



> Solution Brief

Business Impact

“Revenue (energy) theft analysis is usually the main driver for smart metering deployment in regions with a high level of nontechnical losses that have a significant impact on a utility’s financial performance.”

Top Use Cases for Meter Data Analytics Across the Utility Value Chain
Zarko Sumic, Gartner, Inc.
3 June, 2015



Challenges

- **Incomplete view of network relationships.** It’s hard to collect data from disparate energy consumption and feeder systems and bring it together with other information outside the metering area.
- **Isolation.** Lacking timely and comprehensive customer insights, many fraud teams miss opportunities to pass critical information to customer-facing teams.
- **Inefficient use of resources.** Lacking comprehensive data, visualization tools, interactivity and prioritized alerts, investigators cannot be highly productive.
- **Simplistic analytics.** Many systems rely on rules, generate false positives and can’t adapt to changing loss patterns.

Detect Nontechnical Loss Accurately and Efficiently to Reduce Energy Theft

The Issue

Theft of service is a global concern. Fueled by poor economies and increased technical savvy, crimes such as meter tampering and multi-party fraud schemes are both easy to commit and hard to detect. As a result, fraudulent activity continues to grow and attract a variety of “professional” criminals. A utility can lose as much as 10 to 30 percent in revenues each year to theft, and more than two-thirds of that loss is within the relatively small commercial account sector.

Only a fraction of the nontechnical losses due to fraud are ever detected using historically available detection techniques. And because of the post-payment nature of electrical consumption (with few exceptions), outstanding debt caused by energy theft has low recovery rates. SAS’ fraud solution can improve detection of energy theft, shortening analysis from weeks to minutes and allowing utilities to mitigate theft within a billing cycle, reducing losses by millions. During the fraud detection process, manual billing errors, meter malfunctions, network topology errors and illegal connections may also be discovered.

Our Approach

To defend against nontechnical loss, you must be able to detect suspicious activity and hidden relationships in data associated with smart meters, communications networks, call centers, socio-economic data, meter repairs and replacements, meter tamper and inspection data, billing data and case referrals. SAS software and services can help you:

- **Improve information credibility** by integrating disparate data sources regardless of format, and applying embedded data quality techniques to ensure accuracy.
- **Find theft faster** using advanced analytics to uncover hidden relationships, detect subtle behavior patterns, prioritize suspicious cases and predict future risks.
- **Enhance audit and investigation effectiveness** by visualizing data from multiple angles to predict future risks, uncover hidden relationships and detect subtle, suspicious patterns of behavior.
- **Measure program performance** through a dashboard that lets you define and monitor key performance metrics.

SAS provides a holistic, customer-centric view of fraud that’s unrestricted by data source or channel.

The SAS® Difference: A comprehensive fraud framework for utilities

From advanced analytics for fraud detection through alerts and case management, SAS gives utilities a comprehensive fraud framework to address nontechnical losses. With SAS, you get:

- **Integration with existing IT infrastructure.** SAS facilitates information flow across departments and functions, and supports future technologies and processes.
- **Detection and alert generation.** Based on a combination of heuristic rules, anomaly detection, predictive modeling and social network analysis, SAS automatically routes suspicious cases for review, and uncovers suspicious activity in real time.
- **Alert management capabilities.** Alerts from multiple monitoring systems are associated with common individuals or entities, and potentially fraudulent cases are automatically prioritized and routed to appropriate team members.
- **Social network analysis.** By analyzing all related activities and relationships at a network level, SAS detects and prevents organized energy theft.
- **Case management.** SAS promotes systematic investigations, enabling you to capture and display all information pertinent to a case without duplicate data entry.

To detect potentially fraudulent activity, SAS provides data management and advanced analytics capabilities that leave no stone unturned when collecting and analyzing data.

Case Study: A National Electric Utility

Situation

With a service population of 3.3 million, this utility knew individuals were tampering with meters to get lower consumption readings. It also found errors in technical loss computations. Estimated overall nontechnical losses were around 1 percent, equaling 40 million to 50 million euros (US\$52.5 million to \$65.6 million) annually in revenue loss. The utility's simple automated detection system identified only 0.1 percent of all fraudulent activity. The rest was found manually, or not at all.

Solution

SAS analyzed more than 300 variables for each of the 3.3 million customers to build models that identified aberrant energy consumption behaviors. After accounting for seasonality, SAS Analytics found loads greater than three standard deviations, voltage out of range, reverse flow, power equation anomalies, and missing or intermittent data reads.

Results

After implementing SAS, the utility:

- Improved its predictions for illegal usage by a factor of eight.
- Verified 2,000 fraud cases based on data analysis alone, valued at 5 million euros.
- Flagged an additional 200,000 potential fraud cases for further investigation.

What if you could ...

Base decisions on trusted data

What if you could enhance information credibility by integrating disparate data sources and formats, and applying embedded data quality techniques?

Automate tests that detect load anomalies

What if you could use advanced analytics and autoregressive forecasting to identify fraud quickly - determining what customer load would have been if the theft hadn't occurred?

Promote investigator efficiency

What if you could enhance investigators' proficiency by providing them with a web-based environment and prioritized alerts?

Quickly see areas of high and low performance

What if you could improve case resolution by monitoring KPIs in a dashboard environment?

You can. SAS gives you THE POWER TO KNOW®.

SAS Facts

- SAS helps customers at more than 75,000 sites improve performance and deliver value by making better decisions faster.
- Advanced data mining from SAS enables analytics on both structured and unstructured data to reveal hidden fraudulent activities.
- IDC ranked SAS as the leader in the [Worldwide Credit Risk Analytics Solutions 2014 Vendor Assessment](#).

Learn more about SAS software and services for utilities at sas.com/utilities