

District Energy Panel Session

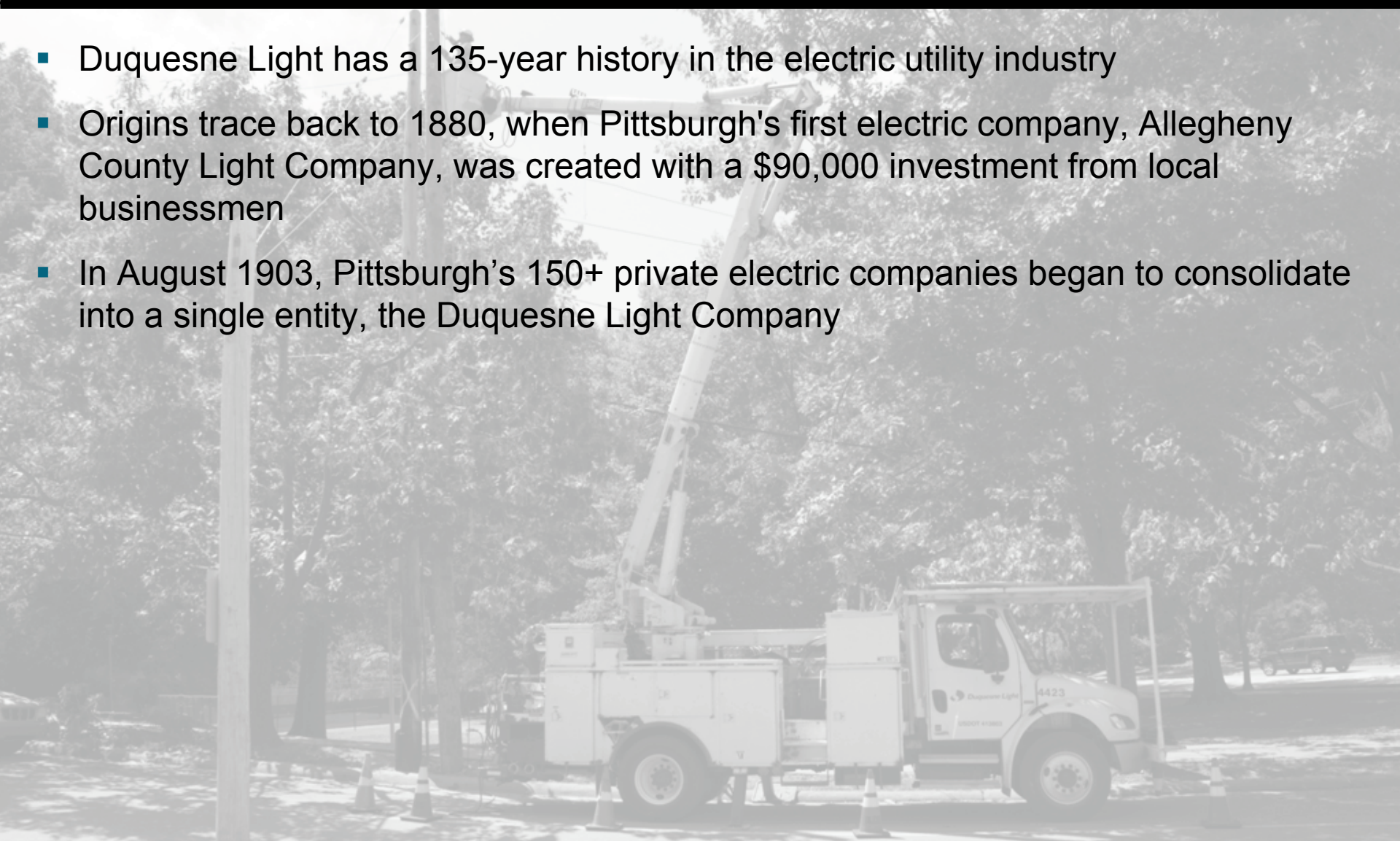
Ben Morris

Senior Manager, Strategic Planning & Operational Analytics

Duquesne Light Company

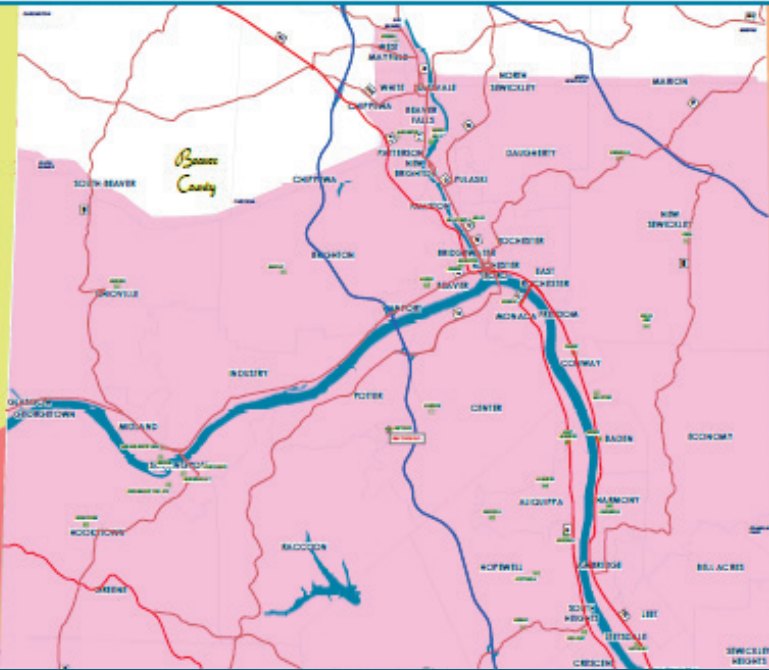
Who We Are

- Duquesne Light has a 135-year history in the electric utility industry
- Origins trace back to 1880, when Pittsburgh's first electric company, Allegheny County Light Company, was created with a \$90,000 investment from local businessmen
- In August 1903, Pittsburgh's 150+ private electric companies began to consolidate into a single entity, the Duquesne Light Company

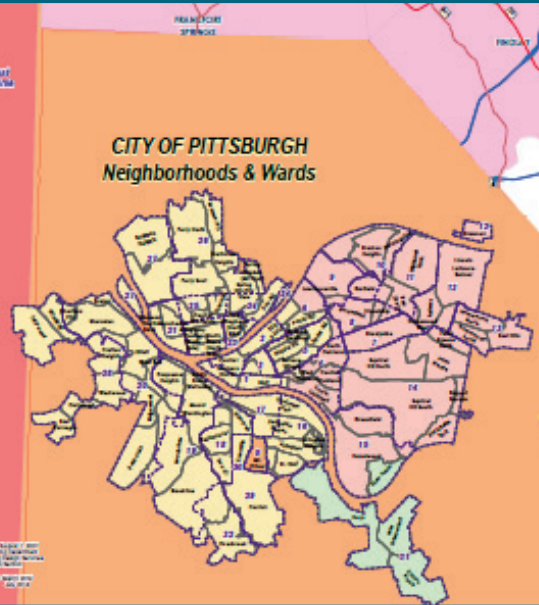




SERVICE CENTER TERRITORIES



Today, Duquesne Light serves 590,000 customers in metropolitan Pittsburgh and the surrounding area, a service territory of 800 square miles



History of Innovation

Late-1880s

Helped prove that alternating current was superior to direct current for T&D, enabling electricity to become commercially viable

1910s

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

1910s

Developed the first effective lightning arrestors, invented to protect high-voltage lines

1950s

Built and operated the U.S.'s first commercial nuclear power plant (Shippingport Atomic Power Station)

1970s

Pioneered the use of environmental protection (sulphur dioxide "scrubbers") at our coal-fired power plants

Late-1970s

One of the first utilities to implement distribution automation

2000

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

2010s

Investing \$2.6 billion in infrastructure and technology upgrades to continue providing our customers with safe, reliable power

Modern Technology

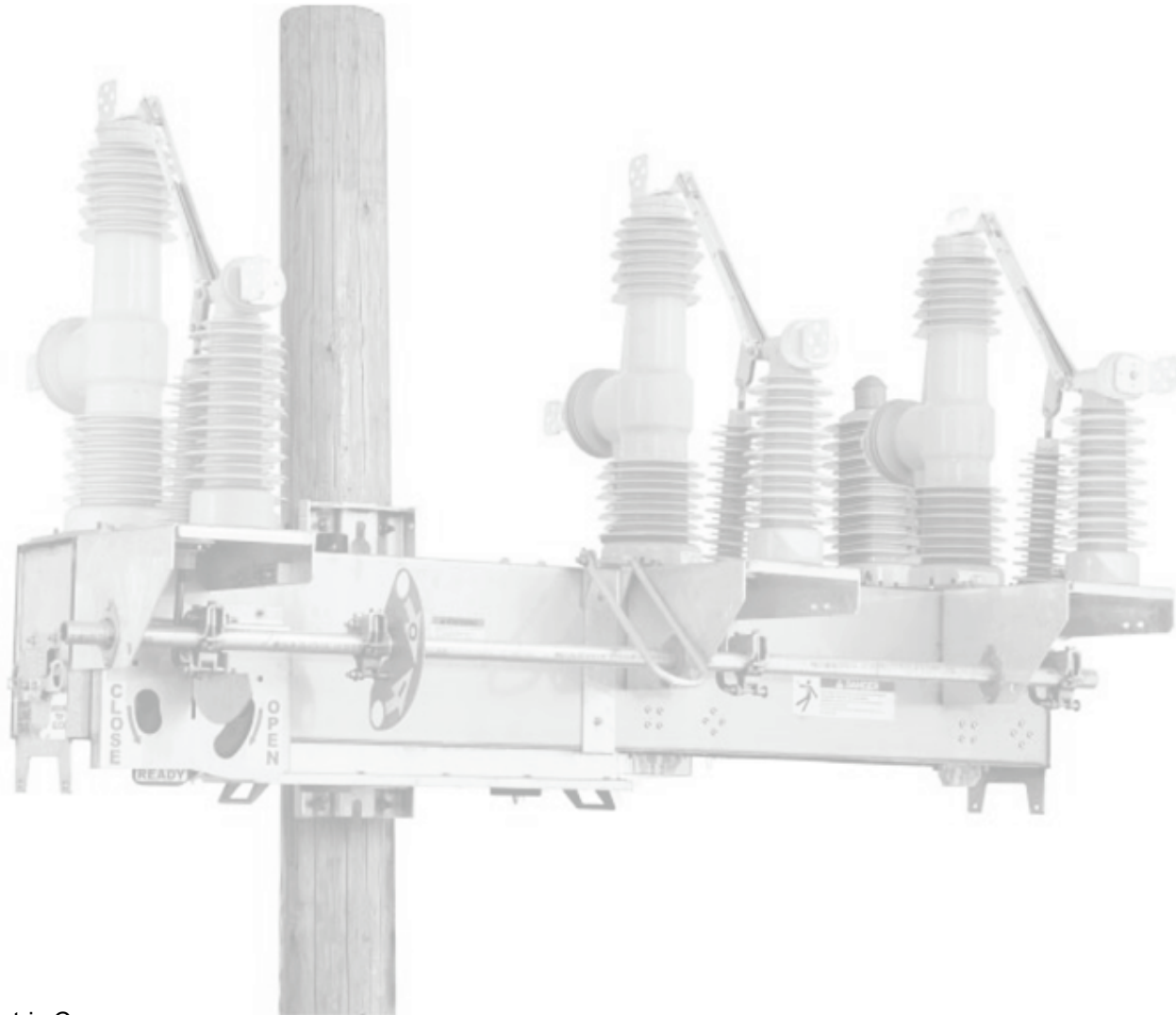
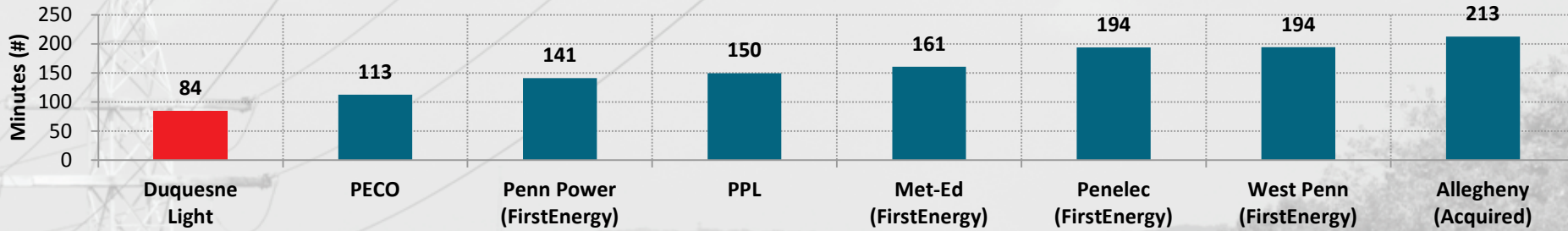


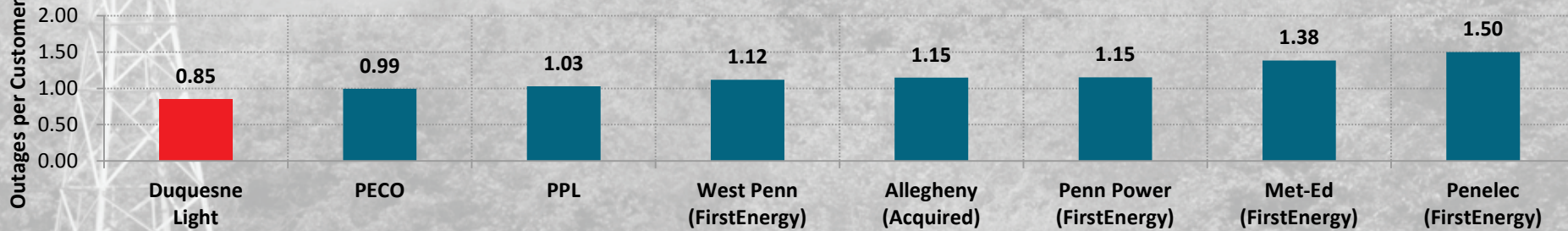
Photo Credit: S&C Electric Company

Superior Reliability

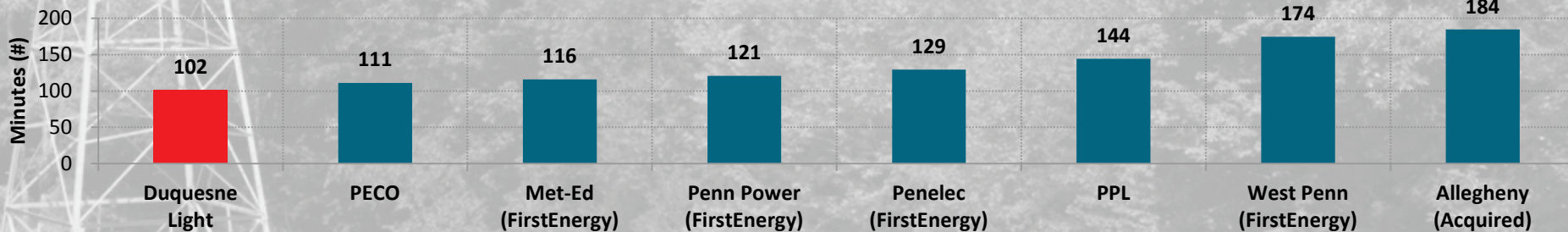
System Average Interruption Duration Index ("SAIDI") ['05-'14 10-Yr. Avg.]



System Average Interruption Frequency Index ("SAIFI") ['05-'14 10-Yr. Avg.]



Customer Average Interruption Duration Index ("CAIDI") ['05-'14 10-Yr. Avg.]



New Frontiers—A Microgrid Pilot

- Duquesne Light already has the best reliability in Pennsylvania, providing Pittsburgh with safe, reliable power under almost all circumstances
- However, the threat of “black swan” weather events and potential targeting of U.S. infrastructure assets has caused community leaders nationwide to undertake disaster recovery planning
- In the electric utility industry, microgrids are regarded as a means by which to provide power to critical social infrastructure assets (e.g. hospitals)
- As a socially responsible member of the greater Pittsburgh community, Duquesne Light—in partnership with Pitt and other community stakeholders—will be building a microgrid to service our own operations facilities on Pittsburgh’s North Shore
- Our “Woods Run” pilot is intended to serve as a real-world laboratory to research microgrids and the integration of distributed and renewable energy resources into the electric power distribution grid
- Will also serve other key enabling technology areas such as power electronics controllers, direct current (DC) infrastructure, energy storage systems, and smart grid technologies

Woods Run Microgrid Pilot Project



Photo Credit: Google Maps

Woods Run Microgrid Pilot Project



Photo Credit: Google Maps

- **Balancing the Cost of Offsetting Risk**
 - Utilities are obligated to provide safe, reliable, affordable service to their customers, but what is the right balance?
 - At what point does customer affordability outweigh preparations against “black swan” risk?
- **Socializing the Cost of Community Goods**
 - For microgrids designed to “island” social infrastructure assets (e.g. hospitals), how should the associated costs be socialized?
 - Are these community goods for which all customers should pay?
- **Ownership and Control of Distributed Generation Assets**
 - An Electric Distribution Company (EDC) is responsible for power quality and balancing of its local grid, which may require control of dispatching distributed generation assets. How should this control be effected, and should deregulated EDCs be permitted to own distributed generation assets?

Thank You!



Photo Credit: Pam Panchak, *Pittsburgh Post-Gazette*