Assessing Your Long-Term Competitiveness
Agenda

- Significant changes in the energy industry
- Creating a roadmap
  - Retail customer survey
  - Utility Assessment
- Case Study #1
- Case Study #2
- Summary and discussion
Agenda

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Enabling Technologies

- Emergence of 5G communications
- Artificial Intelligence (AI) and machine learning
- Emergence of the Internet of Things (IoT)
- Autonomous vehicles (autos and drones)
- Evolving data analytics capabilities
  - Integration across AI, IoT, customers, and grid
- Declining renewable and storage costs
  - Batteries
  - Solar
Strategic Workforce Focus

Players on the bench – Do you have the right mix?

- The Energy industry is evolving at a rapid pace creating both traditional and new skill requirements
- Effective, cross-functional workforce planning tied to an organization’s strategic plan will be critical to ensure the right mix of skills

Upskill, buy, outsource, or partner?

- Organizations will be challenged to rethink attraction and retention practices to quickly address changing needs
- Flexible development programs will be required to upskill current resources

“Strategic business decisions may have profound changes on a company’s workforce size, demographic makeup, skill sets, and knowledge requirements.”

- Center for Energy Workforce Development, 2018 Game Changers National Strategic Workforce Plan
Customer Expectations

We are now in the “age of the customer”

• Amazon singlehandedly raised the bar on customer expectations
• Increased demand for instant gratification and personalization
• Innovation transforms into expectation

(Source: Forrester Research, Inc.)
Infrastructure Modernization

Infrastructure modernization is needed as the energy industry moves from the one-way power flow model to a model focused on the distribution system.
Non-Traditional Competition

- Retail competition is happening in an unexpected manner
- New competitors are generally not the usual players
- Market opportunity of $1.3 trillion
- Technology and non-utility experiences are shaping customer expectations
- Customer choice and control

<table>
<thead>
<tr>
<th>COMPANY</th>
<th>CORE BUSINESS</th>
<th>WHAT IS THE THREAT?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amazon</td>
<td>Tech</td>
<td>Retail customers purchase energy directly from retail giants</td>
</tr>
<tr>
<td>Google</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apple</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T-Mobile</td>
<td>Telecom</td>
<td>Telecom providers utilize utility data to provide energy products to retail customers</td>
</tr>
<tr>
<td>Verizon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>Oil &amp; Gas</td>
<td>Fossil fuel companies provide onsite charging services off of the electric grid</td>
</tr>
<tr>
<td>BP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shell</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sonnen</td>
<td>DER</td>
<td>DERs continue to get market share and the technology matures to allow cutting ties with the grid</td>
</tr>
<tr>
<td>SolarCity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tesla</td>
<td>Auto</td>
<td>Automobiles mature to the point of being grid resources, giving automakers a market opportunity</td>
</tr>
<tr>
<td>Toyota</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mercedes-Benz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy Retail</td>
<td></td>
<td>Retail players continue to find ways to circumvent regulated retail markets</td>
</tr>
</tbody>
</table>
Three Areas of Focus

- Technology
- Competition
- Customer
Agenda

• Significant changes in the energy industry
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Creating a Roadmap

- Utility Assessment
- Energy Industry Trends
- Retail Customer Survey

ROADMAP
Retail Customer Survey

2017-2019 Survey Participants

Apex
Ayden
Belhaven
Benson
Cherryville
Clayton
Cornelius
Edenton
Elizabeth City
Farmville
Fayetteville PWC
Gastonia
Huntersville
Lexington
Lincolnton
Louisburg
- Lumberton
- Maiden
- Morganton
- New Bern
- New River Light & Power
- Newton
- Pineville
- Rocky Mount
- Shelby
- Smithfield
- Tarboro
- Wake Forest
- Washington
- Winterville
Customer Survey: Market Segments

**Status Quo**
Not engaged, middle-aged, middle-income, families, focused elsewhere, satisfied

**Technology Cautious**
Older and traditional, established, middle-income, very satisfied

**Savings Seekers**
Lower income, engaged with utility, focused on lower costs, not satisfied

**Movers and Shakers**
Upper income, educated, engaged, tinkerers, not satisfied

**Green Champions**
Younger, mid to upper income, engaged, focused on environment, moderately satisfied
Customer Survey: Market Segments

NC PUBLIC POWER
- 35.2% - Status Quo
- 16.1% - Technology Cautious
- 11.2% - Savings Seekers
- 12.0% - Movers and Shakers
- 25.4% - Green Champions

IOU
- 39.1% - Status Quo
- 19.8% - Technology Cautious
- 10.3% - Savings Seekers
- 14.1% - Movers and Shakers
- 16.7% - Green Champions

CO-OP
- 50.0% - Status Quo
- 24.5% - Technology Cautious
- 7.5% - Savings Seekers
- 6.6% - Movers and Shakers
- 11.3% - Green Champions
## Retail Customer Survey Results

<table>
<thead>
<tr>
<th></th>
<th>NC Public Power Residential*</th>
<th>IOU Residential*</th>
<th>Rural Electric Coop Residential*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Communicating</strong> with customers</td>
<td>79.2</td>
<td>77.7</td>
<td>84.9</td>
</tr>
<tr>
<td>Providing services and products I expect of a modern utility</td>
<td>84.4</td>
<td>83.4</td>
<td>89.4</td>
</tr>
<tr>
<td><strong>Reliable</strong> electric service</td>
<td>91.6</td>
<td>90.5</td>
<td>92.8</td>
</tr>
<tr>
<td>Providing good value for the cost of electricity</td>
<td>66.3</td>
<td>65.2</td>
<td>74.3</td>
</tr>
<tr>
<td>Responsible steward of the environment</td>
<td>84.0</td>
<td>64.0</td>
<td>85.0</td>
</tr>
<tr>
<td><strong>Responding promptly</strong> to questions and complaints</td>
<td>84.4</td>
<td>79.2</td>
<td>85.3</td>
</tr>
<tr>
<td>Helpful and knowledgeable staff</td>
<td>86.9</td>
<td>82.3</td>
<td>90.0</td>
</tr>
<tr>
<td>Being supportive of community activities and events</td>
<td>89.5</td>
<td>82.5</td>
<td>90.2</td>
</tr>
<tr>
<td><strong>Overall satisfaction</strong></td>
<td>83.3</td>
<td>83.4</td>
<td>88.2</td>
</tr>
</tbody>
</table>
Utility Assessment

40 members responded in 2018 (45%)

**Topics Covered:**
- Strategic Planning
- Finance & Capital Spending
- System Losses
- Outsourcing
- Customer Engagement
- Value of Public Power
- Reliability
- Technology
  - 26% of members have AMI
- Security
- System Maintenance
- Safety
  - Members average 1.38 reportable safety incidents per 200,000 hours worked

SAIDI = System Average Interruption Duration Index (measured in minutes/customer/year)
SAIFI = System Average Interruption Frequency Index (measured in number of outages/customer/year)
ROADMAP – Key Questions

• How do I know where I am NOW?
  • Retail Customer Survey
  • Utility Assessment

• How do I know where I SHOULD be?
  • Retail Customer Survey (every 3 years)
  • Utility Assessment
  • Monitoring traditional competitors, as well as non-traditional competitors (e.g., Google)

• Checklist for Success
  - Independent assessment of prerequisite staffing needs/requirements
  - Links back to customer expectations and/or competition (existing or potential)
  - Understanding of costs and willingness to pay
  - Realistic schedule of expectations
ROADMAP

GROUP A  
Status Quo / Tech Cautious

CUSTOMER EXPECTATIONS:
- Low Cost
- Reliable

UTILITY CAPABILITIES:
- Reliable Power (SAIDI)
- Low Cost (Comparison)
- Staff 1.0
- Requisite Skillsets
- Adequate Procedures
- Cost of Service
- Some Form Of Software (Billing/Financial)
- Meters (Manual/Drive By)
- Long-term Planning (O&M/Capex)
- Communications w/Customer (Web/Text/Email)

1 YR (if not yet in Group A)

GROUP B  
Savings Seeker / Movers & Shakers

CUSTOMER EXPECTATIONS:
- Group A +
- Convenience
- Savings Opportunities

UTILITY CAPABILITIES:
- Group A +
- Load Management
- Modern Billing System
- Automated Meter Read or better
- Online Bill Pay
- Staff 2.0
- Strategic Plan
- High Speed Data

2 YRS

GROUP C  
Movers & Shakers / Green Champion

CUSTOMER EXPECTATIONS:
- Groups A + B +
- Distributed Energy Resource (Solar, Battery, Distributed Generation)
- Electric Vehicle
- Outage Notification (Personalized)
- Sustainability
- Thermostat Overload Switch
- Prepay
- Apps

UTILITY CAPABILITIES:
- Groups A + B +
- Advanced Meter Infrastructure
- Staff 3.0
- Tech Road Map
- Outage Management System
- Time Of Use
- Data Analytics

3 YRS

GROUP D  
Movers & Shakers / Green Champion

CUSTOMER EXPECTATIONS:
- Groups A + B + C +
- Automation Control
- Choice of Supply
- Smart Building
- Energy Cloud

UTILITY CAPABILITIES:
- Groups A + B + C +
- Data Analytics
- Smart City - Integration
- Out Of The Utility

5 YRS

15+ YRS

TIMEFRAME TO MEET EXPECTATIONS
Agenda

• Significant changes in the energy industry
• Creating a roadmap
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• Case Study #1
• Case Study #2
• Summary and discussion
Case Study #1

Customer Survey Results

Residential Segmentation Comparison

<table>
<thead>
<tr>
<th>Status Quo</th>
<th>Technology Cautious</th>
<th>Savings Seekers</th>
<th>Movers and Shakers</th>
<th>Green Champions</th>
</tr>
</thead>
<tbody>
<tr>
<td>36.6%</td>
<td>36.2%</td>
<td>27.5%</td>
<td>17.1%</td>
<td>18.4%</td>
</tr>
<tr>
<td>18.9%</td>
<td>14.2%</td>
<td>13.2%</td>
<td>7.9%</td>
<td>14.3%</td>
</tr>
<tr>
<td>14.3%</td>
<td>17.6%</td>
<td>15.6%</td>
<td>17.9%</td>
<td>14.6%</td>
</tr>
<tr>
<td>89.5%</td>
<td>83.0%</td>
<td>77.0%</td>
<td>82.1%</td>
<td>87.9%</td>
</tr>
</tbody>
</table>

- **Communicating** with customers
- **Reliable** electric service
- **Providing good value** for the cost of electricity
- **Responsible steward of the environment**
- **Responding promptly** to questions and complaints
- **Helpful and knowledgeable** staff
- **Overall satisfaction**

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<th>Town #1 Residential</th>
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</thead>
<tbody>
<tr>
<td>77.1</td>
<td>77.9</td>
<td>77.4</td>
<td>82.1</td>
</tr>
<tr>
<td>93.1</td>
<td>91.0</td>
<td>91.1</td>
<td>92.9</td>
</tr>
<tr>
<td>82.6</td>
<td>64.4</td>
<td>64.3</td>
<td>68.7</td>
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<td><strong>85.3</strong></td>
</tr>
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</table>

*NC Public Power and competitor scores based off of 2017 and 2018 survey results
Utility Assessment for Case Study #1

- **SAIDI:** 65 minutes/year
- **Cost:** Lower than all traditional competitors
- **Staff:** Appropriate capabilities on staff or through contracts
- **Procedures:** Missing security and emergency response procedures
- **Cost of Service:** Performed recently
- **Billing System:** Advanced Meter Infrastructure-capable billing system in place
- **Customer communication plan:** Plan in place
- **Meters:** Automated Meter Read
- **Online bill pay:** In place
- **Access to high speed data:** Yes
- **Long-term Planning:** Long-term capital plan in place (investment criteria)
- **Strategic Plan:** Not in place
- **Tech Roadmap:** Not in place
- **Outage management system:** Not in place
- **Time of use rates:** Not offered
- **Analytics:** Not in place
- **Smart city:** No smart city capabilities
## Example #1

### Group A
#### Status Quo / Tech Cautious

**Customer Expectations:**
- Low Cost
- Reliable

**Utility Capabilities:**
- Reliable Power (SAIDI)
- Low Cost (Comparison)
- Staff 1.0
- Requisite Skillsets
- Adequate Procedures
- Cost of Service
- Some Form Of Software (Billing/Financial)
- Meters (Manual/Drive By)
- Long-term Planning (O&M/Capex)
- Communications w/Customer (Web/Text/Email)

### Group B
#### Savings Seeker / Movers & Shakers

**Customer Expectations:**
- Group A +
- Convenience
- Savings Opportunities

**Utility Capabilities:**
- Group A +
- Load Management
- Modern Billing System
- Automated Meter Read or better
- Online Bill Pay
- Staff 2.0
- Strategic Plan
- High Speed Data

### Group C
#### Movers & Shakers / Green Champion

**Customer Expectations:**
- Groups A + B +
- Distributed Energy Resource (Solar, Battery, Distributed Generation)
- Electric Vehicle
- Outage Notification (Personalized)
- Sustainability
- Thermostat Overload Switch
- Prepay
- Apps

**Utility Capabilities:**
- Groups A + B +
- Advanced Meter Infrastructure
- Staff 3.0
- Tech Road Map
- Outage Management System
- Time Of Use
- Data Analytics

### Group D
#### Movers & Shakers / Green Champion

**Customer Expectations:**
- Groups A + B + C +
- Automation Control
- Choice of Supply
- Smart Building
- Energy Cloud

**Utility Capabilities:**
- Groups A + B + C +
- Data Analytics
- Smart City - Integration
  - Out Of The Utility

### Timeframe to Meet Expectations
- 1 YR (if not yet in Group A)
- 2 YRS
- 3 YRS
- 5 YRS
- 15+ YRS
Case Study #1: Recommendations

• Suggested immediate actions:
  • Address procedure gaps
  • Root cause analysis on SAIDI
  Completion Date: Immediate

• Suggested foundational first steps:
  • Develop utility strategic plan
  • AMI pilot
  Completion Date: Early 2020

• Strategic next steps:
  • Develop customer program roadmap
  • Develop technology roadmap
  • Implement first customer program
  • Deploy AMI
  Completion Date: 2020, 2021, Early 2021

REMEMBER!
Do all of this is in addition to:
• Maintaining your operation
• Maintaining a skilled workforce
• Continuing to collect data on customers and metrics
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## Case Study #2

### Customer Survey Results

<table>
<thead>
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<td><strong>Communicating</strong> with customers</td>
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<td>77.9</td>
<td>77.4</td>
<td>82.1</td>
</tr>
<tr>
<td><strong>Reliable</strong> electric service</td>
<td>93.8</td>
<td>91.0</td>
<td>91.1</td>
<td>92.9</td>
</tr>
<tr>
<td>Providing <strong>good value</strong> for the cost of electricity</td>
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<td>64.4</td>
<td>64.3</td>
<td>68.7</td>
</tr>
<tr>
<td><strong>Responsible steward of the environment</strong></td>
<td>85.9</td>
<td>83.0</td>
<td>60.0</td>
<td>82.0</td>
</tr>
<tr>
<td><strong>Responding promptly</strong> to questions and complaints</td>
<td>85.1</td>
<td>83.0</td>
<td>77.0</td>
<td>82.1</td>
</tr>
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<td>82.3</td>
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<td>85.3</td>
</tr>
</tbody>
</table>

*NC Public Power and competitor scores based off of 2017 and 2018 survey results
Utility Assessment for Example #2

- **SAIDI:** 8 minutes/year
- **Cost:** Higher than all traditional competitors
- **Staff:** Missing key staff capabilities
- **Procedures:** Missing security procedures, emergency response procedures, and key financial procedures
- **Cost of Service:** Performed recently
- **Billing System:** Substandard billing system in place
- **Customer communication plan:** Plan in place
- **Meters:** Manual read
- **Online bill pay:** Not in place
- **Access to high speed data:** Yes
- **Long-term Planning:** Long-term capital plan in place (investment criteria)
- **Strategic Plan:** Not in place
- **Tech Roadmap:** Not in place
- **Outage management system:** Not in place
- **Time of use rates:** Not offered
- **Analytics:** Not in place
- **Smart city:** No smart city capabilities
- **System Losses:** 10%
Example #2

<table>
<thead>
<tr>
<th>GROUP A</th>
<th>GROUP B</th>
<th>GROUP C</th>
<th>GROUP D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status Quo / Tech Cautious</td>
<td>Savings Seeker / Movers &amp; Shakers</td>
<td>Movers &amp; Shakers / Green Champion</td>
<td>Movers &amp; Shakers / Green Champion</td>
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</tbody>
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**CUSTOMER EXPECTATIONS:**
- Low Cost
- Reliable

**UTILITY CAPABILITIES:**
- Reliable Power (SAIDI)
- Low Cost (Comparison)
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- Requisite Skillsets
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**CUSTOMER EXPECTATIONS:**
- Group A +
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- Choice of Supply
- Smart Building
- Energy Cloud

**CUSTOMER EXPECTATIONS:**
- Groups A + B + C +
- Data Analytics
- Smart City - Integration Out Of The Utility

**UTILITY CAPABILITIES:**
- Groups A + B +
- Advanced Meter Infrastructure
- Staff 3.0
- Tech Road Map
- Outage Management System
- Time Of Use
- Data Analytics

**TIMEFRAME TO MEET EXPECTATIONS**
- 1 YR (If not yet in GROUP A)
- 2 YRS
- 3 YRS
- 5 YRS
- 15+ YRS
Case Study #2: Recommendations

• Suggested immediate actions: Completion Date
  • Address procedure gaps Immediate
  • Address system losses Immediate
  • Conduct skills assessment for staff Immediate

• Suggested foundational first steps:
  • Develop utility strategic plan Early 2020

• Strategic next steps:
  • Develop customer program roadmap 2020
  • Develop technology roadmap 2020
  • Take next appropriate steps per roadmaps 2021

REMEMBER!
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• Maintaining a skilled workforce
• Continuing to collect data on customers and metrics
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Questions and Discussion
Participate in conference discussions on Twitter:
#ECAC2019

@ncpublicpower
@ElectriCitiesNC
facebook.com/Electricities
ROADMAP – Key Takeaways

• All groups have some number of customers from Group D (Green Champions and Movers & Shakers). It’s important to monitor that customer segment.

• You don’t have to make an entire move to another group. Selecting elements to implement from another group may make more sense.

“A GOOD hockey player plays where the puck is. A GREAT hockey player plays where the puck is going to be.”

- Wayne Gretzky
To be successful in this environment, Public Power utilities must do the following:

- Focus on customers more than ever before
- Adopt a strategic plan, an entrepreneurial outlook, and identify new business opportunities
- Recruit and retain key employee skillsets (new and old), and pay competitively
- Identify value in partnerships and collaboration, both internally and externally
- Continually remind all stakeholders of the Public Power value proposition; shamelessly self-promote
- Take more risks, accept failures and learn from them

“Both the External and Internal Game Changers indicate a shift to an industry that is more rapidly transforming, with technology playing an increasingly important role”

Center for Energy Workforce Development, State of the Energy Workforce 2018 report