Business Strategy

Business Strategy: CLK Enerji Sets an Ambitious Tone for Business Transformation in the Turkish Energy Industry

Jean-François Segalotto   Roberta Bigliani

IDC ENERGY INSIGHTS OPINION

CLK Enerji is Turkey's largest electricity utility group. It comprises four distribution companies and four retailers collectively distributing and selling nearly 46TWh of electricity per year to nearly 10 million customers, representing around one-third of the market.

This IDC Energy Insights study focuses on the extensive transformation program CLK has initiated in 2012, right after the group formed in the wake of the sector's liberalization. The program aims at modernizing CLK's processes, network, and technology, bridging the investment gap created during the 15-year privatization and making the company fit to compete in the newly liberalized market.

- The scope of the program extends to virtually the whole IT and OT stacks. Over the past two years, CLK has implemented almost every technical system the typical modern electric utility has in place (mostly in greenfield deployments) including:

  - Distribution network control and management systems; asset management, work scheduling, and field force mobility systems; geographic information systems and network models; as well as field automation equipment.

  - Systems supporting customer operations in the competitive market including billing, customer relationship management and customer interaction channels, and metering, in addition to billing and meter data management for distribution.

  - Corporate systems supporting full enterprise resource planning, trading, and risk management, along with data warehousing, business intelligence, and reporting.

- This adds to the extensive IT-OT integration work across these systems for improved operational awareness and resource optimization, and to enable advanced capabilities.

- Bringing international expertise in both the IT and OT domains of the program, Wipro was selected to support CLK Enerji in orchestrating the end-to-end transformation effort.

- Rather than executing projects one by one, CLK is carrying out the transformation as a single, comprehensive program, involving a single integrated IT-OT design across all operating companies and service regions. This unifies processes and the technical architecture across the organization and maximizes CLK's advantage as a first mover.

- The complexity and scale of the program required strong design, collaboration, and project governance principles to be implemented. In particular, principles such as user-centricity, best-fit, and minimal customization of products underpinned the whole technical program, from the design, through selection, to implementation.

- The transformation program is bound to have a significant impact across the CLK Enerji's organization and beyond. With close to 80% of the technical deployment completed, measurable benefits are already being felt in the distribution area and corporate functions.

IN THIS STUDY

This IDC Energy Insights study looks at the extensive transformation program currently ongoing at Turkey's largest electric utility CLK Enerji. In the wake of market liberalization, the program aims at entirely modernizing the processes and technology landscape of the company's distribution and retail businesses, as well as across its corporate functions.

The study analyzes the program's market determinants and business needs, as well as the objectives across CLK Enerji's functions. It describes the end-to-end technical solution and its deployment, from the overall architecture design and the selection criteria for the individual components and systems integrator, to the principles governing the actual implementation effort. Finally, it provides a view of the long-term business value expected from the transformation, including some of the measurable benefits already delivered, along with some of the major lessons learned so far in the program.

IDC Energy Insights' Case Studies Series

IDC Energy Insights' case studies series provides utilities with fact-based, comparable, consistent, and independent views on interesting projects implemented across geographies. The focus is on new business models, digital transformation initiatives, IT and operational technology (OT) solutions implementations, and, more broadly, energy technology initiatives that contribute to innovation and sustainability. Collaborating with utility companies and vendor personnel directly involved in the projects, IDC Energy Insights analysts gather all relevant information and analyze the approaches taken and the solutions' success in meeting their stated goals. Case studies are assessed against the four criteria that IDC Energy Insights believes are critical to generating additional value: contribution to operational effectiveness, degree of technological innovation, transformational impact on the company's businesses, and, more broadly, the utilities industry value chain.

Why This Case Study?

This case study was selected because of the ambitious scale, vision, and approach adopted by CLK Enerji to transforming its business and technology amid the sweeping change hitting the energy landscape in Turkey.

CLK's is likely the largest utility modernization program in Turkey and one of the largest in the region, extending to virtually all major business processes and the whole IT and OT stacks, including the grid infrastructure itself. This transformational leap was critical in order to fill the significant investment gap created during the long privatization process.

Beyond the raw scale of the transformation and extensive integration work across IT and business systems, CLK Enerji made a number of crucial strategic decisions.

On one hand, it opted to unify processes, IT, and technical architecture across all the group's operating companies. This is something many utilities operating are still hoping to do. On the other hand, CLK Enerji took the ambitious decision to carry out the transformation as a single comprehensive program rather than on a project-by-project basis targeting single business lines or systems.

With very few legacy systems in place at the start of the program, CLK Enerji's was, in many respects, a greenfield transformation. This was an opportunity for the company to both select solutions for today's needs and provide a strong IT foundation to develop future capabilities.

SITUATION OVERVIEW

Turkish Market Liberalization

Over the past 15 years, the Turkish energy landscape has been profoundly reshaped by the industry's liberalization. Driving the transition has been the electricity sector, where privatization was an ambitious project whose origin dates back to the mid-1980s.

By the turn of the 21st century, Turkey's growing appetite for energy, coupled with the electric system's inefficiencies and aging infrastructure, called for significant investment in the modernization of both the grid and utility processes. The breakup and privatization of nationwide monopolies and the transition to an unbundled, competitive market appeared as the most obvious path for the policymaker toward stimulating such investment.

Between 1994 and 2001, the building blocks for such transition were laid by splitting the former nationwide public monopoly TEK into four separate entities for power generation (EÜAŞ), transmission (TEİAŞ), wholesale (TETAŞ), and distribution (TEDAŞ). The ultimate goal was the privatization of all public entities across the value chain other than transmission.

In 2005, in preparation for the privatization process, TEDAŞ' distribution network was split into 21 regions, each operated by a separate subsidiary. In 2008, the first tenders for privatization were launched, and by mid-2013, control over all regional distributors had been transferred to private entities, generating approximately $12.9 billion in revenue. Each private DSO was granted a 30-year monopoly distribution license, in addition to a retail sales license subject to unbundling.

At the end of 2012, mandatory legal unbundling entered into force, and also by mid-2013, distribution and retail functions started to operate independently. Starting in the same year, eligible consumers (i.e., customers whose yearly consumption is above a regulated threshold, targeted to be zero as of end-2015) have been free to choose their suppliers.

Company Overview

CLK Enerji was the largest electric utility group to emerge from the industry's transition. It distributes and sells nearly 46TWh of electricity per year to 9.6 million customers across 11 provinces, representing around one-third of the market (Figure 1).

Established as the electric utility consortium of three of the country's largest industrial conglomerates (Cengiz Holding, Limak Holding, and Kolin Construction), the group formed from the acquisition of four formerly state-owned regional distributors between 2010 and 2013, including:

- **AEDAŞ**: distributing about 7.9TWh annually to around 1.7 million customers in the Mediterranean region across the Antalya, Burdur, and Isparta provinces.
- **BEDAŞ**: Turkey's largest electricity distributor, delivering about 24.2TWh per year to 4.3 million end users on the European shore of Turkey's largest city Istanbul.
- **ÇEDAŞ**: serving about 860,000 customers and 2.7TWh per year in Turkey's Sivas, Tokat, and Yozgat provinces, in the eastern part of Central Anatolia.
- **UEDAŞ**: distributing 10.8TWh of electricity annually to 2.7 million users across the Balıkesir, Bursa, Çanakkale, and Yalova provinces in the Marmara region in the country's west.

In 2013, following the entry into force of legal unbundling, distribution and retail activities were split across each of the four utility companies. Four separate retail entities were established within the group which started to operate in July 2013, selling electricity in each of the four service regions.

Today, CLK Enerji's perimeter comprises nine entities, including eight operating companies (four distributors and four retailers) and the group holding and energy trading company.

FIGURE 1

CLK Enerji Group Footprint
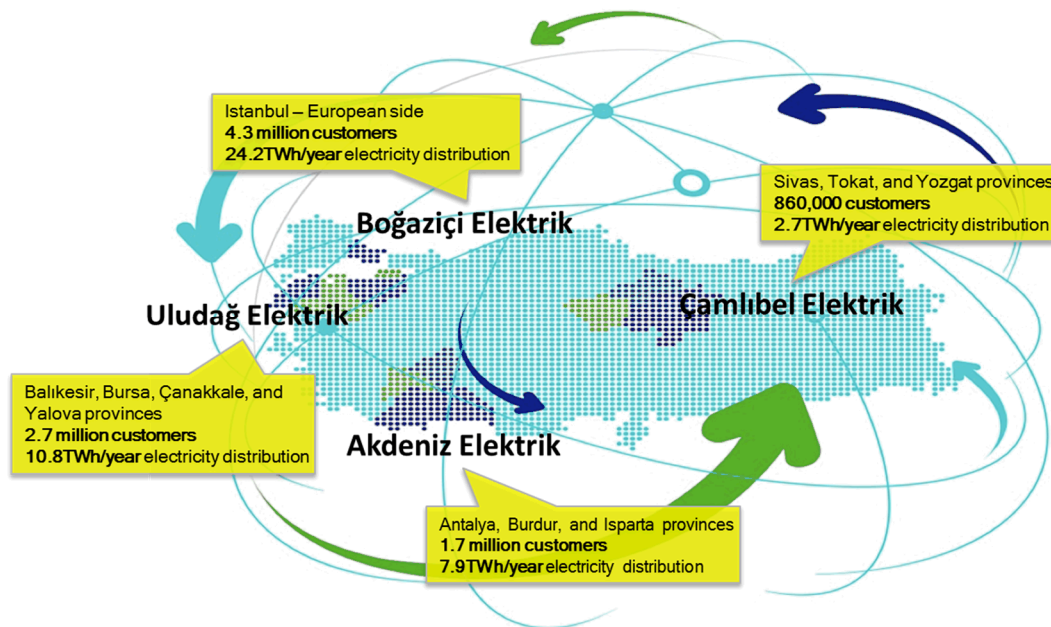
Source: CLK Enerji, 2016

Business Needs

The long privatization process meant the much-needed investment in the country's electricity distribution system had been severely delayed. As most newly privatized utilities, CLK Enerji had to cope with old grid infrastructures, large organizations, obsolete processes, and inefficient operations. In addition, market liberalization required public monopoly suppliers to turn into agile competitive retailers over a relatively short period of time, with legal unbundling adding further complexity to the process.

> "With this program, CLK Enerji is leading the transformation of the Turkish electricity market."
>
> **Serhan Özhan**
> CIO, CLK Enerji

The transformation program was devised at CLK Enerji with the ambitious overarching goal of modernizing the grid and its operation, as well as making the company fit to compete in the new context of a liberalized and unbundled energy market. This meant:

- Carrying out a comprehensive business process transformation in order to give CLK the necessary operational tools to be efficient and competitive in what is expected to become a hotly competitive market in the near future.
- Performing a complete modernization of the systems across the company's IT landscape and infusing automation into its primarily manual grid operations.

- Managing a leap ahead from the current situation, requiring significant change management efforts.

THE APPROACH

Project Background and Objectives

CLK Enerji has displayed an ambitious vision since the outset of the project: to transform into a modern utility that can efficiently and proactively manage the grid and its customers by employing integrated state-of-the-art IT and operational technologies (OT).

The company's high-level objective was to implement a single integrated IT-OT solution design across all the group's companies. The system should support grid automation and energy trading, provide better regulatory reporting, financial accounting, and field force management, as well as support customer centricity across retail operations.

Target areas of transformation were identified across all major functional areas:

- **Distribution:** reduce (technical and non-technical) distribution losses and outage minutes, and improve the quality of supply beyond regulator-mandated levels. Improve the efficiency of investment in the grid and its maintenance, automate grid control processes, and manage the field force more effectively. Finally, support the management of advanced metering infrastructure on large-scale commercial and industrial (C&I) accounts.
- **Retail operations:** improve billing and collection capabilities, reduce unaccounted-for energy, and streamline customer onboarding and offboarding. Provide superior customer experience, moving toward greater customer centricity and digital touchpoints. Be able to market new tariffs to existing customers and attract new ones through innovative offers.
- **Corporate functions:** achieve more effective trading, better regulatory reporting, more efficient procurement and warehouse management, and better tracking of personnel and associated payroll and HR needs. All this by creating visible and measurable corporate processes across the group's companies and leveraging a single back-office solution design.

When CLK Enerji took over the four regional distributors, very few technical systems were in place and most business processes were either undefined or undocumented. Achieving these goals thus required a comprehensive overhaul of both across the three functional areas.

In particular, the existing IT landscape consisted of over 30 legacy applications: a mix of basic office automation software, best-of-breed solutions, and locally developed systems that were in many cases outdated and out of support.

- In the work and asset management area, the existing asset information repository was spread across a patchwork of applications and processes. For instance, transformers were managed using a dedicated web-based system, substations were managed using Microsoft Excel, maintenance work orders were managed using paper files, while outage work orders were stored in call center applications. Of the four former public distributors, only BEDAŞ (the largest in terms of the customer and asset base) used a GIS for storing network topology. However, the network data in the model was not current, so the GIS did not reflect the "as-built" network.
- Since most substations were manually operated and network diagrams were primarily on paper, network operations had been split into small, manageable operational units, 27 of which had been created just to cover the Istanbul service area.

- In the retail area, the processes and system used to manage customers and meters needed to be separated between retail and distribution functions. In addition, the legacy billing system had been heavily customized and was on different versions across the four companies, making an upgrade challenging and requiring a complete replacement instead.
- Comprehensive modernization was needed across corporate functions. For example, HR processes such as employee training, onboarding, and offboarding were managed to a large extent using Microsoft Excel, while the legacy finance applications were unable to accurately track inventories.

Finally, the scale and scope of both the IT and business transformation meant a significant change management effort was needed, including for training and reskilling the workforce for a completely new way of working.

Solution Description

As the gap between the objectives and the legacy landscape suggests, the scope of the transformation program extends to virtually the whole IT and OT stacks.

From a technical perspective, CLK Enerji needed to implement almost everything the typical modern distributors and retailers have in place (Figure 2). Where legacy systems existed, state-of-the-art products were selected to replace them, although in most cases the program involved greenfield deployments (e.g., SCADA, GIS, trading system, HR management, and EAM).

In the distribution operations area, the program includes:

- The deployment of a real-time network control and management solution from ABB, including ABB Network Manager's SCADA, DMS, and OMS, as well as Outage Lifecycle Management (OLM) systems for all four distribution regions. This included the implementation of the SCADA HMI, SLDs, and network controls from transmission substations to service transformers. This particular project represented a significant milestone, at the same time being one of the first SCADA implementations in Turkey's electricity distribution market and the first global implementation of ABB's OLM.
- The implementation of an end-to-end asset life-cycle management, work scheduling optimization, and field force mobility solution, leveraging Oracle Enterprise Asset Management (eAM) and ABB Service Suite mobile workforce management (MWFM).
- End-to-end GIS mapping, including asset coding and customer indexing, and GIS-enabled network modeling: creation of the electrical network model for 30 sq km for each of the four service regions covering the entire MV and LV lines, from the transformer substation to end consumers. All leveraging Esri ArcGIS.
- The rollout of field automation equipment, including greenfield commissioning and rollout of 908 remote terminal units, 6,155 relays, and 5,050 energy analyzers, enabling real-time monitoring and control of 1 million input/output points. ABB was the chosen technology provider for the substation automation and RTU field automation components.
- The deployment of a data management system for CLK's advanced metering infrastructure (AMI) for large C&I customers and integration with three different AMI headend systems using Oracle Utilities Meter Data Management (MDM).

The Oracle Utilities Customer Care and Billing (CC&B) suite is being deployed as the billing platform for the four DSOs. On the retail side, the transformation mainly involves replacing the legacy billing system and deploying software supporting customer operations capabilities for the competitive market such as CRM, customer interaction channels, and metering.

The modernization of corporate functions includes:

- The implementation of Oracle E-Business Suite (EBS) ERP modules supporting human resources, finance, logistics, procurement, and projects, among other functions.
- The deployment of a platform and capabilities for energy trading in the deregulated market leveraging an energy trading and risk management (ETRM) solution from local vendor A Plus, including integration into front office and ERP systems for regulatory reporting.
- The implementation of business intelligence (BI) and reporting capabilities leveraging Oracle Utility Analytics, Data Warehouse, and Oracle EBS BI Applications.

As part of the transformation program, over 200 integrations are being carried out within and outside the organization, leveraging Oracle Fusion middleware and service-oriented architecture. This comprises extensive IT-OT integration work including direct interfaces between the SCADA/DMS/OMS system and GIS, work scheduling and filed force mobility, CC&B, MDM, and BI applications. This will support the integrated network model, meter/customer mapping, direct outage work assignment, AMI outage event notification, grid analytics, and more.

This adds to an enterprise performance management portal, single sign-on, and integrated identity and access management across 12 systems leveraging Oracle Identity and Access Management. Finally, a large-scale change management effort, including hundreds of training and people enablement programs, is being carried out as part of the program.

FIGURE 2

Solution Components in the CLK Enerji Transformation Program
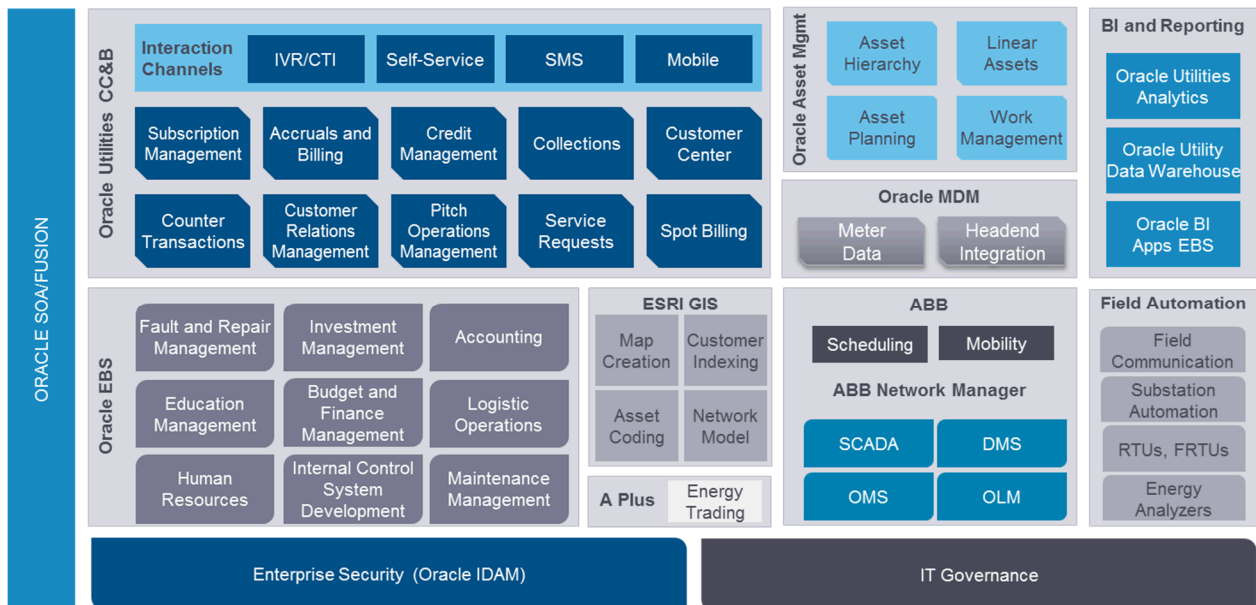
Source: CLK Enerji, 2016

Selecting the Solution

Designing the solution's architecture and selecting the individual products and the systems integrator (SI) to implement them required a complex, two-year process.

CLK Enerji started the analysis phase in early 2012, with a view to entirely redesign target processes (and in many cases design them from scratch). In parallel, it began examining technical solutions supporting such processes and interacting with most major vendors in the industry. By mid-2012, the company was writing the necessary technical specifications and requests for proposals (RFP). After this, a long RFP cycle began which extended well into 2013, with product demonstrations happening early that year.

Central to the selection phase was CLK's decision to steer away from project-by-project execution targeting single functions or business lines. Instead, the company opted to initiate a single, comprehensive transformation program, involving a single integrated design across all operating companies and regions. The program would be executed over the shortest time possible, with the support of a single services provider. This was a very challenging decision for CLK and a watershed moment for the whole program, mainly driven by the rapidly evolving structure of the market and the need to preempt competition. This resulted in all technical RFPs being merged into a single, all-encompassing IT RFP and all the OT elements being included in the program.

In 2013, CLK started discussing the transformation program with services providers and shortlisted seven international candidates. High-level requirements included:

- A global footprint and domain knowledge to support the program's objective. Given the closed nature of the Turkish utility industry and its mainly public background, CLK aimed at filling the skill and technology gaps by infusing global industry knowledge into the project.
- The critical mass and capabilities to implement the integrated solution end-to-end: proven ability to deploy the infrastructure and implement an integrated IT and OT environment over a short period of time, while managing all the solution vendors involved.

Formal service provider selection happened in early 2014, after which a five-year contract was signed with Wipro covering the technical implementation of the major solution components (during the first two to three years), followed by maintenance and further systems optimization. Among the main elements considered in the selection was Wipro's ability to collaborate with the customer on its large-scale company transformation. This combined with Wipro's expertise in both the IT and OT domains. Other factors included Wipro's commitment to the industry and geography, as well as its ability to mobilize key resources from across the world into the local organization.

Wipro was selected for its ability to collaborate with CLK on its large-scale company transformation, and for its expertise in both the IT and OT domains.

Regarding the individual products in the scope, CLK Enerji's general selection criteria included user-centricity and best-fit based on the overall architecture, in addition to a number of key design principles. This approach underpinned the whole transformation program, from the overall architecture design to specific integration choices (see Implementing the Solution section below).

For instance, one of CLK's strongest business requirements was to reduce the number of outages and their duration as well as minimize the number of customers affected. In addition, with 80%-90% of work orders being outage-related (versus less than 10% planned maintenance), outage management was by far the most important business process from an asset maintenance perspective. This prompted CLK to select ABB Network Manager and OLM as the focal point of the solution for distribution operations.

Once these systems had been chosen, CLK went on to select the scheduling system and field force mobility solution that offered the tightest integration possible (ABB Service Suite). To minimize restoration times, CLK and Wipro leveraged the productized integration between ABB's Network Manager OMS and Service Suite MWFM, so that outage events are managed between

the OMS and the scheduling and mobility application, bypassing the EAM system. Only once an outage is resolved that a record is created in the EAM for historical analysis, planning, reporting, and other purposes.

On the commodity trading side, the specificities and maturity stage of the Turkish market meant selecting and adapting an international ETRM solution would represent a significant challenge. Instead, a local supplier was identified as the best fit for the program. In addition to offering a product built to the local regulatory requirements, the vendor offered longstanding experience and a deep understanding of the Turkish market, as well as knowledge of the regulatory process.

Oracle CC&B was the solution selected for CLK's front office in both the retail and distribution areas, and almost all functionalities in the suite are being implemented. Key to the product's selection was its industry-specific set of standard functionalities, the workflow-based design, and user friendliness. The Spot Billing application was instrumental to fulfilling the specific requirement for onsite billing, a service CLK wants to continue offering in the future. To do so, it was important to mitigate the effects on the service performance (i.e., the ability to print a bill onsite within an acceptable timeframe) of the onsite billing application having to interface with three separate metering and billing systems across retail and distribution (versus one, previously). To accomplish this, all the necessary billing calculations are run in the middleware, and reconciliations are done at the end of the day.

In the asset mapping area, Esri ArcGIS was selected. Early in the program, a critical design choice was made for integrated GIS mapping, so the entire network model and asset hierarchy would be developed using Esri and maintained in the GIS. As a result, the system now works as the master data repository for network assets and their status, providing a "single version of the truth" across operations, maintenance, and planning.

Implementing the Solution

Technical implementation started in September 2014 and will terminate at the end of 2016. In order to manage such a vast project, strong collaboration, project governance, and design principles were designed and implemented.

A single team was created across CLK Enerji and partner organizations, with Wipro mobilizing key resources from across geographies into a core team that was co-located with CLK. Collaboration was built on the clear articulation of the program's scope, people roles and accountability, as well as regular communication of the program's plan, milestones, dependencies, and reporting. Visible governance processes were drawn across the program and communicated to the team including for scope change management and issue resolution. From a project management perspective, the plan and associated risks and issues were tracked on a weekly basis.

> **CLK Enerji and Wipro created an integrated team, with Wipro mobilizing key resources from across geographies.**

As mentioned, the solution design approach was built on a number of principles, including:

- **Single integrated design.** With a single technical implementation, CLK is unifying the processes and enterprise architecture across its eight operating companies.
- **User centricity.** CLK's own users and final customers were put at the center of the process and solution definition for corporate functions, field force, retail, and self-service applications.
- **Best-fit product.** Alignment with the overall architecture and best fit for CLK's business requirements were the main criteria driving the selection and integration of individual products, as opposed to a single-vendor end-to-end approach.

- **Design principles.** Wherever possible, products are deployed in their out-of-the-box (OOTB) version with minimal customization and integrated using standard components. This delivers benefits in terms of easier and cheaper upgrades, better vendor support, and preservation of industry standards and best practice as embedded in the OOTB functionality.

The program entails a huge implementation effort: hundreds of processes were designed, more than 500 design workshops completed, and more than 1,000 among process and functional design documents were produced. By June 2016, hundreds of technical components had been implemented, along with over 200 integration items, over 300 individual development objects, and 1,000 test cases. Around 130 offshore and 140 onshore developers worked across the several subprojects, along with some 300 people among field engineers and GIS staff. Overall, more than 2,000 users are involved, 500 of them as key users.

Adding to the complexity, legal unbundling obligations force each group company to have its own IT environment. So, despite the single integrated design, eight separate application landscapes are being implemented, each hosted in a separate datacenter without any physical integration.

By June 2016, close to 80% of the technical deployment phase has been completed across the eight operating companies, with the following milestones:

- Implementation of HRMS and the first phase of the remaining ERP modules, including all corporate management systems
- Implementation of the GIS, with pilot regions now live for each company
- Implementation of the non-network portion of the EAM system along with the work scheduling and field mobility solution
- Outage work order dispatching and mobility live in pilot region in BEDAŞ
- SCADA pilot running in each of the four service regions
- SCADA DMS/OMS production installation under way
- Deployment of ERP phase 2, ETRM, CC&B, MDM, and EAM ongoing

Business Value

With its scale and reach, the transformation program is bound to have positive measurable impact across the CLK Enerji's organization and beyond.

Headline benefits include synergies, better collaboration, and reduced cost of operations from using a single design solution and uniform processes across the four service regions and eight operating companies. Process automation is already drastically improving productivity, particularly across corporate and retail functions such as HR, procurement, finance, and billing:

- Month-end closure has been shortened by 15 days, from the 25th of the following month to the 10th, and overall, the time required to develop all financial reporting has been cut from days to less than an hour. The payroll run has been reduced from five days to a couple of hours.
- Integration of logistics, procurement, and warehouse and outage management has significantly shortened the procurement cycle and quickly reduced inventory levels from about one year to two months.
- In the energy trading area, the common ETRM platform used across the four regions will provide better accuracy in forecasting and better tracking of contracts.

Once live, the CC&B system will improve billing accuracy and speed up collection from weeks to days, benefiting CLK's cash flow. CRM capabilities will help reduce complaints and improve customer support, raising customer satisfaction and helping reduce churn.

Extensive modernization in the distribution area and IT-OT integration (Figure 3) is expected to pay off in terms of greatly improved operational awareness and resource optimization.

- The new SCADA/DMS/OMS system will provide CLK for the first time with a centralized platform to remotely operate the grid. Each region has now one control room and a backup control room enabling 24 x 7 grid operation and proactive outage management.

- The integration between the OMS, GIS, and the integrated work and asset management solution is expected to improve average outage restoration time by over 50%, enabling CLK to trade outage response work for planned maintenance. Reductions in outage minutes are already being reported in pilot regions. It will also enable better regulatory reporting, improved resource utilization, more accurate asset and work accounting, better work order routing and fewer truck rolls, tracking of connected linear assets, and location-based applications.

- In addition, GIS mapping, asset coding, and customer indexing work will provide a "single version of the truth" to all related functions and systems.

- Over time, the integration between DMS and enterprise systems will improve the quality of supply, help identify loss causes, and allow for better planning.

- The integration between DMS/OMS and ETRM will result in better forecasting and improved trading operations.

- Better utilization and monitoring of assets (via integrated SCADA, GIS, and asset management systems) will reduce asset failure and improve reliability, while also improving CLK's health and safety record.

FIGURE 3

IT-OT Integration Scope in the CLK Enerji Transformation Program
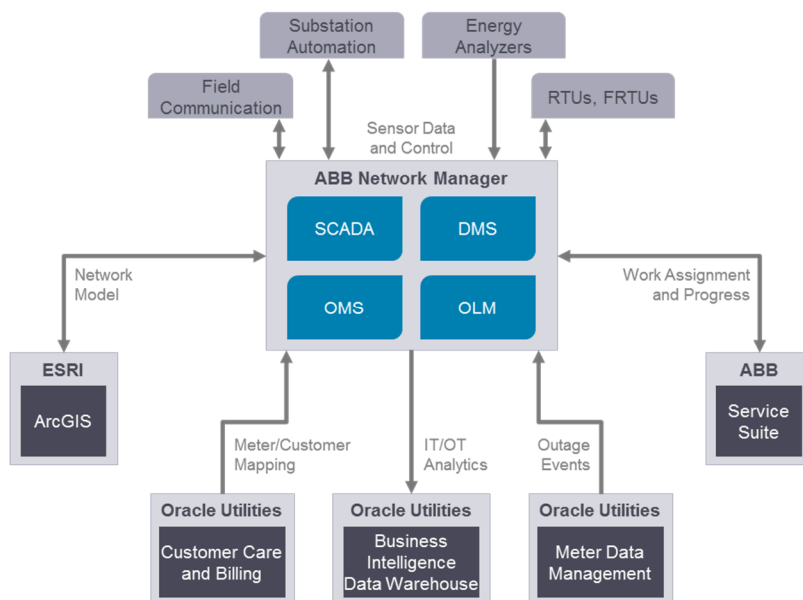
Source: CLK Enerji, 2016

Lessons Learned

With so many undefined processes and very few operational or IT systems in place prior to the program, CLK Enerji's was, in many respects, a greenfield transformation. While this enabled the company to design and implement a best-practice integrated architecture, the inherent complexity and scale posed numerous challenges, from planning mistakes and system and infrastructure issues to regulatory challenges and partner management. The following are some of the major lessons learned so far into the program:

- **Change management** is by far the biggest challenge of all, not only because of the scope of the program but also because of the relatively quick technical implementation phase and the ongoing market liberalization process. The program aims at providing a single solution to eight companies across four very different service regions: this means eight different sets of requirement, operating environments, and management, in addition to a workforce largely coming from the public service era. Several workshops were carried out across the organization to illustrate and convince all stakeholders and users of the prospective benefits of the single solution. The necessary organizational alignment, process visibility and efficiency, as well as mindset change were promoted by designing primary processes around KPIs and creating companywide benchmarking mechanisms.

- Due to the greenfield nature of the program, and because CLK opted to execute it in one go, **project management** was also very complex. Running several large projects in parallel, most of which linked to one another, was challenging from a program management perspective. For example, the GIS technical implementation ran in parallel with the actual GIS mapping process and network modelling across the four distribution regions. This involved coordinating thousands of people in the field for site surveys and collection of grid connectivity data that were the input to the actual implementation process. Once the final architecture design had been established, the most efficient sequence was established for the individual implementation projects. However, in many instances, the timeline proved too tight.

- IT-OT integration proved to be the most challenging activity from a **program governance** perspective. On one hand, steering the extensive technical integration work was inherently complex. On the other, bringing together operations and IT staff with a distant mindset and technical background proved very hard. Strong governance methodology was key to the success of both individual projects and the overall program, including a clear articulation of the plan, roles and accountability, visible processes, and close tracking of projects.

FUTURE OUTLOOK

Next Steps

Although the technical implementation phase is almost concluded, the program will continue until 2019, and in that period CLK and Wipro will work on maintaining and further optimizing the systems. Most importantly, in the first year after the end of the implementation, CLK will focus on managing change, stabilizing into the new business and IT environment, and realizing the benefits from the transformation. Only in the second year that the company will start thinking about additional changes and new implementations that could be brought in.

> **"This program will provide a strong IT foundation to develop future capabilities and respond to evolving regulatory and customer needs."**
>
> **Serhan Özhan**
> CIO, CLK Enerji

Among CLK's most immediate plans is to leverage the data integration and analytical capabilities enabled by the new MDM system. Currently, CLK's AMI covers only about 5% of its metering points (no mass rollout has been mandated in the country), but these account for around 50% of consumption, as most large-scale accounts are managed via AMI. While it has so far only used smart meters for billing purposes, CLK is now integrating the AMI and the ETRM platform via the MDM system. Once it goes live, the company plans to use the MDM's advanced consumption analytics to make its trading and risk management operations more effective and proactive, which is crucial at a time of increasing competition in both generation and supply. CLK will also use the MDM's technical loss analysis capabilities to reduce significant theft and loss ratios across its network. This is a major KPI for the distribution business and one of the main reasons behind the integrated design of the SCADA/DMS, AMI, CC&B, and ETRM systems architecture.

Another area where CLK is expected to play is advanced distribution analytics. Currently, two main reporting analytics solutions have been rolled out in this area leveraging the new BI software, data warehouses, and dedicated dashboards.

- **Outage analytics:** transactional data from the DMS/OMS is used for regulatory reporting requirements on supply quality (e.g., voltage, current, harmonics, etc.) and continuity (e.g., interruptions-related indicators such as SAIFI and SAIDI).
- **Operational analytics:** real-time data from the field is acquired by the SCADA system and presented into a dedicated operational analytics dashboard. This information is passed on to the EAM system to create maintenance notifications based on an asset's number of faults and supplier recommendations.

Not having significant data sets from preexisting systems, CLK will have to wait one or two years before it can deploy more complex, logic-driven algorithms. Data from the new systems will have to build up before data discovery, and more advanced analytics can be used to drive asset and investment decisions.

ESSENTIAL GUIDANCE

Project Impact Assessment

IDC Energy Insights recognizes CLK Enerji's program as a milestone transformation effort. It goes well beyond the yet vast technical IT and OT modernization work and extends into transforming the company's core processes and its organization. It will also generate positive externalities in the form of market efficiencies, ultimately fostering competition and contributing to further liberalization.

The technical work carried out over the past two years has provided CLK Enerji with modern IT and OT building blocks to respond to evolving regulatory and customer needs. It will revolutionize the way the company manages its network, making grid operation at one time more effective and nimble, while improving the quality of supply and reducing losses. It will support the company's vision to transform into a customer-centric energy supplier capable of providing a superior experience. In addition, process automation and commonality across the organization will enable CLK to make headway into improving performance across corporate functions.

On top of this, the extensive integration work will help CLK make the most of the IT and OT technology it has implemented and represents a solid foundation to develop future capabilities, while opting for a single design maximizes synergies and lowers the cost of ownership of the end-to-end solution.

Figure 4 presents IDC Energy Insights' project impact assessment for CLK Enerji's transformation program.

FIGURE 4

CLK Enerji's Transformation Program: Project Impact Assessment
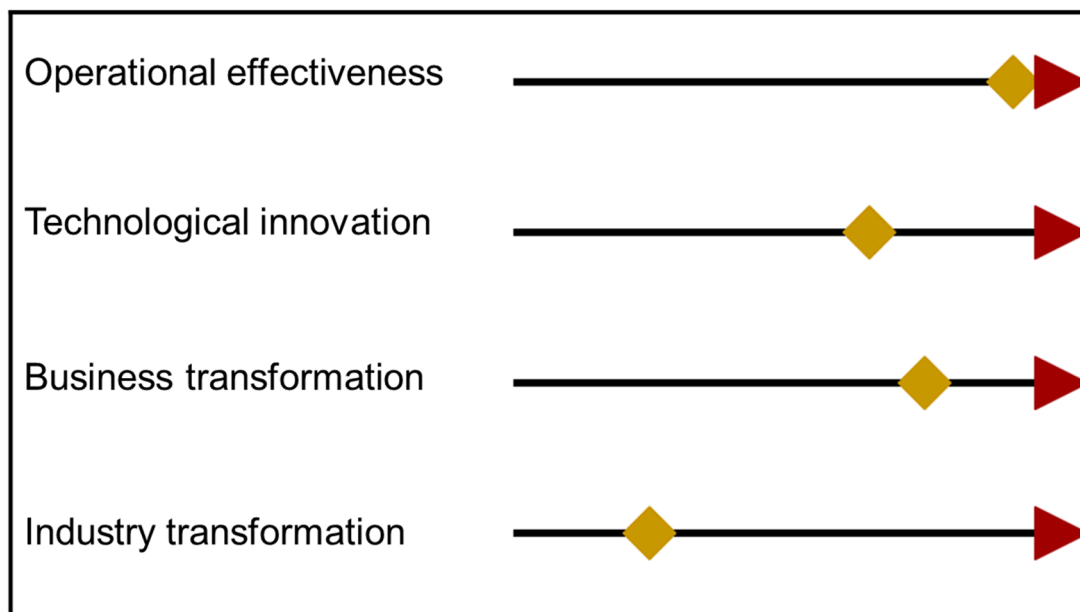
Source: IDC Energy Insights, 2016

Actions to Consider

Given the strategic nature of the program, its transformational impact on the organization and its processes, and the criticality of the systems involved, any utility approaching a similar transformation should consider the following:

- **Fully align the technological program and the business strategy.** Work on a precise definition of the expected value from the transformation program. Set major KPIs and then do all the process and technical design around those. Ultimately, for each and every technical implementation in the program, a precise business requirement has to be put forward and precise targets have to be implemented. In addition, when significant IT-OT integration activity is involved, be sure to spend enough time early on in the project to align the organizational structure of the company and the program plan.

- **Start looking into the technology at the earliest.** Invite solution vendors in at the process design stage to provide client-side advice and proof of concept, and increase understanding of what is possible and how it can best be developed. This will help bulletproof the architecture design, technical specifications, and final product selection. Leaving this for later could result in missed opportunities and higher cost of ownership.

- **Phase the program**. "Big bang" transformations maximize the impact but leave little room for error and make project management very complex. Once the final architecture has been designed, a phased rollout will limit the fallout should issues arise. Be sure to budget enough time for each activity, be it analysis or technical implementation. Never trade quality for speed.

- **Run a thorough change management program**. Getting employees who are accustomed to legacy IT systems to embrace the new can be a challenging proposition and can be met with resistance. Developing a behavioral change program to run in parallel with an IT implementation will help get buy-in and ease the rollout and uptake of the solution.

LEARN MORE

References

- Interviews with:
  - Serhan Özhan, Program Director and CIO, CLK Enerji
  - Abdullah Göker, Program Manager, CLK Enerji
  - Alper Kılavuz, Chief Enterprise Architect and Integration Project Manager, CLK Enerji
- http://www.clkenerji.com.tr/

Related Research

To learn more about enterprise transformation and the software solutions implemented, please refer to the following IDC Energy Insights documents:

- *IDC MarketScape: Worldwide Customer Experience Management Solutions for Utilities 2016 Vendor Assessment* (IDC Energy Insights #US40130216, April 2016)
- *IDC MarketScape: Worldwide Customer Care and Billing Software in Competitive Unbundled Energy Markets 2016 Vendor Assessment* (IDC Energy Insights #US40145616, April 2016)
- *IDC MarketScape: Meter Data Management Software for EMEA Utilities 2015 Vendor Assessment* (IDC Energy Insights #EMEA40706815, December 2015)
- *IDC MarketScape: GIS Software for EMEA Utilities 2015 Vendor Assessment* (IDC Energy Insights #EIRS01X, August 2015)
- *IDC MarketScape: North America Utility Distribution Management System 2015 Vendor Assessment* (IDC Energy Insights #EI255790, July 2015)
- *IDC MarketScape: Worldwide Energy Trading and Risk Management Software 2015 Vendor Assessment* (IDC Energy Insights #EI255242, April 2015)
- *IDC MarketScape: Worldwide Enterprise Asset Management Software for Energy and Water Delivery Utilities, 2014 Vendor Assessment* (IDC Energy Insights #EIOS06W, July 2014)
- *IDC MarketScape: Worldwide Utilities Mobile Field Force Management Software, 2014 Vendor Assessment* (IDC Energy Insights #EIOS04W, July 2014)

To learn more about case studies discussing best practices in utilities, please refer to the following IDC Energy Insights documents:

- *Best Practices: Supporting Nuclear Power Asset Safety and Reliability: Nuklearna Elektrarna Krško's Transition to Next-Generation Enterprise Software* (IDC Energy Insights #EIOS03X, June 2015)
- *E.ON UK Rebuilds Trust with Customer Engagement and Digital Transformation* (IDC Energy Insights #EISC05X, May 2015)
- *Best Practices: Beating Unaccounted for Energy with Big Data and Analytics: Baltimore Gas and Electric's Line of Attack* (IDC Energy Insights #EIOS02X, February 2015)
- *Northumbrian Water Transforming Field Service with Mobile Workforce Management* (IDC Energy Insights #EIOS01X, February 2015)

- *Best Practices: Reinventing GIS for the Modern Utility: The United Utilities Enterprise GIS Solution* (IDC Energy Insights #EIOS08W, September 2014)
- *Smart Customer Management: The First Utility Way* (IDC Energy Insights #EIRS03W, May 2014)
- *Think Big, Start Small, and Scale Fast: GDF SUEZ Energia Italia's Cloud CRM Platform Based on salesforce.com, Delivered by WebResults* (IDC Energy Insights #EIOS02W, March 2014)
- *Thames Water's AORTA: Wipro Enables Real Time Insights for Thames Water's Asset Operations* (IDC Energy Insights #EIRS03V, September 2013)
- *Best Practices: Anglian Water Moves Closer to a Smart Water Network With a Leakage and Pressure Management Solution* (IDC Energy Insights #EIOS03V, June 2013)
- *ScottishPower Trials Long-Range Radio for Smart Metering Communications* (IDC Energy Insights #EIRS53V, April 2013)
- *Best Practices: Low Carbon London, Promoting Innovation in the Distribution Network* (IDC Energy Insights #EIRS04U, December 2012)
- *Best Practices: Spotlight on Mobile Applications – Mekorot, Israel's National Water Company* (IDC Energy Insights #EIOS57U, September 2012)
- *Deep Dive into Smartcity Málaga Ranked #1 in IDC Smart Cities Index for Spain* (IDC Energy Insights #EIRS03U, May 2012)
- *Best Practices in Building Energy Management: Høje-Taastrup and Middelfart Municipalities Partner with Schneider Electric to Improve Buildings Performances* (IDC Energy Insights #EIRS01U, January 2012)
- *Best Practices: Portugal's Way of Driving Electric Mobility – The MOBI.E Project* (IDC Energy Insights #EIRS03T, October 2011)
- *Best Practices: Thames Water Adopts BPMS Solution to Streamline Its Customer Services, with Wipro as Systems Integrator* (IDC Energy Insights #EIOS05T, August 2011)
- *Best Practices: Veolia Water Transforming Metering – The m2ocity Innovative Business Model and Oracle Utilities MDM Deployed by Power Reply* (IDC Energy Insights #EIOS04T, May 2011)
- *Data Privacy and Security for Smart Metering: Alliander Certification Case Study* (IDC Energy Insights #EIOS52T, March 2011)
- *Best Practices: GasTerra Flexes up Its IT Application Portfolio by Choosing Oracle Utilities Solutions* (IDC Energy Insights #EIOS03S, May 2010)
- *Best Practices: Mobile Work Force Management Solution, Enel Style* (IDC Energy Insights #EIOS02S, February 2010)
- *Best Practices: Palm Utilities Deploys Oracle Utilities Customer Care and Billing Solution* (IDC Energy Insights #EIOS08R9, October 2009)
- *Best Practices: Electric Vehicle Enabling in Denmark – The EDISON Consortium Project* (IDC Energy Insights #EIRS02R9, October 2009)
- *Best Practices: Pioneering Smarter Metering in Gas – The Gas Natural AMM Project Case Study* (IDC Energy Insights #EIOS06R9, September 2009)
- *Iberdrola's Control Center for Renewable Energy (CORE): A Model for Grid Integration of Renewable Energy* (IDC Energy Insights #EIRS54Q, June 2008)
- *Utility Remote Wind Power Management: EdP Bets on Logica's IT Solution* (IDC Energy Insights #EIRS53Q, April 2008)

Synopsis

This IDC Energy Insights study looks at the extensive transformation program currently ongoing at the Turkish utility group CLK Enerji. The group's eight operating companies collectively distribute and sell nearly 46TWh of electricity per year to around 10 million customers, making it the country's largest electricity utility. The program was initiated in 2012, right after CLK Enerji formed in the wake of the sector's privatization. It aims at entirely modernizing the processes, network, and technology across the group's distribution and retail operations as well as corporate functions.

The study analyzes the program's market determinants and its objectives across CLK Enerji's functions. It describes the end-to-end technical solution and its deployment, including the individual components and principles governing the implementation effort. Finally, it provides a view of the long-term business value expected from the transformation, including some of the benefits already achieved.

"The CLK Enerji story was selected because of the ambitious scale, vision, and approach adopted to transforming the business and technology amid the sweeping change hitting the energy landscape in Turkey," said Jean-François Segalotto, senior research analyst, IDC Energy Insights. "The program extends to virtually all business processes and the whole IT and OT stacks, unifying them across all the group's operating companies."

About IDC

International Data Corporation (IDC) is the premier global provider of market intelligence, advisory services, and events for the information technology, telecommunications and consumer technology markets. IDC helps IT professionals, business executives, and the investment community make fact-based decisions on technology purchases and business strategy. More than 1,100 IDC analysts provide global, regional, and local expertise on technology and industry opportunities and trends in over 110 countries worldwide. For 50 years, IDC has provided strategic insights to help our clients achieve their key business objectives. IDC is a subsidiary of IDG, the world's leading technology media, research, and events company.

Global Headquarters

5 Speen Street
Framingham, MA 01701
USA
508.935.4400
Twitter: @IDC
idc-insights-community.com
www.idc.com