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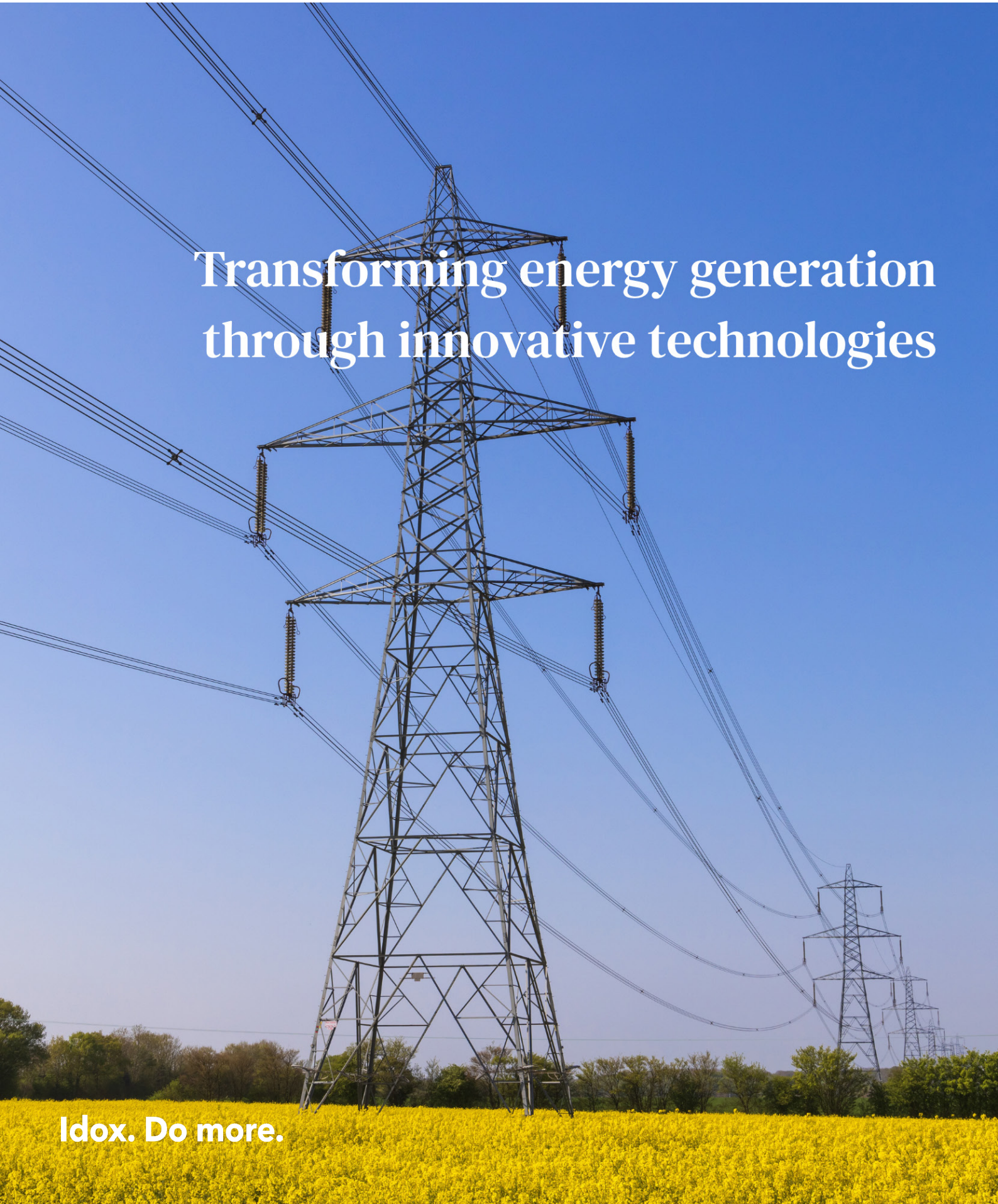

Transforming energy generation through innovative technologies

Idox. Do more.

As electricity demands surge and infrastructures face mounting pressure, electric cooperatives are uniquely positioned to lead the next wave of energy innovation. Explore how digitized information and an Electronic Document Management System (EDMS) with a best-practice utilities template can help cooperatives boost efficiency, enhance collaboration, and meet evolving regulatory and operational challenges. Discover how embracing innovative technologies can transform energy generation and secure a resilient, future-ready power grid.

Section 1: Introduction to the fast changing electric landscape

The power landscape across the US is changing fast. Demand for electricity is surging, fueled by electrification, rapid data center growth and a resurgence in domestic manufacturing.
This fast-rising demand comes at a time when ageing infrastructure is also under increasing threat of damage from extreme weather events.

The implications of these rising demands cannot be ignored. Blackouts are becoming common place, with unreliable power supplies impacting lives and affecting communities' future.
The cost of extreme weather events is rising: with NERC estimating that 27 weather-related events occurred in the United States and three in Canada during 2024, contributed to losses exceeding $1 billion within the bulk power system (BPS) footprint.

In addition to supporting the increasing demand created by existing customers, cooperatives must also respond to new commercial opportunities. Data centers can bring prosperity and boost the local economy and one of the fundamental demands is a high quality, reliable power supply. These energy-intensive facilities currently consume 6% to 8% of total annual electricity generation, and according to Deloitte analysis, this is expected to rise to 11% to 15% by 2030. If cooperatives are unable to provide guarantees of power availability and resilience, significant local investment will be lost to rival states.

Managing increasing pressure

The escalating pressure on the power grid is coming at a time when utilities are being encouraged to move towards cleaner energy, while also reinforcing infrastructure security to mitigate the risk of escalating cyber threat and meet Critical Infrastructure Security and Resilience requirements. For cooperative management teams who have enjoyed decades of steady, manageable demand for power across a stable grid network, these multiple and potentially conflicting changes represent an unprecedented challenge.

Deloitte predicts the key steps required by the industry to respond. In addition to enhancing existing grid efficiency, utilities are also exploring innovations in areas such as reliable and clean power sources. Partnerships and collaboration will also grow, with cooperatives looking to build resilience and share financial risk through a different approach to distributed energy resources and greater collaboration.

Readiness for change

How ready is the industry to change the asset portfolio to meet these new demands? While funding is available to support essential change, including the recently unfrozen funds for the Rural Energy For America Program (REAP), Empowering Rural America (New ERA) and Powering Affordable Clean Energy (PACE) programs, grant applications are complex and require alignment with a changing energy mandate.

Endemic workforce shortage is also adding further jeopardy to the market. The industry is experiencing significant growth in employment, in part to alleviate the problems created by an ageing workforce. However, a skills gaps is emerging: over half of the current utility workforce has less than 10 years of experience.

Cooperatives need to consider how to adapt workforce strategies to address skills gaps and ensure energy innovation is not compromised by a lack of knowledge or technical expertise.

> **"Weather related events contributed to over $1 billion loss within the bulk power system in 2024."**
>
> **North American Electric Reliability Corporation**
> 2025 State of Reliability
> Assessment Overview of 2024

Section 2: Implications for the as-built information gap

These diverse changes are affecting every part of the industry and, in the process, shining a spotlight on cooperative's current information resources. Engineers require fast access to the 'as built' foundations, including drawings, documents and accurate engineering data. Engineering, Procurement and Construction (EPC) contract partners need trusted, accurate and detailed asset information to deliver brownfield change projects. Workers, especially newcomers, need fast access to easily understood information, from asset status to process guides and health and safety requirements to improve their productivity and efficiency.

Yet many of these information resources have been unchanged for years, even decades, as organizations enjoyed the stability of steady state demand and a stable workforce. With data relating to 100,000s of assets recorded across multiple systems in distinct siloed locations, often lacking the metadata required to enable fast, efficient searching, inadequate information is fundamentally compromising not only current agility but blocking vital innovation.

- How quickly can asset 'as built' status and location information be shared with engineering and supply chain partners to gain accurate cost and timing information about a project and enable efficient collaboration?
- Is the cooperative at risk of missing vital funding opportunities, including the $6 billion announced by New ERA and PACE programs, due to the lack of integrated, accurate asset information?
- How confident is the management team in the cooperative's ability to meet escalating compliance demands, including NERC Critical Infrastructure Protection (CIP) without compromising essential innovation and expansion?
- What plans are in place to manage the transition to a younger workforce and new energy generation solutions?
- After years of limited investment in information resources, cooperatives have now reached the tipping point: how will the organization respond to these diverse challenges without a single source of trusted digital information?

Section 3: EDMS with best practice electric utilities template

Cooperatives require a centralized platform for sharing and managing documents and associated processes within asset construction, enhancement and maintenance. However, evolving from the current state of disorganized documentation spread across multiple silos to a fully digitized, searchable resource that can be securely shared throughout the supply chain can appear daunting.

Each cooperative typically has a wide array of document types that describe the operation and maintenance of 100,000s of assets, many with revisions going back decades. Each piece of information is interlinked, from asset location to drawing to supplier technical specifications to back up procedures and safety processes.

The evolution from 'as-is' to 'to-be' state can now be achieved within a much shorter time than many perceive. Leveraging extensive experience in working with cooperatives across the US over the past two decades, Idox has evolved the best practice electric utilities template to fast track the creation of a single source of digital information. The EDMS with a proven out of the box electric utilities template can adapt easily to generation and transmission changes. Furthermore, with automation and the possibilities enabled by AI, the solution delivers continuous improvements in cost and efficiency. The best practice template accelerates the process by building in depth understanding of engineering processes combined with robust workflows that enforce document creation, approval, publishing and transmittals models.

"The time saving is huge. We can generate drawings and process them a lot quicker compared to standing by a printer and duplicating them manually. Our review process is also swifter, projects stay on schedule and submittals can be handled electronically."

Clint Wald,
Senior Engineering Document Specialist
Basin Electric Power Cooperative

- Workflow: Documents are both tracked for usage, including both viewing and revision, and status within a workflow. Whenever a stage within a process occurs, whether that is design, construction or operational change, relevant stakeholders are notified. The system also records the progress to provide a fast view of the status of each workflow.

- Security: Each document includes a watermark, an unalterable stamp that shows its purpose, when it was reviewed, approved and signed off, by whom, and on-going revision status. This watermark provides the full history of every individual - from cooperative and partners - involved in the creation and use of the document. This in-depth document history provides essential information and evidence in the event of questions or disputes.

- Audit Trail: Every document stored includes a full history including its issue purpose, for example design or construction, the custodian, reviewers, approval steps. The system also records every time a document is viewed and by whom. With this golden thread of information, including every document view, every change, both internal and by contractors, a cooperative has a complete audit trail.

- Compliance: Traceability and auditability streamline regulatory compliance, for both internal and external standards.

- Enhanced visualization: A single document viewer ensures users can access, read and mark-up all document types, from drawings, models, office documents and image files, on any device both in the office and the field.

- Resilience: To ensure 24x7 access to this business-critical data demands robust storage, backup and disaster recovery. While many cooperatives will leverage existing resilience strategies with onsite data storage models, if using off site providers it is important to look for a provider that stores primary data in an ISO 27001 data center, with a daily back up to a secondary disaster recovery facility ensuring continuous and seamless access to information.

Streamlined migration and adoption

The Idox EDMS solution includes support both in document migration and user education to accelerate adoption, increasingly using the power of AI to accelerate change.

Data migration
The Idox migration process includes locating and collating information across different locations, ages and format types into a single consistent source that supports both innovation, collaboration and regulatory compliance.

The entire data migration process can be accelerated by using AI to automatically capture vital metadata. Within this highly regulated environment, around 30 pieces of metadata are required for each document, including title, author, document type, revision, review and approval data. By extracting metadata and prepopulating the EDMS with the required information, AI is transforming the speed of document migration and significantly reducing deployment timescales.

Within months, organizations can evolve from outdated, disparate document resources, often without the required metadata, to a comprehensive single data source that is fully digitized and searchable, with documents and summaries discoverable in seconds.

Adoption
In addition to user training and education, AI is easing the transition to the new system. Workers can use natural language to query the User Guide, for example, and quickly access a relevant summary – in multiple languages. This facility plays a key role in improving user engagement throughout the onboarding process. AI can also create mini training courses in a relaxed style to appeal to the younger workforce, even including exam questions to demonstrate levels of understanding.

In addition to improving the adoption of the new solution, AI will also help organizations manage the onboarding of new workers who have less understanding of the environment than their older, more experienced colleagues.

Section 4: Leveraging digitized information to achieve operational excellence

A single source of digitized information transforms operations. It delivers essential agility at a business level to make changes, increases efficiency across business processes and provides unprecedented speed of access to trusted information. Risk is reduced both through enhanced compliance and ensuring EPCs have easy access to accurate information to help drive change projects.

Transform efficiency
Delivering the right information to the right people at the right time improves day-to-day responsiveness and engineer productivity, reducing overall costs. Risk and rework are reduced, leading to a further lowering of costs through reducing emergency repairs, change orders and fines.

AI enabled natural language search is also driving additional efficiency gains, with workers able to query one or more documents without requiring complex or industry specific terminology. For individuals new to the business, unfamiliar with certain processes, procedures or guidelines, the ability to quickly access information in both summary and detail is incredibly valuable, enabling new workers to quickly become as productive as experienced colleagues.

Support collaboration
Change and, critically, essential innovation must be achieved within a complex supply chain of interlinked cooperative businesses and third parties. A smooth, trusted flow of information to the smaller cooperatives and EPCs involved in delivering change is vital to efficient operation. Using technology to optimize workflows throughout the supply chain, improving performance and doing so in a way the retains, even reinforces, compliance can transform the collaborative process.

Furthermore, at a time of significant investment and innovation, EPCs also have a finite resource. To attract the best business partners, cooperatives need to be easy and efficient to work with.

Empower a changing workforce
Improving information accessibility enables organizations to segue towards a new skill set and workforce at a time of mass retirement. The new generation does not have the same level of experience and understanding, by default; but also expects digital tools, mobile access and information that is easy to grasp. Combining a single source of digital information with AI and natural language search will enhance productivity and confidence throughout a changing workforce.

Minimize risk
Providing engineers with immediate access to the correct information, at the right time, minimizes the risk of mistakes linked to misunderstanding of asset state. With complete confidence in the veracity of information, risk to infrastructure performance, corporate liability and, critically, workforce safety are reduced. Rapid access through natural language search to information such as procedures and health and safety requirements on site, further reinforce workforce understanding and good behaviors.

Streamline compliance and audit
As cooperatives balance vital innovation against escalating compliance demands, trusted information shared across the businesses ensures plans for new power generation remain within the boundaries of NERC and Critical Infrastructure Security and Resilience compliance. The traceability and audit trail also simplify self-assessment and internal audits for NERC and FERC standards compliance.

Strategic improvement
Management teams gain immediate access to accurate, trusted information supporting improved and faster decision making. A key benefit will be the support for inward investment. In addition to providing the high-quality information required to identify opportunities, a single source of trusted information underpins the funding requests required to attract vital additional resources.

Efficient operations combined with innovative investment in new generation facilities will also improve the cooperative's commercial position. The ability to provide power resilience pledges to new businesses, including data centers, should help to attract inward investment and add significant economic value to the local community.

Basin Electric Power Cooperative

Generating and transmitting wholesale bulk electric power to a network of rural electric cooperatives across nine American states, Basic Electric Power Cooperative serves three million consumers. With a diverse energy portfolio spanning coal, gas, and renewable energy, including wind power, the cooperative needed to evolve its document management process.

The Idox solution effectively supported the transfer of more than one million documents, of which approximately 500,000 are active and in use. With a comprehensive document management system, Basin Electric can remain confident that they are all working from the most up-to-date version of a file, delivering safety and savings from improved accuracy, easier collaboration and reduced errors. Each facility has also been able to retain workflows, ensuring document integrity with minimal disruption.

Section 5: Conclusion

For many cooperatives, power demands have remained static for decades. A steady infrastructure has demanded limited change which has been easy to manage. That status quo is now facing very significant disruption. From the new generation demands to transmission challenges, escalating compliance to the changing workforce, every aspect of the business is facing momentous change. This change cannot be safely achieved without fast access to accurate, trusted information.

Cooperatives need to grow and deliver new levels of resilience and that can only be achieved if solid 'as built' foundations are in place. A trusted single system of record improves the efficiency of engineers. It streamlines collaboration with vendors and contractors. It enhances collaboration. And transforms worker understanding and therefore productivity. It is the foundation for the effective energy generation of the future.

For further information on EDMS and how it could help your business, please email marketing@idoxgroup.com

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