


The Grid in Transformation

11th Annual Electric Power Industry Conference

University of Pittsburgh
Swanson School of Engineering

Rich Riazzi
President and CEO
Duquesne Light Company
November 14, 2016



 Play Backward/Forward Video

Current State of Industry in Pennsylvania

- Market and industry are changing, regulatory and legislative models need to evolve
- Increasing stakeholder support for next generation energy solutions
- Sustainability efforts and regulations continue to reduce throughput
- Must keep rates affordable, particularly for low income

Industry Disruption Is Occurring



Including Our Own



Hawaii – solar & distributed generation

San Diego Gas & Electric – solar

New York – Reforming the Energy Vision (REV)

State of Nevada PUC

Portland General Electric – microgrid technology



Our Transformation



From an old-fashioned light company...



To a dynamic “LIFE” company...



Evolving our...

- Message to what we enable in our customers' lives.
- Efforts to become a next generation energy company through infrastructure, technology, talent and innovation.

DLC Vision and Mission

Vision

To unleash the boundless potential of the grid, creating a dynamic and sustainable future for our community.

Mission

We are larger than light. Always on, we safely power – and empower – our customers' lives while relentlessly innovating to energize the future.

A History of Innovation

Late 1880s

Helped prove that alternating current was superior to direct current, enabling electricity to become commercially viable

1912

Emerged from 150 competitors to become the area's primary electric company

1920s

Created the first high-voltage transmission ring to surround a major city

1957

Built and operated the U.S.'s first commercial nuclear power plant

1970

Pioneered the use of environmental protection at our coal-fired power stations

Late 1970s

One of the first utilities to implement distribution automation

2000

First Pennsylvania utility to sell generation business and become a "wires company"

Building a Next Generation Energy Company

Our Strategic Approach

Modernize
the Grid



\$2.6B

In infrastructure and technology
investments from 2010 to 2020

Build the
Team

700

Employees hired in
last 3 years



"Life Behind the Lines"

Invest in the
Future



Transportation
Electrification



Microgrids



Battery Storage

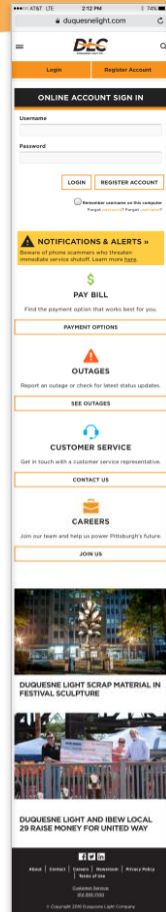
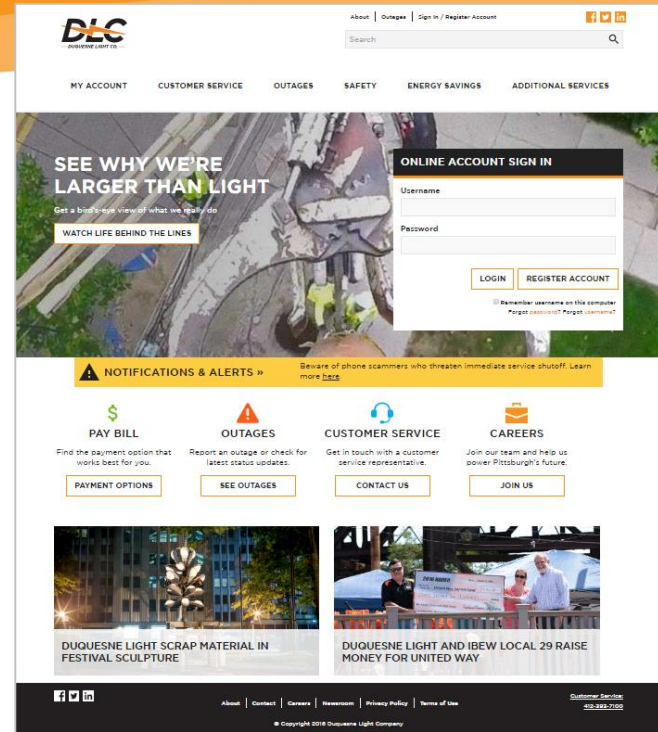


Solar

Modernize the Grid

Our Strategic Approach

- Investing \$2.6 billion to ensure grid reliability, resiliency, safety and affordability
- Enhance the customer experience
- Ensure rate constructs align with our cost structure, ensuring recovery
- Minimize cross-subsidization



Build the Team

Our Strategic Approach

- Maintain and transfer core skill sets, and prepare for future needs
- Rebrand to change customer perceptions and attract/retain top talent
 - 14 out of 35 2016 DLC interns Pitt students
 - 9 out of 14 Pitt interns in Swanson School



LIFE BEHIND THE LINES

Ride shotgun as we drive a utility pole through city traffic. Step inside an off-limits sub station. Venture beneath the city streets to power up the skyline. This web series gives you an all-access pass to see the things we do every day to power moments in our customers' lives.

EPISODE 2- ENGINEERS

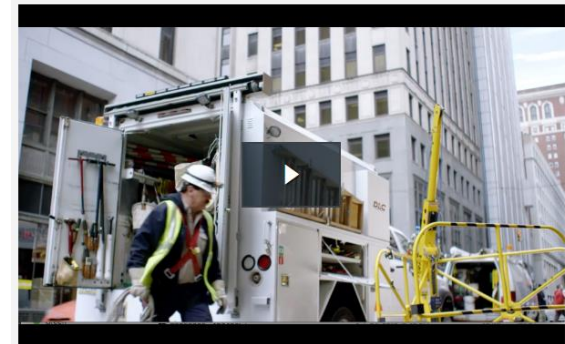
Delivering electricity takes more than concrete and steel. It takes brainpower. And while delivering life-as-we-know-it to millions of Pittsburghers isn't exactly written into our Engineers' job description, it's a big part of Life Behind the Lines.




TV SPOTS

These TV commercials show that we're working to power more than just your lights.

FOOTBALL

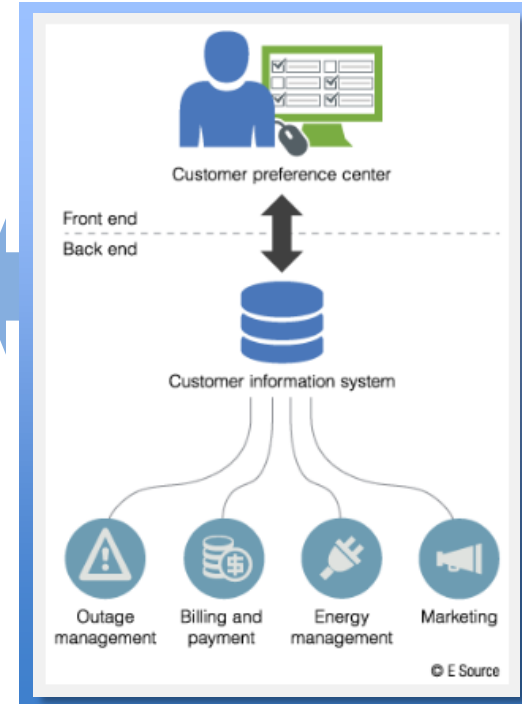


 Play Engineering Video

Invest in the Future

Our Strategic Approach

- Deploy new technologies
- Transform the way we engage with our customer
- Evolve rate structures and regulatory constructs
- Form partnerships and execute pilot projects



Partnerships are Critical to Success

- Collaboration among industry, education, foundations and government key to transforming our region
- Opportunity to be a model and place of demonstration for the country
 - University of Pittsburgh
 - Energy Grid Research and Infrastructure Development Institute at the EIC
 - Microgrid at Woods Run Campus
 - City of Pittsburgh
 - Department of Energy
 - National Energy Technology Laboratory
 - Pitt-Ohio and Eaton
 - Heinz Endowments, Hillman Family Foundations, and R.K. Mellon Foundation



PITT | **SWANSON**
ENGINEERING

One Year Ago

November 16, 2015



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For Release Upon Receipt
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Duquesne Light and University of Pittsburgh's Swanson School of Engineering Partner to Advance the Electric Power Industry
Program includes financial and physical resources to build an urban microgrid

PITTSBURGH – Today, Duquesne Light and the University of Pittsburgh's (Pitt) Swanson School of Engineering announced their intent to partner to help redefine the future of the energy landscape in the region. This strategic partnership will include projects designed to provide Duquesne Light with critical knowledge to help inform future grid design and potential new product and service offerings, while helping to enable expanded research opportunities for students and faculty in the University's energy and electric power programs.

The partnership is one of the first steps in Duquesne Light's long-term strategy to reinforce its leadership in grid infrastructure, sustainability and management, while also furthering its interest in new technologies that will be key to evolving the grid into a dynamic network that enables reliable, seamless two-way flow of power. Details of the partnership include:

- Design and installation of an urban microgrid at Duquesne Light's Woods Run Facility located in Pittsburgh's North Shore. With support from the Swanson School's Electric Power Systems Laboratory and its Electric Power Program, the installation will serve as a real-world laboratory to research microgrid resiliency and the integration of distributed and renewable energy resources into the electric power distribution grid, as well as other key enabling technology areas such as power electronics controllers, direct current (DC) infrastructure, energy storage systems, and smart grid technologies.
- Duquesne Light will make a \$500,000, multi-year financial contribution to help fund electric power research, energy efficiency, laboratory facilities, and equipment at Pitt, in addition to providing the necessary expertise to interconnect any new electric power laboratory facilities to the existing electric power grid.

"Partnering with one of the most prestigious universities in the region and a leader in electric power research will accelerate the advancement of new technologies and enable the transformation of our grid," said Rich Riazzi, CEO of Duquesne Light. "Pitt brings unrivaled technical expertise and value to this partnership which, combined with Duquesne Light's 135 years of transmission and distribution experience, will help us develop the next chapter of electric power in our region."

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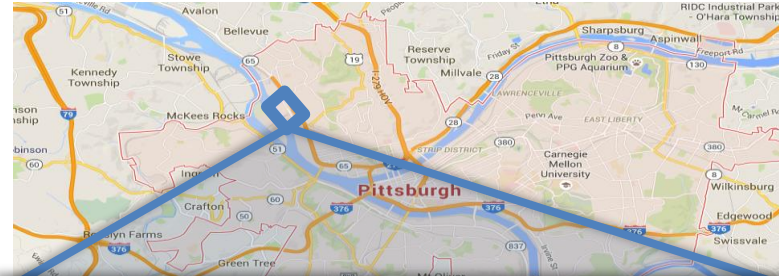
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Woods Run Microgrid


Project Update

- Goals:
 - Increase the resiliency of critical infrastructure
 - Research microgrid operations and the interconnection of DER with micro- and macrogrids
- Solar, wind, battery and natural gas will be components
- DLC and Pitt collaborated to finalize project scope; next step is design and engineering
- Construction to occur in 2017 and 2018



Closing Thoughts

- The industry is rapidly changing, creating exciting opportunities and difficult challenges
- We must work together to leverage the opportunities and overcome the challenges
- Exhilarating time to be in the electric sector and a part of this great city's transformation

A night-time photograph of a city skyline, likely Pittsburgh, with a worker on a utility bucket in the foreground. The worker is wearing a yellow jacket and a hard hat, and is positioned on a bucket that is part of a crane or lift. The worker is looking towards the right side of the frame. The background shows several tall buildings, with one prominent building in the center having a distinctive green roof. The sky is dark, and the city lights are visible. The overall scene is illuminated by the city lights and the worker's headlamp. The image is framed by orange bars at the top and bottom.

DLC

— *DUQUESNE LIGHT CO.* —