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IGSAS

A New Option in Utility Service on Military Installations

1 HISTORICAL GOVERNMENT UTILITY CONTRACTS

Historically, military installations have relied on Base Operations Support Services (BOSS) contractors for utility operations, often resulting in limited responsibility and long-term maintenance incentives. In response to the need for improved maintenance and funding, the Federal Government initiated Utility Privatization (UP) contracts in the 1990s. UP contracts transfer ownership and operation of utility systems to the private sector for a fixed period, typically 50 years. These contracts aim to enhance the quality, efficiency, and reliability of utility services through private sector expertise and funding.

While there are other military installation utility service contract types, including Utility Energy Service Contracts (UESC) and Energy Savings Performance Contracts (ESPC), recently, *there has been a shift towards Utility Inter-Governmental Support Agreements (IGSAs), which foster collaboration between military installations and local governments or agencies and better align the long-term incentives for operating and maintaining the military-owned utility distribution systems.*

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2 SERVICE AGREEMENTS / CONTRACTS VS TYPICAL OPERATIONS

Privatization and other military service agreements, unless specifically indicated otherwise, do not include the supply of commodities, such as electric power, water, or natural gas, but simply involves ownership, operation, and maintenance of the physical

LOOK FOR US
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APRIL 30-MAY 2
IEEE Rural Electric Power Conference
Tulsa, OK

MAY 12-15
NWPPA Annual Conference
Salt Lake City, UT

JUNE 9-12
APPA National Conference
San Diego, CA

UPCOMING WEBINARS

Hi-Line Engineering is excited to offer 12 new **EV-Related** Webinars in 2024!

2024 Electric Vehicle (EV) Webinars Series

MAY 21
Load Management (Part 1)

JUNE 4
Load Management (Part 2)

2024 Industry Issues & Standards Webinars Series

MAY 14
Overview of Arc Flash

JUNE 11
Single Phase Metering

Note *All webinars are recorded & available for viewing post-presentation* distribution systems over time. The System Owner charges the Government a rate for providing "distribution service." The terms of the service agreement or contract include things like operations, maintenance, and capital projects. Due to supply of commodities not being included in the scope, cost recovery for these contracts and agreements works differently from traditional utility rates. The military installation receives service from the commodity provider up until a Point of Demarcation (POD). Starting at that POD, the distribution system operation and maintenance responsibilities now belong to the System Owner, as well as plant replacement as funding is available.

This presents a challenge to traditional utilities when determining the appropriate pricing structure for a military distribution system privatization agreement. Most cooperatives and municipalities charge their retail customers on a consumption basis; they aren't contractors who typically price their work based on labor, materials, etc. Moreover, these contracts / agreements are based on a fixed price with predetermined price adjustment methods and timeframes. Utilities operate in a very fluid business cost environment. While costs can be forecast to a degree, it's atypical to sit down and assign cost based on factors more commonly used by contractors, such as labor, materials, and transportation, for the operations and maintenance of a distribution system.

3 HISTORY OF IGSAS

In recent years, IGSAs have emerged as an option for military installations to procure services from external utility companies. These agreements, established between the US Department of Defense (DoD) and various federal, state, local, or tribal governmental entities, facilitate resource sharing across different governmental entities. Initially developed for installation support services such as dog-catching, recycling collection, or elevator maintenance, IGSAs enable military installations to access services already offered by local governments to their citizens or retail rate payers.

Unlike traditional procurement processes governed by the Federal Acquisition Regulation (FAR) and Defense Federal Acquisition Regulation Supplement (DFARS), IGSAs allow the DoD to engage in sole-sourcing agreements, fostering a collaborative approach with installations rather than competitive bidding against other contractors. This flexibility enhances cooperation between military installations and local governments, streamlining the process of accessing essential services while promoting efficient resource utilization.

4 MILITARY INSTALLATION UTILITY IGSAS

In 2021, the DoD began exploring the idea of applying the IGSA concept to entire installation utility systems. IGSAs are very comparable to UP contracts. The major difference between an IGSA and a traditional UP contract is ownership of the system. Under the UP framework, the contract includes ownership of the system for the duration of the 50-year contract. Under an IGSA, the military retains ownership and hires the municipality to operate, maintain, and repair the system.

The military's reliance on IGSAs for utility system maintenance stems from its strategic objective to foster local relationships, engagement, and utilize local resources efficiently. This trend reflects a broader shift towards community integration and collaboration. For instance, Redstone Arsenal in Alabama has established IGSA agreements with the local municipality to maintain utility systems, leveraging the expertise and resources available within the community. Similarly, Fort Carson Air Force Base in Colorado has forged partnerships with local entities to ensure the seamless operation of utility services critical to both military personnel and nearby residents. This symbiotic relationship is further evidenced by the fact that many customers of local municipal utilities are also employed at military installations, underscoring the interconnectedness between the military and the surrounding community. By aligning long-term incentives and initiatives, both military installations and municipalities strive to ensure the sustained functionality and resilience of utility systems while enhancing overall community welfare and cohesion.

WHO / WHERE: Unlike the previously utilized contract types, IGSAs are limited in what utilities are eligible. The IGSA program is specifically geared towards local municipalities, not cooperatives and for-profit utility companies. The goal of an IGSA is to utilize the services provided by the local government.

WHY: IGSAs have both ***advantages*** and ***disadvantages*** when compared to the historically more common UP contracts.

ADVANTAGES

- **Maximum term of 10-years, making it a shorter-term option when compared to the 50-year terms required in UP contracts.**
- **Due to the military installations ability to sole-source IGSAs, they are more transparent about what they really need. This allows both parties to collaborate and determine the best way to operate and maintain the system to meet the requirements of both the utility and the installation.**
- **IGSAs are more flexible, due to being "agreements" rather than "contracts". As conditions change, either party to the agreement can sit down and make adjustments as the need arises, rather than the more formal and rigid "Request for Equitable Adjustment" process used in UP contracts.**
- **IGSAs are exempt from traditional contracting statutes and regulations, such as FAR and DFAR clauses, and does not have to comply with a typical federal subcontracting plan.**

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DISADVANTAGES

- **These agreements have a maximum term of 10 years. While they can be renewed, it's not a guarantee.**
- **Due to it being a Public-Public partnership program, only municipalities are eligible to participate. UP contracts are also open to cooperatives, IOUs, and contractors.**
- **In UP contracts, the contract owners have significantly more autonomy compared to municipalities with IGSAs because of the ownership structure inherent in UP contracts. In UP contracts, the private entity or contractor typically owns the utility systems outright. This ownership gives UP contract owners full control over the management, maintenance, and upgrades of the utility infrastructure. They have the authority to make decisions regarding system operations, investment in upgrades or expansions, and setting rates for the services provided.**

HOW: If a municipal utility company is interested in initiating an IGSA with a local military installation, there are some proactive measures they can take.

1. **Do their research on the installation.** *Understand the utility needs, as well as the style of contract the installation currently utilizes for their utility systems. BOSS contracts are shorter term than UP contracts. If the system has already been privatized, it's less likely that the installation will be interested in or have the option to engage in an IGSA.*

2. **Identify points of contact.** *Not only should the municipality identify the appropriate points of contact in the military, but also look internally. Does the installation already reach out to the municipality for help? Who do they work with? Identify any preexisting relationships.*

3. **Engage in initial discussions and gauge interest.** *Because IGSAs can be sole sourced, the DoD doesn't have to formally start the process. Municipalities can initiate discussions with the military installation's leadership or relevant decision-makers to express their interest in exploring the possibility of an IGSA.*

All-in-all, **IGSAs are an exciting, new option to provide quality utility service to military installations. The overall flexibility and collaborative process make for an agreement that provides benefits to the installation, the municipality, and the community at large.**

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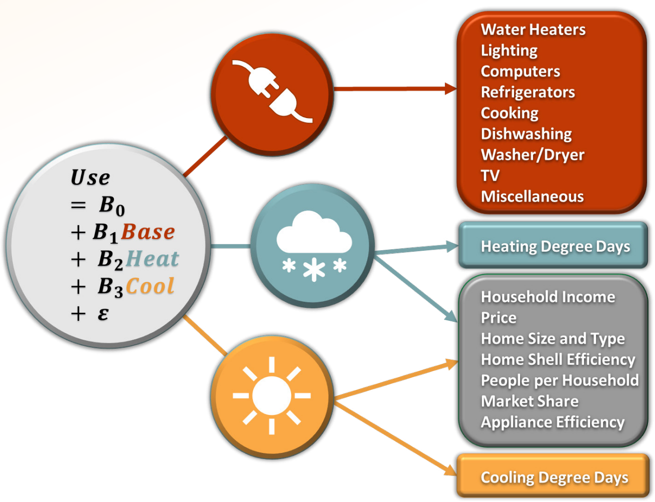
The Increasing Challenges in LOAD FORECASTING

The load forecast, or for the old hands among us, the power requirements study, is a useful planning tool, undergirding efforts such as budgeting, integrated resource planning, and energy efficiency/demand response market potential studies. As I like to say about a load forecast I've developed is that it's guaranteed to be wrong or your money back! And of course, everyone realizes that planning in the future is difficult since the future of energy is fraught with uncertainty. *And for load forecasters and planners, recent trends have increased the challenges of developing the best possible load forecast.*

Essentially from the time of rural electrification until about the mid-1990s, forecasting was a relatively uncomplicated process – load was directly tied to economic growth and therefore basic econometric models were usually sufficient for producing reasonable forecasts. Then as conservation and energy efficiency efforts increased, load and economic activity began to decouple, especially in the residential sector. We began to see economic growth but flat or downward trends in household consumption as homes became more efficient, even when utilities were not pursuing energy efficiency programs. So, energy forecasting evolved to capture these effects through a variety of approaches: end-use modeling, statistically adjusted end-use modeling [see Figure 1], and econometric approaches with greater focus on developing independent variables that captured the efficiency trends. And now within the last five-to-ten years, new developments in the industry are once again challenging load forecasters in ways that could have significant impacts on other planning studies. This article will touch briefly on three such trends, saving what might be the hardest challenge for last.

Figure 1. ***Statistically Adjusted End-Use Models***[1]



BENEFICIAL ELECTRIFICATION

In the distant past, electric utilities encouraged additional energy sales, especially off-peak energy sales, through programs designed to encourage fuel switching. Such programs were called strategic load building or valley filling programs. Such programs became disfavored at the turn of the century as climate concerns generated negative political pressure on associations of encouraging increased electricity consumption for the sake of growth. In recent years, the concept has returned, with modification, in the guise of beneficial electrification, in which the concept is to replace direct fossil fuel use with electricity in a way that reduces overall emissions or environmental impact. Beneficial electrification includes electric vehicle adoption, which will be discussed in more detail later, but also replacement of other appliances that might represent reduction in greenhouse gas emissions, such as replacement of gas appliances with electric. In such fuel switching instances, forecasters for both electric and gas utilities must consider electrification effects.

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Considerations for forecasters include:

- **Will the utility have a formal electrification program? If so, program impacts will likely be estimated during the planning and potential development stages of program design.**
- **How might natural electrification, driven by political and media attention, impact future market shares of electric end-use appliances. In such instances, an end-use or SAE modeling approach can help both electric and gas utilities understand how changing market share in appliances will impact future sales.**
- **Should impacts be modeled as part of base case forecast assumptions or built into scenario forecasts?**

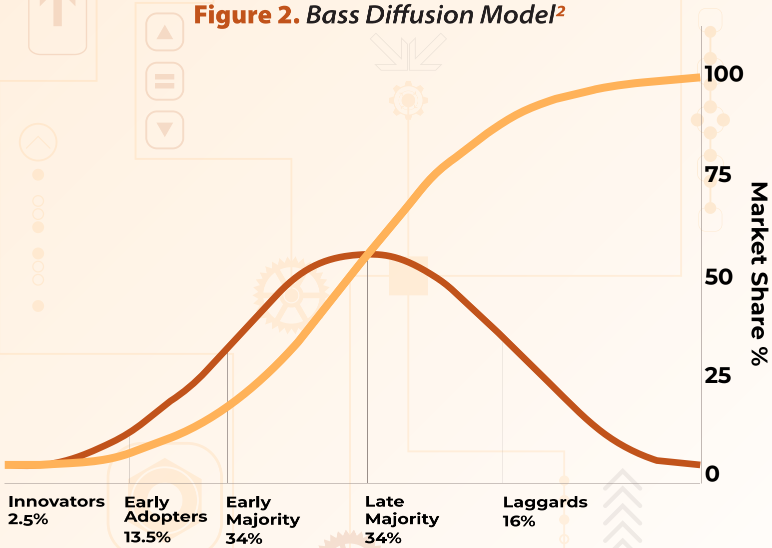
ELECTRIC VEHICLES

We've been trying to understand the impact that electric vehicles (EV) will have on forecasts and energy planning for some years now, so the sources a forecaster can rely on are more well-developed than the other issues forecasters are struggling with. However, EVs do still represent a challenge because for most utilities (some in California may be an exception), they are not well represented in the historical record that our forecast model rely upon. Therefore, forecasters are forced to perform post-modeling adjustments in which they independently project the specific impacts that EV will have on the system and then adjust the base case forecast.

Critical questions for the forecaster to consider include:

1. **How many electric vehicles are currently on the system? State motor vehicle registration databases can give some indication.**
2. **How fast will electric vehicles be adopted? There is a confounding number of sources a forecaster can draw upon for supporting information here, including quantitative (national adoption projections from various researchers and thinktanks) and qualitative (automaker manufacturers' propagandized goals for electrifying their fleets). There are also decisions to make regarding adoption rates within the utility's service territory. For instance, a rural cooperative with little interstate coverage in its territory might expected slower adoption than national rates. Finally, technical a consideration can be made as to whether to use linear growth assumptions or something more sophisticated like a Bass diffusion curve, which comes with an additional set of assumptions to make** [see **Figure 2**].
3. **What is the average commute in miles and how many kWh of electric load are represented by the mileage?**
4. **What is the mix of makes and models of electric vehicles, as they have different electrical draws during charging?**
5. **How many cars do homeowners own on average in the service territory and how often are cars replaced?**
6. **What is the share of charging at home on Level 1 and Level 2 chargers vs. away from home on DC Fast Chargers?**
7. **When are cars being plugged in and are chargers being programmed to charge immediately or on a delayed/managed basis?**
8. **What to do about non-residential electrification, such as school buses, delivery vehicle fleets, government fleets, and others?**

Figure 2. *Bass Diffusion Model*[2]



With so many questions to answer, a forecaster might choose a simplified approach of trying to answer many of these questions with a simple assumption of "we'll have 10% of vehicles within 20 years and a typical vehicle will require 400 kWh per month to charge". ***Alternatively, a complex forecasting model that attempts to measure and answer all of the above questions can also be developed.***

NEW LARGE LOADS

For many utilities, forecasting large commercial and industrial loads is so difficult that the traditional approach has been to hold such loads constant into the future only making adjustments for expansions, contractions, and new loads based on highly likely known changes. Of course, "highly likely" is a very loose term. Furthermore, the forecaster must taking into account that the demand and load factor assumptions a developer or customer gives to the utility for new load is often overstated. The forecaster relies upon key account representatives and information gleaned from regular discussions that utility management often has with such loads.

However, that is beginning to change in ways that could have drastic implications on planning at the utility and regional level. Entering the conversation are very large loads with high load factors: data warehouses, cryptocurrency mining, artificial intelligence centers, and indoor agricultural facilities. The expansion for these loads is seemingly exploding right now, ranging in size from just a few MW to upwards of 1,000+ MW at one site! Developers are looking for the best deal for power and canvasing entire regions of the country looking for deals from different utilities. The challenge for a forecaster at any one utility is, how to include such opportunities in a load forecast? After all, one successful contract could double or triple a rural cooperative's peak demand. Just because a developer has feelers out or even is negotiating basic contract terms means the full load will come to fruition. Utilities, especially Investor Owned Utilities with large service territories, are taking a harder look at including something for these loads in a load forecast.

Considerations for the forecaster include:

- **What probability of likelihood should constitute inclusion in the forecast? Maybe enterprising forecasters will begin to assign probabilities and track their accuracy going forward. Or figure out a good use of Bayesian inference.**
- **What discount should be applied to estimate load impacts? Estimates by developers, customers, and even key account representatives are often overstated.**
- **Go with a stochastic approach, add unspecific "economic development" load, or only go with those that can be named and reasonably measured? A Monte Carlo simulation approach might allow for running various scenarios.**
- **Include such growth in the base case or in scenario or range forecasts?**
- **Should regional or market planners worry about multiple utilities counting on the same load potentials given developers tend to shop around?**

CONCLUSION

The onset of beneficial electrification, including electrification of North America's vehicle fleet, and potential very large loads associated with data warehousing and data mining are the new difficult cases for load forecasters. There are methods that are being developed, deployed, and refined over time, so the industry will continue to evolve. It is important to know, though, that these changes in how we use power have profound implications not just on forecasting, but on planning too. Distribution grid impacts could be significant from an influx of electric vehicles or aggressive electrification efforts. Similarly, gas systems should try to understand the impact electrification efforts will have on their utilities. And a single very large industrial load can represent significant system planning impacts, no doubt. Importantly, though, given the size of such projects and the lack of clarity concerning whether they will interconnect and when creates very real difficulties for long-term integrated resource planning. So we all should work with our forecasters to develop the best methods we can to predict electricity and gas needs into the future under scenarios driven by evolving trends. ■

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[1] SAE models represent a hybrid between traditional econometric and end-use forecasting techniques. Econometric methods, in which economic activity is used an a regression model as a proxy for factors driving growth in sales, can sometimes fail from the fact that conservation efforts have lead to a dissociation from economic growth and underlying energy sales (e.g., as household income goes up, energy sales do non necessarily go up as well because of energy efficiency and conservation impacts). End-Use models can correct for that difficulty, but require detailed modeling of the system under study. The data, time, and effort to put together a reasonable end-use model can be prohibitive for many utilities. An SAE approach draws from the best of both worlds, in which end-use information is captured into end-use indexes, which can represent economic activity and changes in appliance market shares and efficiency. These indexes are then run through a regression equation to statistically fit the series to historical energy usage information. In such a way, the level of specificity required is lesser than would be required for a traditional end-use engineering model.

[2] The Bass Diffusion model is an equation that is intended to model the adoption of new products in a population. Conceptually, model allows for a defining cumulative market share of a product over time to grow through the phases of innovators, early adopters, early majority, late majority, and laggards. The resultant curve is often an "S" curve for adoption (see yellow line in the figure). However, using the bass diffusion model comes with its own difficulties, as a modeler must estimate a coefficient of innovation and a coefficient of imitation. These factors impact the shape of the S-curve and can do so significantly. These are not readily available but can be estimated based on experiences with similar products or use of industry norms.

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