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Bentley Infrastructure Cloud for Energy

Insights Into **Infrastructure Intelligence**

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Better Outcomes Across the Infrastructure Lifecycle

Behind every infrastructure project and every physical asset is data waiting to be unlocked, unleashed, and illuminated, resulting in insights into infrastructure intelligence.

From connecting critical information and workflows across the infrastructure lifecycle to leveraging artificial intelligence-driven insights, infrastructure intelligence is how you can build a more sustainable and resilient future.

Whether you need to:

- Rapidly generate different design concepts based on a range of inputs and constraints,
- Create immersive 3D environments of infrastructure assets where construction progress is captured, current, and actionable,
- Or automatically know when something is wrong with the health or safe operability of your assets,

Infrastructure intelligence is the key to solving and overcoming some of today's biggest challenges.

Infrastructure Lifecycle Challenges

Design and build firms, infrastructure owners, and their supply chain stakeholders must effectively manage infrastructure projects and assets across the lifecycle from design and build into operations.

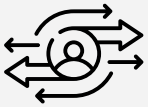
These teams need to:

Increase the efficiency of designing, building, and operating infrastructure due to the increasing complexities of increased client demands and workforce challenges.

Manage and govern data to support collaboration workflows for engineering, construction, and asset performance within and across organizational boundaries.

Manage the flow of information in and between organizations for efficient design, construction, and operations, with effective coordination of work between many different teams.

Utilize trustworthy and actionable asset data to **make better-informed decisions**.



Leverage data from engineering technology, information technology, and operations technology (ET, IT, and OT) to improve project delivery and asset performance.

Improve asset performance and reliability with a single, holistic, and up-to-date view.

Challenges in the Energy Industry

Much of the infrastructure that makes up electrical grids is **old and outdated**.

This weakness makes grids even more **vulnerable to the intense weather conditions** brought on by climate change.

Moreover, electric grids were largely built to bring energy from where electricity is generated, typically by fossil fuels, to where electricity is consumed.

With the increase of renewable energy sources, coupled with the new types of demands for electricity, such as electric vehicles, the grid's original underlying purpose is **quickly becoming outdated**.

Massive **change in investments** for infrastructure, people, process, and technologies are needed to make electrical grids cleaner and greener.

But **funding for vital changes continues to be challenging**. And public utilities need hard numbers to justify the rate recovery increases that fund grid upgrades.

How Bentley Infrastructure Cloud Can Help

Bentley Infrastructure Cloud brings teams, projects, and asset data together in secure managed environments to execute work, resulting in better outcomes across the infrastructure lifecycle. It offers purpose-built workflows for users across all phases of the asset lifecycle. Powered by the iTwin® Platform, seamlessly integrated with Bentley Open applications, and providing common data environments, Bentley Infrastructure Cloud delivers project delivery, construction management and asset performance capabilities through three key applications:

- **ProjectWise®,** which provides a connected data environment to help designers and engineers produce higher quality digital deliverables.
- **SYNCHRO™,** which enables constructors to simulate plans in 4D and capture as-built progress for digital twin handover.
- **AssetWise,** which empowers owners with asset lifecycle information within evergreen digital twins to help improve the reliability, performance, compliance, and safety of their infrastructure assets.

Bentley Infrastructure Cloud Benefits

Bentley Infrastructure Cloud is your ultimate destination for managing infrastructure data that can be relied on to make informed decisions, allowing you to better design, build, and operate more sustainable infrastructure.

Bentley Infrastructure Cloud:

- Manages the flow of information throughout the lifecycle in a trusted environment to efficiently and effectively collaborate across team and organizational boundaries.
- Provides governance through an open, federated environment to ensure that the right people have the right information at the right time, giving users the ability to create, edit, view, search, analyze, manage changes, and share asset and project information according to their function or need.
- Unlocks value with open access to data across the lifecycle by enabling the reuse of best practices and implementation of standards, helping you gain new insights through change management.
- Augments existing file-based workflows with data-centric workflows enabled by the iTwin Platform to streamline change management.

Use Cases

Bentley users are working on innovative projects that use data in groundbreaking ways. They see clear strategies for accelerating infrastructure intelligence, including reusing digital components and incorporating operational data from IoT sensors and drones into evergreen digital twins.

Image courtesy of MCC Capital Engineering & Research Incorporation Limited.

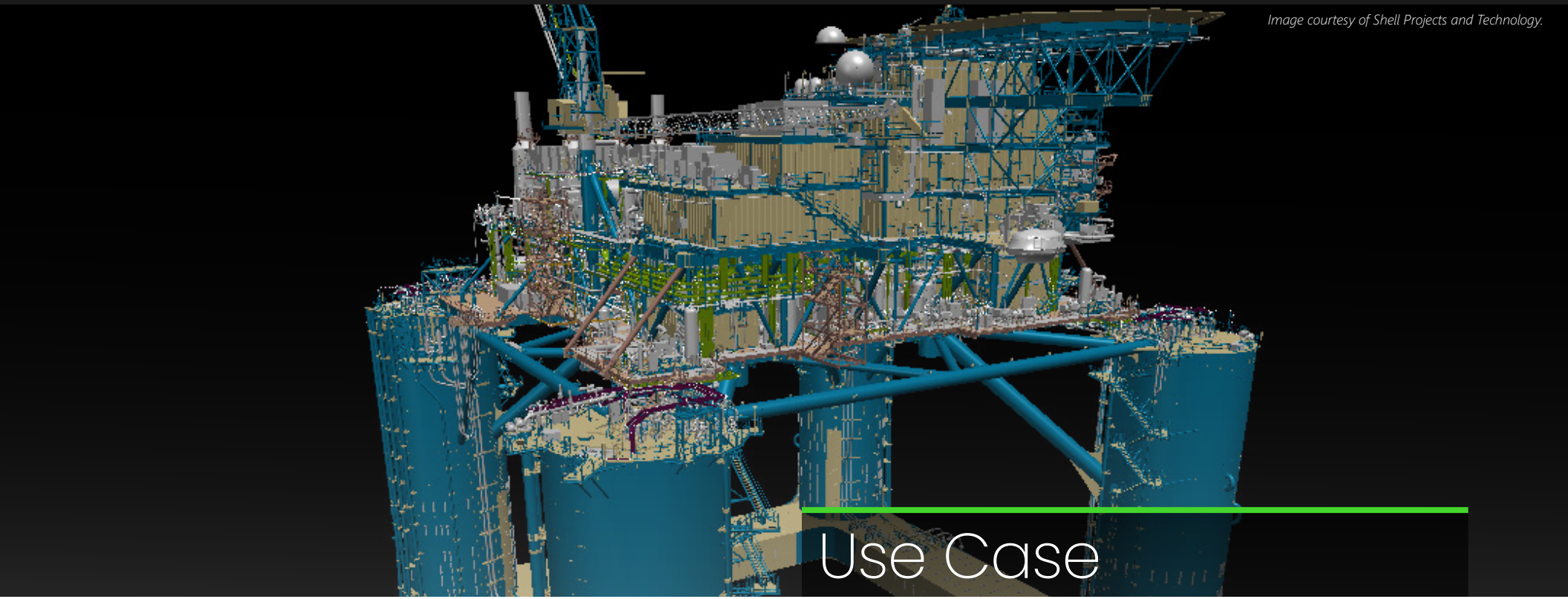


Image courtesy of Shell Projects and Technology.

Use Case

Deepwater Project Delivery Digital Platform

Shell identified a portfolio of projects in the Gulf of Mexico for deploying an integrated project delivery digital platform, continuing top cost performance while working towards meeting net-zero carbon goals and further improving project cycle times for deep water projects. This end-to-end digitization from concept design, to handover, to operations presented challenges, including integrating multisourced data. To achieve their goal, Shell needed open, interoperable technology applications.

Leveraging PlantSight, along with Bentley Infrastructure Cloud's build (SYNCHRO) and operate (AssetWise) capabilities, Shell developed a digital platform that provides a single source of truth throughout the project lifecycle. Working in a digital environment optimizes data access, visualization, and remote collaboration, which improves efficiencies, reduces the time for project teams to find information by 50%, and eliminates work duplication. Shell expects to see significant productivity gains and cost savings. The digital twin solution can be scaled as projects expand or new ones arise.


Image courtesy of Inner Mongolia Electric Power Survey and Design Institute Co.,Ltd.

Use Case

Application of Digital Design in the Wuda North 550kV Substation

The Wuda North 550-kilovolt substation is situated on the edge of a planned urban area in the Wuda District. With multiple disciplines and stakeholders involved, the project presented data integration and coordination challenges compounded by requirements to optimize resources and minimize costs. Many engineers were working in different design platforms, and there were verification issues between the 2D drawings and 3D models. Therefore, the project team sought to establish a collaborative digital design environment to meet design and delivery demands.

Leveraging Bentley Infrastructure Cloud's design (ProjectWise) capabilities with Bentley Open applications, Inner Mongolia Electric Power Survey and Design Institute created a connected digital design system, streamlining workflows and reducing errors to shorten the design time. The collaborative digital design solution rationalized site layout, reduced land acquisition, and minimized the footprint of the project. Performing clash detection and construction simulation with Bentley Infrastructure Cloud's build (SYNCHRO) capabilities eliminated errors during construction.


Image courtesy of Capital Engineering And Research Incorporation Ltd.

Use Case

60MW Subcritical Blast Furnace Gas Power Generation Project

The Jiangsu Longteng special steel 60-megawatt project is the world's first ultra-high-pressure, subcritical gas generator set with the smallest installed capacity. Capital Engineering & Research Corporation undertook design and construction and faced technical and coordination challenges compounded by a short timeline and limited space.
To prevent clashes and simultaneously construct the physical factory and its digital twin, they needed to use open modeling applications in a connected data environment.

Leveraging Bentley Infrastructure Cloud's design (ProjectWise) and build (SYNCHRO) capabilities to establish a collaborative design platform, they were able to reduce design errors, and perform construction simulation, optimizing construction. With Bentley's openness, they built a digital model of the entire factory with an engineering data center to achieve digital delivery based on full lifecycle information, establishing the foundation for intelligent plant operations. They reduced the cost of steel while also reducing gas emissions by 1.4 million cubic meters.

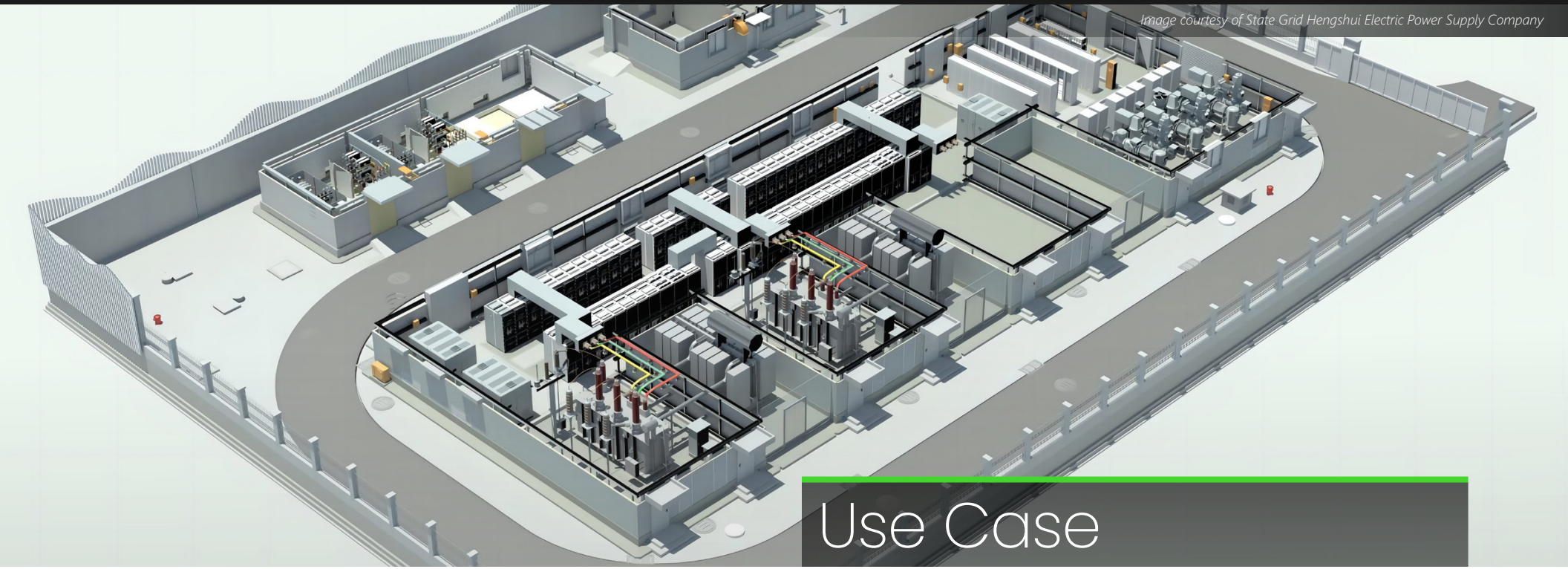


Image courtesy of State Grid Hengshui Electric Power Supply Company

Use Case

Intelligent Construction via BIM Technology for 110kV Power Transmission and Transformation Project

Located in Hengshui, this downtown park electric substation project includes two main transformers with a capacity of 100,000 kilovolt-amperes. Upon completion, it will improve the area's grid structure, strengthening power supply and promoting local economic development. Involving 19,023 electrical parts and multiple disciplines, the project presented technical and coordination challenges, compounded by demands to meet digital delivery, operations, and maintenance requirements. The team needed an integrated, comprehensive BIM technology solution.

Leveraging OpenBuildings and OpenUtilities Substation, State Grid Hengshui Electric Power Supply Company implemented collaborative BIM design workflows, facilitating collision detection, and optimizing design to reduce design changes by 14 times, saving CNY 3.21 million. Integrating Bentley Infrastructure Cloud's build (SYNCHRO) capabilities and smart modular construction by establishing a digital twin with low-carbon technology shortened the construction period by nearly four months and reduced carbon emissions by 59.96 tons.


Image courtesy of Suncor Energy, Inc.

Use Case

Asset Data Lifecycle Program

Suncor Energy Inc., a Canadian energy company, continually strives to improve energy efficiency and facility treatment processes to minimize environmental impact. Aligned with their mission, they saw an opportunity to improve asset information management at their largest and most complex facility. To improve data reliability and integrity, they sought to shift from a document-centric approach to an asset-centric program, requiring a cloud-based technology solution to achieve their goal.

Leveraging Bentley Infrastructure Cloud's operations (AssetWise) and design (ProjectWise) capabilities as the basis for their Asset Data Lifecycle Program, they were able to streamline asset information management capabilities and provide data that is simpler, more reliable, and more accessible. Working in a cloud-based environment, they are decommissioning their on-site IT infrastructure, reducing related support costs. The technology solution has the potential to save approximately CAD$ 12.4 million over a five-year period and the enhanced data will help improve asset performance.

It All Starts with Data

What the most advanced firms are already doing today:

Lighting up their dark data

Reusing data through **seamless interoperability** across applications, throughout the infrastructure lifecycle

Enjoying a **consistent** UX

Realizing the **value** of that data beyond handover

Monetizing newly uncovered **digital integration** business opportunities

Bentley Infrastructure Cloud...

- **Allows you to manage and leverage all your engineering data,** maximizing its potential for generative artificial intelligence.
- **Unifies digital project deliverables and enhances model-centric workflows** with smart sheets, enabling 2D/3D hybrid workflows and connecting traditional file-based and BIM data-centric workflows to deliver value faster.
- **Embodies Bentley's commitment to openness and interoperability** with industry standards, including IFC, BCF, CFIHOS, Mimosa, DEXPI, and third-party file formats.

Contact us for Better Outcomes Across the Infrastructure Lifecycle

Learn More