



EBOOK

Powering the Future of Energy and Utilities in Australia and New Zealand

From Operational Data Complexity to Reusable, Trusted
Data Products



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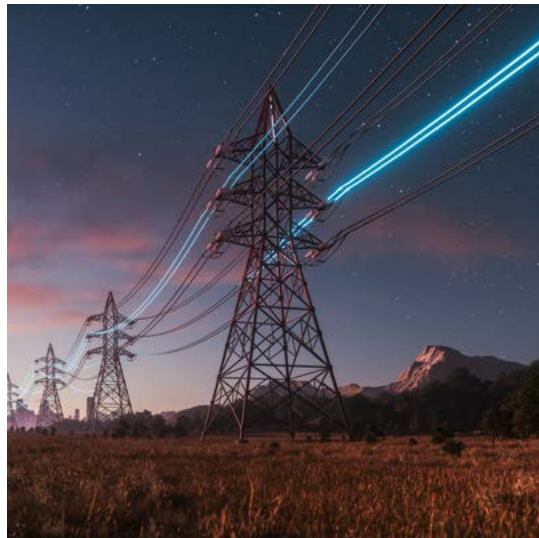
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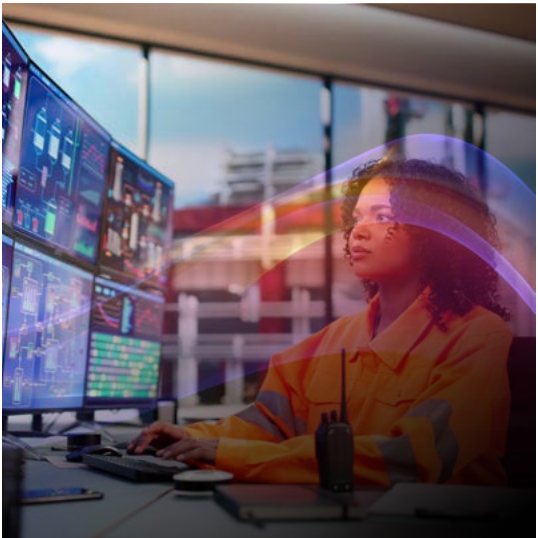
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CHAPTER 1:

THE ENERGY AND UTILITIES REALITY IN AUSTRALIA AND NEW ZEALAND

Energy and utilities organisations in Australia and New Zealand operate in an environment defined by operational complexity rather than centralisation.¹ Highly distributed electricity networks, significant gas consumption, increasing renewable penetration, volatile wholesale markets, and growing water constraints, all place pressure on day-to-day operations.²

Utilities must simultaneously manage grid reliability, market exposure, asset-intensive infrastructure, ESG and regulatory obligations, and rising customer expectations.³ These challenges are amplified by extreme weather events, ageing infrastructure, and the rapid growth of distributed energy resources such as rooftop solar, batteries, and electric vehicles.⁴

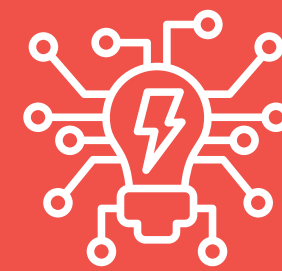
While data is abundant across SCADA systems, energy management platforms, market systems, asset registers, customer platforms, and sustainability tools, it is often fragmented or duplicated. This limits its usefulness for real-time operational decision-making.⁵

To succeed, utilities need a data approach that supports **real-time operations, regulatory confidence, and reuse across teams**, rather than one focused solely on centralised analytics.

CHAPTER 2:

WHAT LOGICAL DATA MANAGEMENT MEANS FOR ENERGY AND UTILITIES

Logical data management provides a practical way to access, combine, and govern data across complex energy environments without forcing all data into a single physical platform.⁶





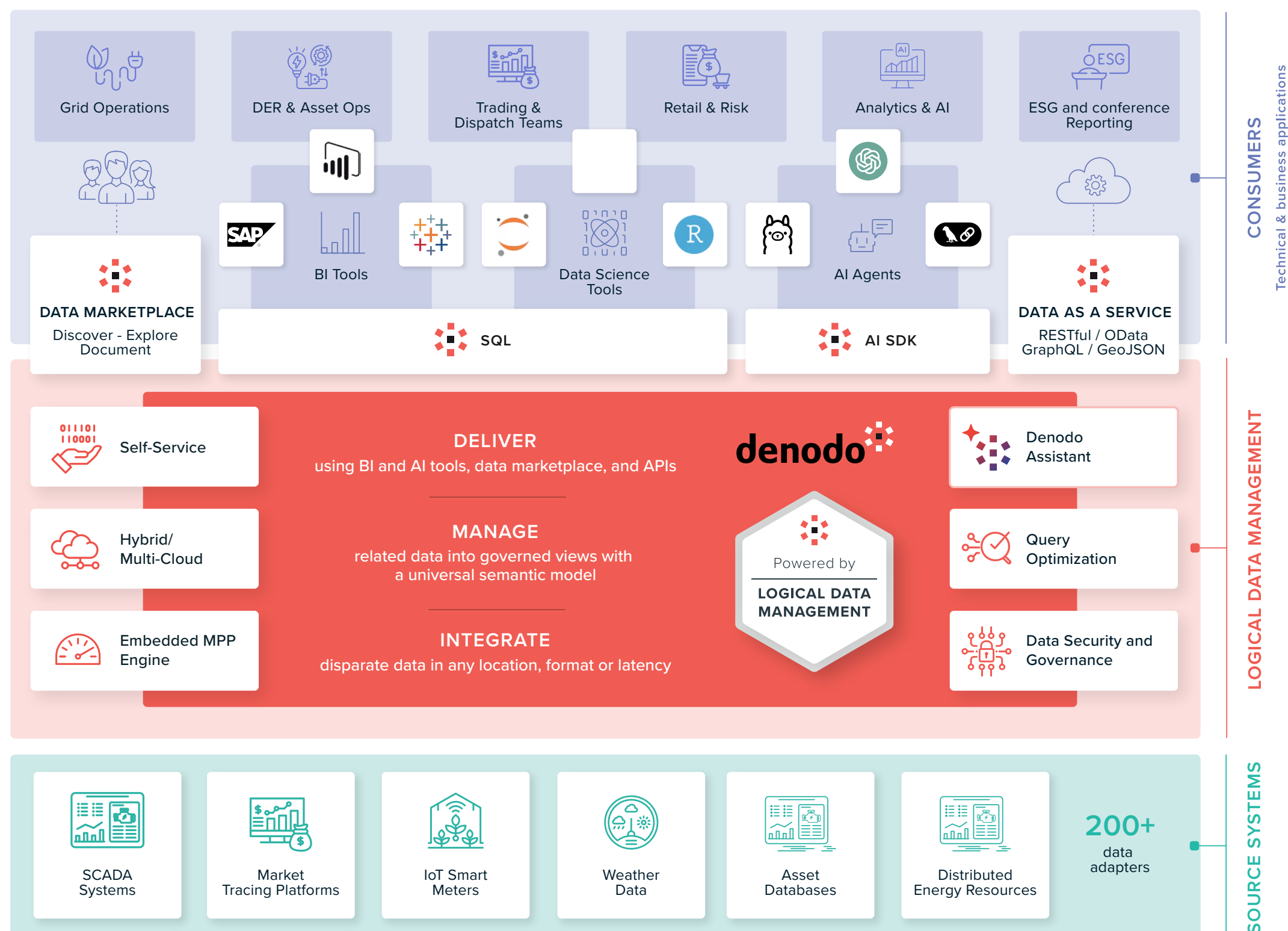
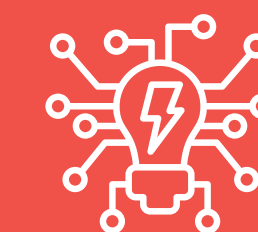
Rather than moving data by default, a logical approach creates a **virtual data layer** across existing systems, including operational technology (OT), enterprise IT systems, market platforms, cloud analytics environments, and external data sources. Data remains in its system of record while being accessed and governed centrally.⁶

For Australian and New Zealand utilities, this approach is particularly relevant because:

- OT systems such as SCADA and control platforms are often restricted from large-scale replication⁷
- Regulatory and cyber-security requirements limit data movement⁸
- Latency matters for operational and market decisions⁹
- Modernisation must occur incrementally, without disrupting critical operations¹⁰

Logical data management complements data lakehouses and analytics platforms by enabling value before large-scale ingestion, while still enabling data to be persisted when required for performance or regulatory reasons.⁶





Top: Secure Data Delivery

Governed data is delivered via SQL, APIs, and data services to diverse stakeholders including Grid Operations, DER & Asset Ops, Trading & Dispatch Teams, Retail & Risk, Analytics & AI, and ESG and Conference Reporting teams. Reusable energy data products can be securely discovered and consumed through these standard interfaces.

Middle: Denodo's Logical Data Layer (The Core)

The platform integrates, manages, and delivers data across operational and enterprise systems without forcing data into a single physical platform. It creates a governed logical layer — incorporating Semantic Unification, Query Optimization, and Data Security & Governance — to transform disparate data into reusable energy data products.

Bottom: Diverse Energy Source Systems

Data remains in source systems including SCADA Systems, Market Trading Platforms, IoT Smart Meters, Weather Data, Asset Databases, Distributed Energy Resources, and ESG systems. With 200+ data adapters, Denodo connects to any location, format, or latency.

OUTCOME: Reusable Energy Data Products

Governed, reusable energy data products are made securely available across the enterprise for consumption by grid operations, trading and dispatch, retail, analytics, AI, and compliance teams through standard interfaces such as SQL, APIs, and data services.

RESULT: Operational Agility

This approach supports real-time operations, regulatory reporting, and analytics, while maintaining control over data location, security, and access — without forcing data into a single physical platform.

CHAPTER 3:

FROM DATA ASSETS TO REUSABLE DATA PRODUCTS

Utilities generate many valuable **data assets**, but operational value is realised when those assets are transformed into **reusable data products**.¹¹

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DATA ASSETS

Typical energy and utilities data assets include:

- SCADA telemetry and alarms
- Smart meter and interval consumption data
- Asset condition, inspection, and maintenance records
- Market prices, dispatch signals, and forecasts
- Fuel usage, water consumption, and emissions data

DATA PRODUCTS

Data products are curated, governed combinations of data assets that are:

- **Discoverable** through a data marketplace
- **Reusable** across multiple teams and use cases
- **Governed** once and consumed many times
- **Delivered** with consistent definitions, access controls, and quality rules¹¹

EXAMPLES OF ENERGY AND UTILITIES DATA PRODUCTS



Grid Operations & Resilience

Combines SCADA telemetry, asset health, network topology, and weather data for outage management and operational control.

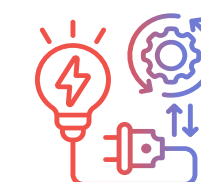
Used by: Network operations, field crews, reliability teams.



Market & Dispatch Intelligence

Integrates market prices, generation availability, fuel constraints, and forecasts to support trading and dispatch optimisation.

Used by: Trading desks, generation planners, risk teams.



Distributed Energy Operations

Unifies rooftop solar output, battery availability, feeder constraints, and demand forecasts for smart grid management.

Used by: Distribution planning and DER operations teams.



ESG & Regulatory Compliance

Brings together emissions, generation mix, fuel and water consumption, and financial attribution for audit-ready reporting.

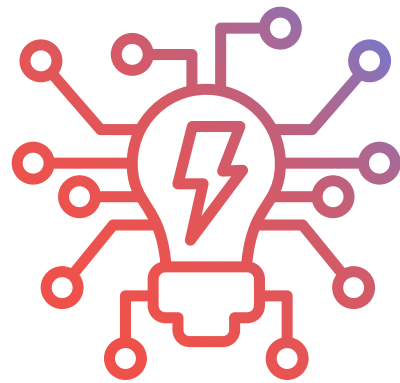
Used by: Sustainability, finance, and compliance teams.

Logical data management enables these products without duplicating data for each initiative, accelerating delivery and reducing operational risk.⁶

CHAPTER 4:

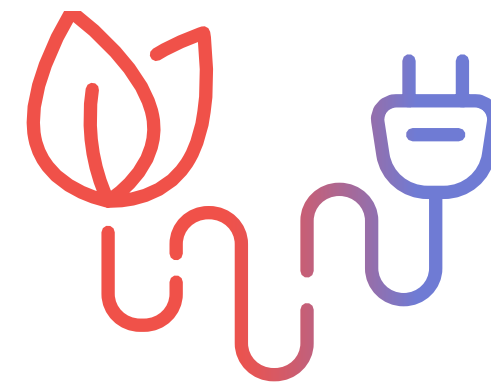
HIGH-IMPACT USE CASES ACROSS ELECTRICITY, GAS, AND WATER





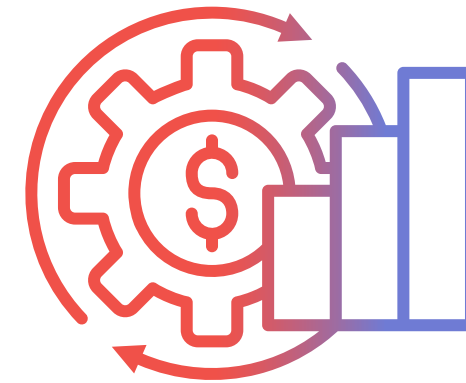
Grid Operations and Outage Management

Utilities must respond rapidly to faults, extreme weather, and network stress. A Grid Operations & Resilience data product enables real-time access to operational data alongside asset and environmental context, improving fault isolation, reducing outage duration, and supporting safer field operations.



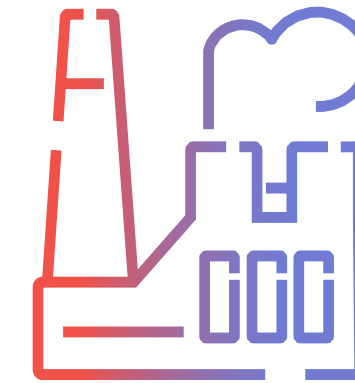
Renewable Integration and Smart Grid Operations

High levels of distributed generation require visibility beyond traditional substations. A Distributed Energy Operations data product supports hosting-capacity analysis, congestion management, and flexible resource coordination, reducing curtailment and deferring network upgrades.



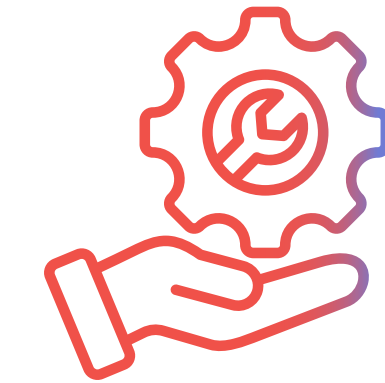
Market Trading and Dispatch Optimisation

Wholesale market volatility places pressure on trading and dispatch teams. A Market & Dispatch Intelligence data product provides timely access to operational and market data, supporting informed bidding decisions and improved risk management.



ESG, Carbon, and Regulatory Reporting

Environmental and regulatory obligations increasingly depend on operational data. An ESG & Regulatory Compliance data product enables consistent, auditable reporting by integrating emissions, fuel, water, and generation data with financial context.

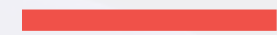


Retail and Customer Operations

Retailers face churn, billing scrutiny, and growing demand for distributed energy offerings. A Customer Energy & Engagement data product supports accurate billing, targeted offerings, and improved customer experience by unifying usage, tariff, DER participation, and service history data.¹²

CHAPTER 5:

CUSTOMERS



VTTI – Enabling Reusable Data Products Across Global Energy Infrastructure

VTTI is a global energy infrastructure company operating storage terminals and logistics assets across five continents. As its operations expanded, VTTI faced challenges integrating data distributed across terminal management systems, asset databases, trading platforms, and enterprise applications. Operational and reporting teams required consistent access to real-time data, but fragmentation — particularly between operational technology (OT) data like jetty information and vessel movements and information technology (IT) systems — made this difficult.

VTTI implemented the Denodo Platform as a logical data management layer to virtualize data across existing systems. This enabled VTTI to create reusable, governed data products without moving data from its source.



VERIFIED IMPACT & METRICS:

- ✓ **Operational Quality:** With improved operational data consistency and integrity, Customer Services saw 3.6% fewer faulty orders on a monthly basis.
- ✓ **Speed to Insight:** It took just two weeks to create and publish a data model to Power BI (integrating jetty/ vessel data), compared to an estimated two months using traditional integration methods.
- ✓ **Predictive Capability:** The platform enabled VTTI to link operational, maintenance, and financial data to perform preventive maintenance and identify equipment outliers before failure.¹³

Top-25 Fortune Global 500 energy producer

A Top-25 Fortune Global 500 energy producer, one of the "seven supermajors," faced challenges managing data across large-scale projects in oil and gas exploration (E&P) as well as new energy initiatives like wind and solar. Data was distributed across operational systems and multiple Electronic Document Management Systems (EDMS) spanning on-premises and public cloud environments. This fragmentation made it difficult for project teams to access consistent data and metadata across different project phases.

The company deployed the Denodo Platform as a logical data management layer to virtualize data across operational, enterprise, and document systems.

VERIFIED IMPACT & METRICS:

- ✓ **Unified Access:** Created a secure, common data layer that provides a **single source of truth** for technical and operational data across 130+ countries.
- ✓ **Metadata Integration:** Successfully integrated **metadata from document management systems**, enabling users to query structured data alongside unstructured project documentation.
- ✓ **Global Governance:** Established a common data model that supports consistent governance across both traditional oil & gas assets and the company's transition to renewable energy.¹⁴

CHAPTER 6:

WHY DENODO FITS AUSTRALIA AND NEW ZEALAND'S ARCHITECTURE REALITY

Denodo's logical data management capabilities are designed for the operational, regulatory, and architectural constraints common in Australian and New Zealand utilities.



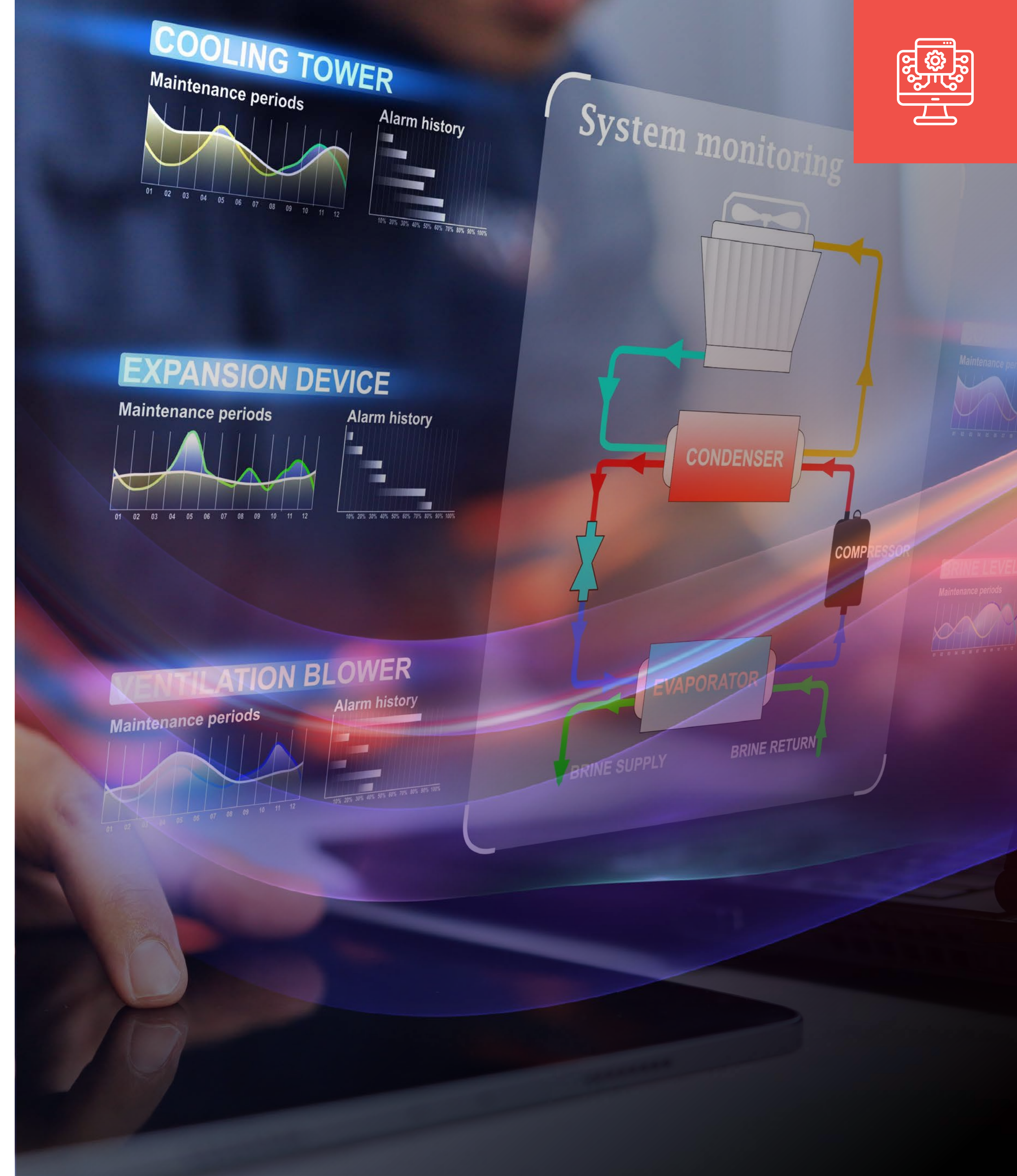


Key advantages include:

OUTCOMES

- ✓ Deployment flexibility across **on-premises, hybrid cloud, private cloud, and air-gapped environments**
- ✓ A **loosely coupled architecture** that avoids forcing all data into a central platform
- ✓ Support for **real-time and batch access** through a single governed layer
- ✓ The ability to **move or persist data only when required**, rather than by default

This approach enables incremental modernisation while supporting mission-critical operations and future analytics and AI initiatives.





ABOUT DENODO

Denodo is a global leader in data management, powering trustworthy AI agents and applications. The Denodo Platform, an award-winning logical data management solution, transforms enterprise data into reliable insights for AI, analytics, and self-service initiatives.

Organizations worldwide use Denodo to deliver AI-ready, business-ready data in a fraction of the time compared to traditional data lakehouses, achieving up to 4x faster time-to-insight, 345% ROI, and 10x better performance.

Learn more at denodo.com

CONTACT US



REFERENCES

1. [Australian Government, Department of Climate Change, Energy, the Environment and Water \(DC-CEEW\)](#)
2. Australian Energy Market Operator (AEMO) – [Integrated System Plan and market publications](#).
3. Australian Energy Regulator (AER) – [State of the Energy Market](#).
4. Bureau of Meteorology (Australia) – [Extreme Weather and Climate Risk Reports](#).
5. CFOtech - [Australian energy firms face data challenges despite digital tools](#).
6. Denodo – [Logical Data Management for The Energy and Utilities Industry](#) (Solution Brief).
7. Australian Cyber Security Centre – [Secure connectivity principles for Operational Technology \(OT\)](#).
8. Australian Government – [Security of Critical Infrastructure Act](#).
9. AEMO – [National Electricity Market \(NEM\) Operations and Market Guides](#).
10. CSIRO – [Electricity Network Transformation Roadmap](#).
11. Denodo – [The Denodo Platform for Data Products](#).
12. ACCC – [National Electricity Market Inquiry Reports](#).
13. Denodo – [VTI Customer Case Study](#).
14. Denodo - [A Top 25 Fortune Global 500 Energy Producer Unifies Data to Lead the Charge in Oil E&P and New Energy](#).