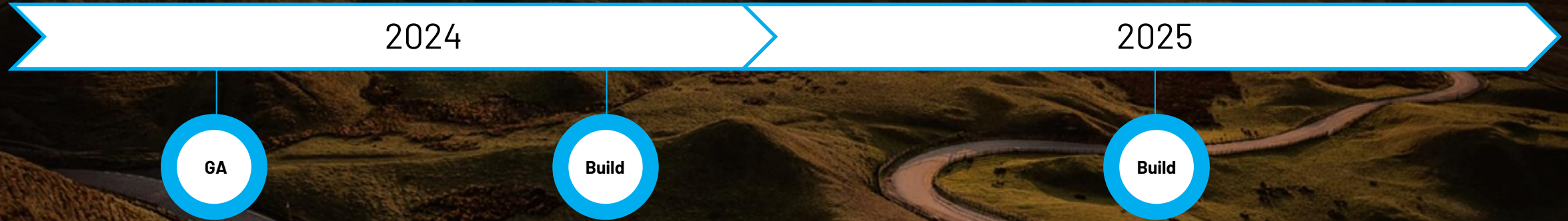
INDUSTRIES

REDUCE
Carbon intensity of fossil production

REMOVE
Carbon in the air and capture emission

USE LESS
Energy through efficiency and optimization

ACCELERATE
Renewable & Low Carb Energies

Rockwell Automation

Outcome-based roadmap

2024 | 2025

GA   **Build**   **Build**

Capabilities:

- Foundational architecture
- Core EMS capabilities
- Monitoring of the key energy performance indicators

- Energy distribution dashboard
- Energy baseline, targets and savings
- Advanced energy data contextualization
- Power quality monitoring
- Energy efficiency and performance of utilities
- Advanced GHG reporting

- Energy performance and emissions prediction
- Energy performance correlation
- Anomaly detection root cause analysis
- Power generation and renewables
- Energy generation and demand optimization
- Advanced cost/billing

Infrastructure Options

SaaS
(Multi-tenant SaaS)

Private Tenant

Private Cloud

On-Premise

FactoryTalk® DataMosaix™
SaaS

Rockwell Automation Managed Infrastructure

FactoryTalk® DataMosaix™
Private Cloud

Customer Managed Infrastructure