

# Esri News

## for Electric & Gas Utilities

2014

### Solar Power for the German Grid

Lechwerke Improves Customer Service

Lechwerke (LEW), a major, regional electricity supplier in southern Germany, provides 500,000 citizens in Bavaria with energy. LEW has a mostly rural distribution area, which overlaps an area in Germany with one of the highest amounts of solar irradiance in the world. Thus, LEW receives approximately 900 applications every month to feed photovoltaic power into the grid. Mostly, the applicants are farms that use large rooftops to generate solar energy and earn some money. There are also quite a number of solar parks.

By law, photovoltaic plants generating fewer than 30 kilowatts must be connected without charge, and those generating

more than 30 kilowatts must contribute to the cost of grid extension. LEW wants to keep costs for infrastructure investments to a minimum given the exponential growth of renewable-energy generation in its distribution area. Therefore, the company uses GIS from Esri to redirect electricity through less frequently used parts of the grid by adapting switch positions.

Even without adapting switch positions, the new input to the network must be checked and calculated. This check is done by a dedicated team of 60 experts at LEW. The check involves network calculation (Can the network and the transformers

continued on page 11

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↑ Farms in southern Germany use large rooftops to generate solar power.

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# Early Is On Time for Esri UC

It happens every summer in San Diego. It's the biggest GIS event of the year, and 99 percent of attendees say they recommend it. It's the Esri UC, where GIS users from around the world unite to trade ideas, build skills, and solve problems. United we speak, listen, dance, run, sing, and celebrate. United we move technology forward. United we transform our world. United We Map.

Esri UC is your opportunity to meet and share solutions with electric and gas professionals from around the world. You will also have firsthand access to experts in utility solutions from Esri as well as Esri's extensive partner network. Join the Electric and Gas Utility Kickoff Session, the special interest group meeting, and the Electric and Gas User Group (EGUG) Reception, to be held Tuesday, July 15, 2014.



Register for Esri UC today.  
Visit [esri.com/uc](http://esri.com/uc).

Our thanks go to the sponsors of the special interest group meeting and EGUG Reception at the 2013 Esri UC.

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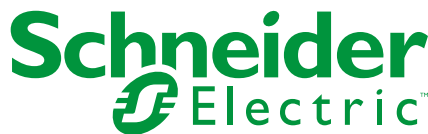
# 2013 Electric and Gas GIS Conference in Review

More than 500 utility professionals from around the world gathered October 20–23, 2013, in San Antonio, Texas, for the Esri Electric and Gas GIS Conference.

The event was designed to help utility professionals advance their networks—utility network, social network, and IT network.

## Thanks to our 2013 EGUG sponsors.

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## Thanks to the 2013 EGUG Officers

Esri thanks the EGUG officers for their participation in producing this event:



↑ (from right to left) President Wayne Meyer, SCANA; Vice President William Wickersheim, Burbank Water and Power; and Conference Chair James Trevino, CPS Energy

## Energize Your Networks

### 2014 Esri Electric and Gas GIS Conference

Make plans to attend October 26–29 in Memphis, Tennessee.

#### Why Should You Attend?

- See the latest maps, apps, and solutions for utilities.
- Stretch GIS beyond mapping to secure funding, upgrade infrastructure, and drive marketing.
- Approach new government regulations with knowledge-driven analysis.
- Get ready for emergencies and outages by taking maps to the field and sending data to the cloud.
- Network with peers to learn best practices and receive industry recognition.
- Find out how to use ArcGIS as a platform and increase return on investment.

Visit [esri.com/events/electric-gas](http://esri.com/events/electric-gas).



# Introducing the 2014 EGUG Officers

The Electric and Gas User Group (EGUG) is an active community of people dedicated to sharing Esri technology information, ideas, and experiences in the electric and gas industry.

By joining EGUG, you will benefit from intellectual collaboration with and the personal inspiration of your peers. Discuss GIS solutions for the electric and gas industry with users from around the world, as well as Esri staff.

Not an EGUG member? Membership is freely open to all Esri technology users, user organizations, and Esri partners. Join EGUG at [esri.com/egug](http://esri.com/egug).

President	Vice President	Conference Chairs
William Wickersheim Burbank Water and Power	Mark Vlaich Laclede Gas Co.	Arnisa Davis (left) and Sherra Russell (right) Memphis Light, Gas and Water (MLGW)
		 

## Esri Introduces ArcGIS for Electric and ArcGIS for Gas

Esri recently released ArcGIS for Electric and ArcGIS for Gas—ready-to-use maps and apps designed for utilities. Both are freely available to Esri customers. Developers and utility experts at Esri spent years studying industry needs and trends to come up with solutions that will help utilities quickly respond to outages and engage with customers.

"It's never been easier to geoenable your utility," said Bill Meehan, Esri's director of utility solutions. "ArcGIS for Electric and ArcGIS for Gas will help utilities get much more value from their data. More than that, this is a chance for utilities to truly revolutionize their business."

ArcGIS for Electric includes damage assessment and streetlight problem apps along with a public outage viewer to help utilities communicate with customers during an outage. ArcGIS for Gas includes damage assessment apps and an exposed-pipe collector app. Both applications also help Esri customers get started quickly with ArcGIS Online, where they can create and share interactive maps and apps. They can also access ready-to-use content, apps, and templates available for the web, smartphones, and tablets.

Visit [esri.com/ag4e](http://esri.com/ag4e) and [esri.com/ag4g](http://esri.com/ag4g).

## On the Road

### SAP Conference for Utilities

April 8–10

Mannheim, Germany

<http://uk.tacook.com/events/conferences/details/sap-conference-for-utilities.html>

### IEEE PES Transmission & Distribution Conference and Exposition

April 14–17

Chicago, Illinois, USA

[www.ieeeet-d.org/](http://www.ieeeet-d.org/)

### Esri Petroleum GIS Conference

April 23–25

Houston, Texas, USA

[esri.com/events/petroleum-energy](http://esri.com/events/petroleum-energy)

### UTC Telecom

May 6–9

Phoenix, Arizona, USA

[www.utc.org/sites/UTCTELECOM2014/](http://www.utc.org/sites/UTCTELECOM2014/)

### SAP Asia Pacific Conference for Utilities

May 20–22

Singapore

<http://asia.tacook.com/saputilities>

### Esri International User Conference

July 14–18

San Diego, California, USA

[esri.com/uc](http://esri.com/uc)

### SGA Operating Conference & Exhibits

July 22–24

Houston, Texas, USA

[www.southernngas.org](http://www.southernngas.org)

# How Hart EMC Implemented ArcGIS Online for Improved Inspections

By Skye Perry, SSP Innovations

Recently, Hart Electric Membership Corporation (EMC), located in the US state of Georgia, implemented a new asset inspection program using ArcGIS Online. Hart EMC purchased 30 iPads for field crews.

Russell Shirley, Hart EMC manager of technical services, worked with Esri partner SSP Innovations to take the system to a new level and enable Hart EMC's inspection program using real-time integration with the back office.

"We needed to get the inspections project up and running quickly, so we leveraged SSP's experience and toolset, along with ArcGIS Online, and had a working solution in one week," said Shirley. "That's the kind of solution a cooperative with limited GIS resources like ours needs. Overall, I would call this a very successful ArcGIS Online story, and it was a heck of a lot of fun to put it together."

## Targeted Inspection Features

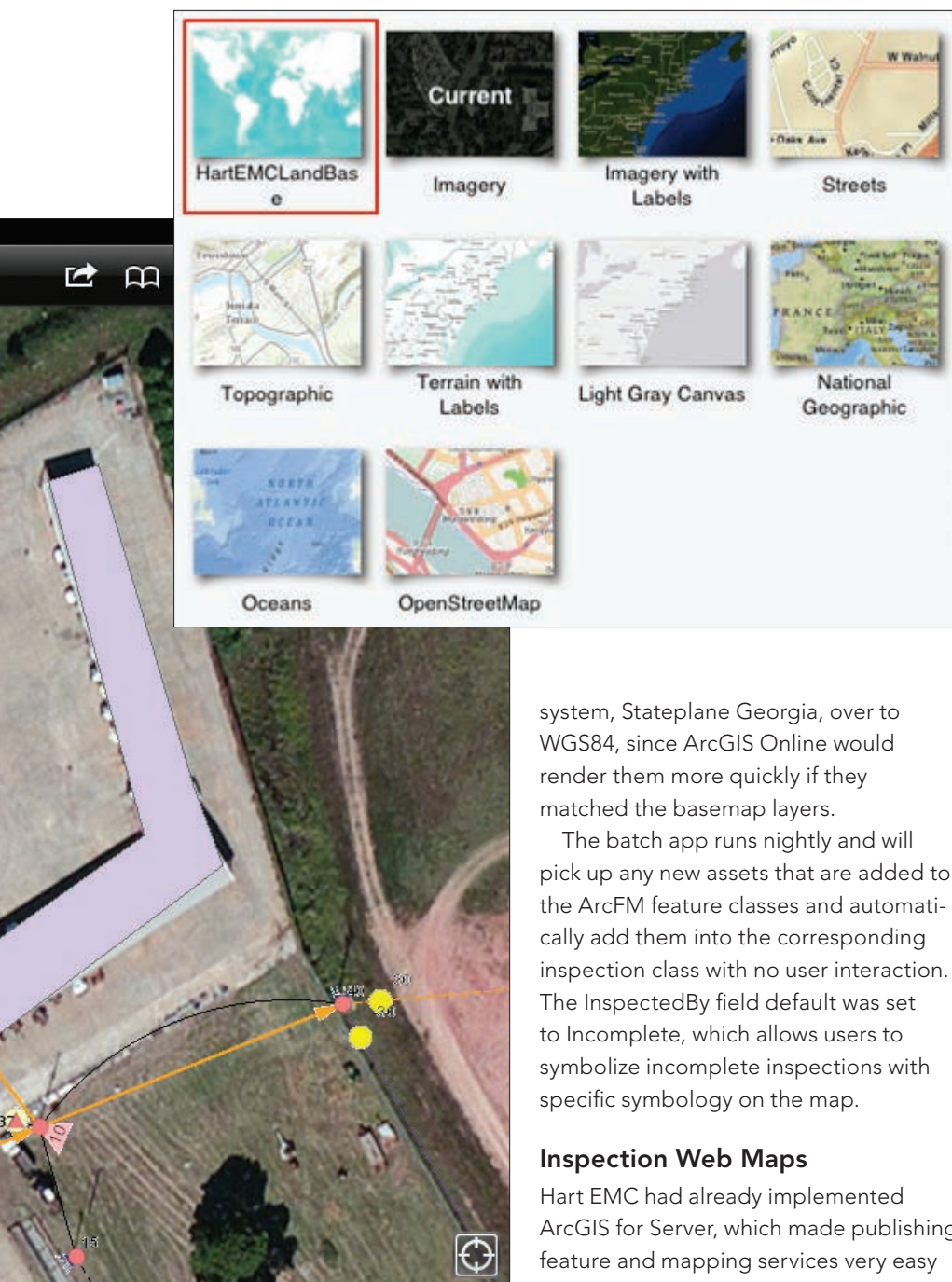
The first configurable batch application was responsible for moving targeted assets from their native ArcFM versioned feature classes into new inspection feature classes.

The batch app allows Hart EMC to configure the source and destination classes, the facility ID fields, the target inspection year, and even a pattern for determining the default values for the inspections. For example, for a pole inspection, the default Anchor inspection fields would be set to N/A if there was no Anchor assembly object related to the pole.

The same idea was applied for transformers using a purely spatial relationship. If no transformer was present on a pole or pad, all the transformer inspection fields would default to N/A. If a transformer was present, the default becomes the rated KVA inspection field using the data from the transformer record.



↑ After a single run of the application, the Hart EMC team had prepopulated targeted inspections. Using the custom basemap allowed users to zoom in to the same scales achieved in ArcGIS for Desktop.



The goal was to set up each inspection record with as many defaults as possible to limit the time an inspector would have to spend editing the record. The team created the batch app in a manner that would allow Hart EMC to easily add inspection classes at any time in the future using any database or spatial relationship to fuel various inspection fields.

Next, within the batch app, the team was able to reproject the inspection features from their original coordinate

system, Stateplane Georgia, over to WGS84, since ArcGIS Online would render them more quickly if they matched the basemap layers.

The batch app runs nightly and will pick up any new assets that are added to the ArcFM feature classes and automatically add them into the corresponding inspection class with no user interaction. The InspectedBy field default was set to Incomplete, which allows users to symbolize incomplete inspections with specific symbology on the map.

### Inspection Web Maps

Hart EMC had already implemented ArcGIS for Server, which made publishing feature and mapping services very easy in ArcGIS for Desktop. The team published a mapping service of all the ArcFM facility data to use as reference data, then published a feature service for each inspection class. The result was a web map that showed all the targeted inspections as red features.

Team members could switch between any of the Esri basemaps using web maps. However, in some congested areas, they were not able to achieve the scale they needed to be able to see the detailed assets. To give the inspectors

**“We needed to get the inspections project up and running quickly, so we leveraged SSP’s experience and toolset, along with ArcGIS Online, and had a working solution in one week.”**

Russell Shirley, Hart EMC Manager of Technical Services

an option for this scenario, the team also published a custom Hart EMC basemap with only land layers turned on. Users are able to switch interactively between the custom basemap and the Esri basemaps.

### Collecting Inspections

GPS functionality is very important to Hart EMC, and the team was able to test it out on the iPads. The function adds a directional arrow to the map indicating where the user is heading. For example, when a user approaches a pole, inspection data can be added along with a photograph, and the inspection marked complete.

Once the inspection of an asset is completed, the symbology on the map changes to give visual feedback of areas that have been completed. This feature also allows people in the back office to watch inspection progress in real time via a web map or operations dashboard. As the user continues on an inspection path, the map turns from red to green, making it easy to visualize the completion details and even easier to pick up again the next day.

### Empower the Data

For Hart EMC, SSP created an SSP Nightly Batch Suite (NBS) application that

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would review the inspection data each night. It is configurable and allows the detection of any nonstandard inspection field values that indicate that maintenance needs to review and/or follow up on the asset records.

At Hart EMC, there are two individuals who wanted to get daily exception reports e-mailed to them. SSP's goal was to include only the records that needed attention and then to create a report that easily drew attention to the irregular values. SSP was able to generate a report that is e-mailed to a specific list, highlighting irregular fields in yellow on each record to make review quick and easy.

The team at SSP also called out the number of pictures that were attached to the record, added a column with a unique link for each asset to Hart EMC's internal ArcGIS for Server web app for

easy viewing, and added extra columns to allow tracking of resolution details. This report makes the data actionable in an effective, automated manner. It puts information into the right hands much more quickly than the previous paper process and provides a standardized approach for the collection and aggregation of this field data.

### Archive Completed Data

The third and final SSP Nightly Batch Suite application was intended to be run once a year at the end of the inspection cycle. It first converts all the completed inspection records from the ArcGIS Online WGS84 inspection classes into an archive feature class in the Stateplane Georgia system. It also moves any pictures or other attachments to keep them intact with the original inspection

record. After the completed data has been moved, the application cleans out any inspection data for that current target year.

This process will effectively archive and clean up the active inspection class, making it ready to accept the targeted inspections for the next inspection year.

### A New Spin on Inspections

Hart EMC's end-to-end solution took a new spin on ArcGIS Online inspections by using targeted inspection records in the field. The team members used back-office automation to create a configurable and repeatable inspection cycle, and they empowered the data by getting exceptions into the hands of the operations staff members who need it the most.

Visit [arcgis.com](http://arcgis.com).

## Map Shows Real-Time Wildfire Data with Transmission Facilities

### App Pushes Automatic Notifications to Emergency Staff

PacifiCorp GIS Solutions, the group responsible for maintaining transmission infrastructure data for Pacific Power and Rocky Mountain Power, recently used ArcGIS software to develop and automate a wildfire mapping and notification process. The maps show transmission facilities alongside near real-time wildfire data available from the National Aeronautics and Space Administration (NASA), the US Forest Service (USFS), and other government agencies. The automation saves considerable time, eliminating the process of manually converting, analyzing, and mapping fire data.

Pacific Power and Rocky Mountain Power maintain more than 16,200 miles of high-voltage transmission lines across 10 states in the western United States.

"Requests for wildfire maps in 2012 came from risk management staff," said Marshall Payne, GIS support services director, PacifiCorp. "While they were aware of wildfire general locations, there was no way for them to easily visualize transmission infrastructure in proximity to wildfires."

Payne and his team developed a script to convert available wildfire data and use it to identify and quantify threatened assets. The information, along with a PDF map, is then sent via e-mail to a distribution group that makes critical decisions. The script runs every four hours, pushing notifications to operations and risk management staff, keeping them informed of new fires and changes occurring with existing fires.

The wildfire notification solution has since been used to provide seismic

activity alerts. It is currently being considered for flood alerts based on available stream gauge data.

PacifiCorp also uses ArcGIS technology for spatial load forecasting, transmission corridor planning, solar and wind farm site selection, drive-time analysis, outage analysis, circuit mapping, natural resource management at generation facilities, environmental permitting, and real estate management.

"ArcGIS has helped us solve a number of complex problems, which ultimately benefits our customers," Payne said.

Visit [esri.com/transmission](http://esri.com/transmission).



# Randolph EMC Uses iOS App for Field Inspections

By Brandon Fyffe, GISbiz

Randolph Electric Membership Corporation (EMC) currently serves more than 31,000 members within a service area that covers 4,100 miles of line in Randolph, Moore, Montgomery, Chatham, and Alamance Counties in North Carolina. Randolph EMC recently contacted Esri partner GISbiz, a solutions and services provider in Nashville, Tennessee, for help with field inspection workflows. Operators at Randolph EMC wanted to move from the company's legacy process, which depended on paper documents, spreadsheets, e-mails, and telephone calls. They sought a new mobile system that automates the field inspection workflow from the reporting to the resolution of issues.

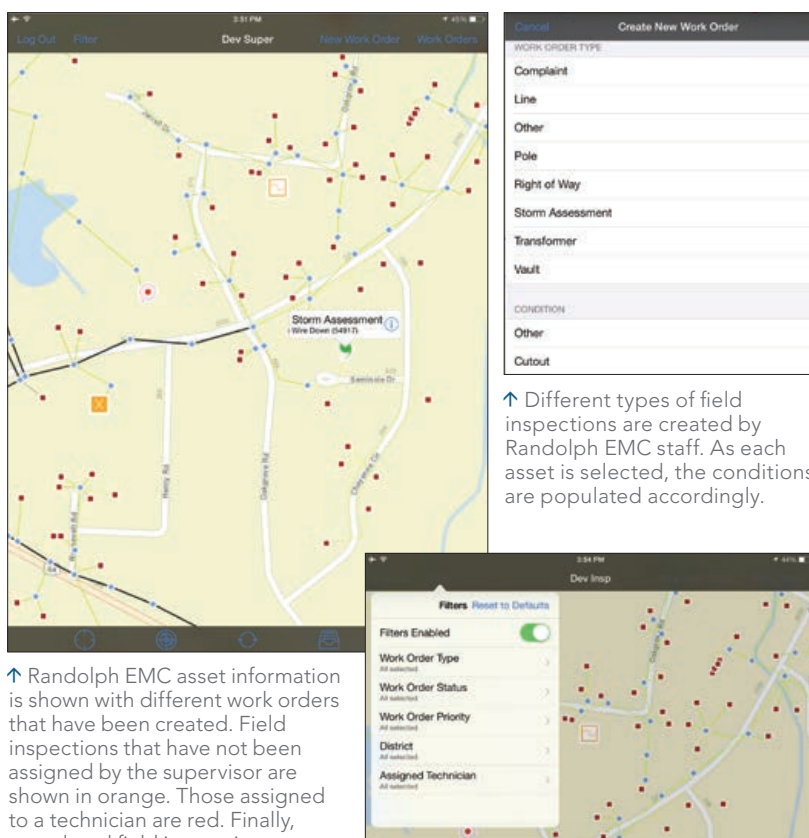
"Doing our Operations and Management Survey for Rural Utilities Service on paper records caused all sorts of issues we wanted to address," said Dennis Mabe, vice president of engineering and operations for Randolph EMC. "The main issue we were experiencing that this app resolved was that things would get called in or written on paper but wouldn't get fixed, or they would get fixed but there wasn't a record of it."

GISbiz implemented its geoOrganizer software to modernize field inspections for Randolph EMC. The solution consisted of a native iOS application that works on iPad, iPhone, and iPod touch along with a web-based dashboard application. This solution enabled Randolph EMC to keep track of inspection reports being created in the field and also to track which employee was creating, working on, or completing a field inspection throughout the Randolph EMC asset network. The solution leverages the latest capabilities of the Esri ArcGIS platform and iOS software developer kit (SDK).

The immediate benefit of having a native iOS application for Randolph EMC is the ability to work in disconnected mode. This means that work orders can be created without an Internet connection and can be synced to the database whenever users get an Internet connection.

"Having this app also helps us look up legacy information and re-create old problems and the resolution," said Mabe. "This is especially handy in training and resolving new problems based off old experiences."

The GIS-based solution has improved communication between field inspectors, supervisors, and technicians. The workflow starts with a field inspector who finds an asset in need of repair or maintenance. It could be anything from a broken pole to sagging power lines. The inspector can take notes and photos of what they are seeing and assign it a criticality level.



↑ Randolph EMC asset information is shown with different work orders that have been created. Field inspections that have not been assigned by the supervisor are shown in orange. Those assigned to a technician are red. Finally, completed field inspections are green. Each different kind of asset served gives each feature a different symbol on the map.

↑ Different types of field inspections are created by Randolph EMC staff. As each asset is selected, the conditions are populated accordingly.

↑ The filter feature allows users to filter through inspections by asset type, status, priority, district served, or assigned technician.

Because Randolph EMC's solution is an iOS app, all the documentation can be done with or without Internet connectivity. Once in range of Wi-Fi, the inspector simply hits a button to send the inspection report to the supervisor. The supervisor can review the photos and notes and assign a technician in the area to address the problem. The supervisor also has the option to complete the work order. Users are also able to get driving directions to any of the inspection report locations that are documented.

"Everyone sees the asset that needs [to be] fixed, and a line superintendent can notify a nearby crew to fix it," said Mabe. "It saves us a lot of time and money that was wasted trying to find things based on pole number and paper records. The implementation was very easy. Seventy percent of my linemen were already taking iPhones or iPads into the field, and they could use this app on those devices."

For more information on this implementation, please contact Dennis Mabe at [Dennis.Mabe@randolphemc.com](mailto:Dennis.Mabe@randolphemc.com) and/or Brandon Fyffe at [Brandon.Fyffe@gisbiz.com](mailto:Brandon.Fyffe@gisbiz.com).

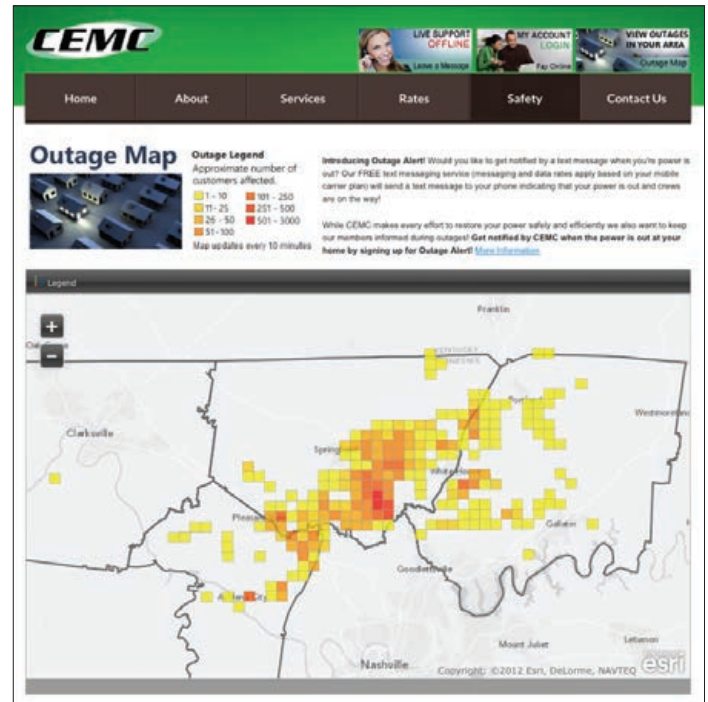
# Cumberland Electric Finds Success with ArcGIS Online

Cumberland Electric Membership Cooperative (CEMC) staff members considered publishing incident data from their Outage Management System (OMS) to a public information map portal using their on-premises ArcGIS for Server instance and a traditional Esri viewer template. Concerns about network security and server capacity for additional web traffic led them to consider other alternatives.

Rather than deploy an additional ArcGIS for Server instance for public access, CEMC opted to publish operational data on an ArcGIS Online organizational account. This approach proved to be a quick and effective strategy for providing the public with the appropriate level of information in a manner that was easy to find, use, and understand.

## Why Use ArcGIS Online for Outage Maps?

Using ArcGIS Online for outage maps, utilities are able to eliminate firewall security concerns, overcome Internet bandwidth or server scalability issues, quickly deploy professional interactive maps with minimal effort, and embed maps directly into the company website.



↑ CEMC publishes operational data through ArcGIS Online.

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(Some assembly required.)

Creating your own map from maps published by other users is just one of many ways to take advantage of the rich collection of data and resources ArcGIS<sup>SM</sup> Online makes available to you.

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# Schneider Electric's Geospatial Services for Esri Users

Many utilities have invested heavily in GIS. Until now these systems were used by a fraction of company employees, but utilities today need to leverage their existing systems and make geospatial information available to other departments.

ArcFM is an Enterprise GIS based on Esri's ArcGIS with reliable network intelligence that provides information such as the number of customers attached to a gas meter, and what devices are downstream of a particular fuse. While this information has been vital to mapping

services or asset management groups, it can also be useful in other areas of the company. The challenge is to leverage that network intelligence across your organization without the cost and complexity of heavy desktop deployments. Schneider Electric's Geospatial Services is that vital link between your desktop GIS and flexible, lightweight applications for any aspect of your business.

With the new Orbit solution crews can quickly gather information in the field, at specific locations, and collaborate on

field-oriented projects. Orbit leverages Geospatial Services from both ArcFM and Orbit Data Services to provide work information and mapping functionality, as well as manage the data captured during work.



## Solar Power for the German Grid

continued from cover

take the additional load?), registration in SAP as a potential feed-in contract point, and an approval letter from LEW.

The first check of the network calculation was initially done based on spreadsheets. Since it is actually not a complicated mathematical equation, this check can be done easily with Excel. However, the network parameters (diameter of cables, cable types, cable lengths, etc.) have to be entered into the equation, resulting in extensive entry work into Excel. This would be fine if the company

had only one or two applicants per month. However, given the characteristics of its distribution area and the huge number of new applicants, LEW GIS manager Martin Thoma saw a need for improvement.

Thoma knew that all the information for the calculation is actually contained in the GIS. With the help of some IT consultants, he created a method to do the network calculation directly on the database level. Thoma was able to design a web-based network information system, where LEW evaluation engineers can simply click a given service point, convert it into a feed-in point, and have the server in the background calculate whether the network can take the new feed-in load. Of course, switch positions—either simulated or real—are taken into account.

Between the application and the actual final installment of the solar panels, there is a certain time interval. During this time, the potential feed-in point is saved in the web-based system to account for its network impact during all future calculations in this part of the network. Thus, it was possible to reduce the technical evaluation of a new application from half an hour using Excel to a few minutes using the new web-based method. With

roughly 10,000 applications per year, this equates to about 520 days' work reduction. The solution has also greatly improved customer service and given the company better calculation possibilities such as the ability to find alternative routes quickly and take into account planned feed-in points.

"Already now, we have 60,000 photovoltaic generation plants at the grid level," said Thoma. "We believe that our current strategy to provide very simple, web-based apps and services to the operational departments of LEW is the right way. Thus, we really embrace the business processes with these web-based services and improve them with integration of GIS data and functions."

Thoma said visibility of GIS capabilities has greatly increased at LEW and everyone is now helping to maintain excellent data quality. Thoma's next plan is to integrate SAP directly into this web-based system so that the registration of the applicant in SAP (currently a paper-based process) will happen directly on the digital level. When selecting the service point in SAP, the client would be looked up directly.

**"Already now, we have 60,000 photovoltaic generation plants at the grid level. We believe that our current strategy to provide very simple, web-based apps and services to the operational departments of LEW is the right way."**

Martin Thoma, LEW GIS Manager

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