Sustainable design

How can utilities address global sustainability? *Power & Energy* spoke to Autodesk's **Alan Saunders** to find out more.

Sustainability initiatives, such as intelligent grid projects, AMI and demand response programs, are on the rise in the utilities industry. In fact, the local utility represents the epicenter of the sustainable energy movement. To support the myriad of sustainability initiatives, local utilities need access to complete, accurate, and integrated network information that can fuel better design decisions, guide more efficient maintenance and operations, and support improved customer service.

It begins with good asset design; moving beyond designs that minimize initial construction costs, utilities must account for environmental, social, and economic factors, including energy efficiencies. By considering historical outage and efficiency rates, maintenance schedules, and expected length of life in the design process, utilities can use integrated design software to create more sustainable designs while ensuring asset longevity.

Model-driven design software can also improve sustainability during the design process. Many utilities work closely with developers of new and retrofit buildings to ensure energy-efficient design. Developers who use building information-modeling to simulate a building before construction can optimize naturally lighted floor space, increase green space, minimize impermeable surfaces, and eliminate heat islands. Utilities can use integrated design software to reduce waste during the construction of their own network facilities and can eliminate waste by ordering only necessary materials and equipment – a possibility for those who use software that automatically creates precise bills of material from designs.

After a utility builds the asset or infrastructure, sustainability efforts shift to maximizing maintenance and operational efficiency; requiring the utility to have an accurate picture of all network assets. With centralized design, asset, and spatial information, the utility can easily manage data on a specific asset's age, location, condition and relationship to other assets. When a repair ticket is issued for an underground line, the service technician can then quickly identify and replacement parts required to fix the problem, rather than wasting time making multiple trips to diagnose and correct the issue. Further, the utility can effectively coordinate with other local agencies that manage roads, water, sewerage, or telecommunications to minimize the combined environmental impact from maintenance.

Internally, a utility can reduce its maintenance fleet's fuel consumption by improving the way it handles routine field operations such as vegetation management; by modeling and visualizing trees in the utilities' service area, field crews can pinpoint where tree trimming is required, rather than driving routes in search of problem vegetation.

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Design sustainability also applies to substation and plant rehabilitation – traditionally a laborious and expensive process. Leading utilities are turning to 3D design tools to dramatically reduce the costs of design work. With accurate models in place, utilities can produce contextual visualizations of the planned substation and develop a footprint with minimal environmental impact.

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Increasingly, consumers are concerned about sustainable energy use, adding smart devices on appliances and installing rooftop solar panels. Consumers want to better control their usage – requiring timely data on peak loads and rates. To support these requests, utilities need access to accurate, as-built data so they can provide consumers with pertinent environmental and usage information and deliver customer services related to sustainability more efficiently. German utility UEZ Lülsfeld was faced with the challenge of managing a growing number of private solar and wind generators in their service area. 'Thanks to Autodesk, we've got the data we need to quickly approve new solar hook-ups all in one system,' says Artur Brei, their GIS and Documentation Manager. 'What used to take between several days to two weeks, can now be accomplished for our customers in a few hours.'

The ability to manage every aspect of the asset life cycle plays a role in going green. Utilities that adopt integrated design, spatial, and asset management solutions and have complete and accurate network information are better prepared to support sustainable facilities and operations – and to help consumers use energy wisely. ■