2020
Strategic Directions: Smart Utilities Survey Results
Black & Veatch Insights Group
Study Overview

Methodology

- Administered online from
- 11 October 2019 through
- Black & Veatch was identified as the sponsor of the study.
- Weekly email reminders were sent to encourage participation.
- Eligible survey participants were given the option to receive a
  $20 gift card or $20 charitable donation and the full report.
- The median length of the survey was 6 minutes.

Sampling Plan

- Screening questions were included at the beginning of the survey to ensure only qualified participants were allowed to complete the survey.
- Both electric services and industry providers were included in the sample.
- About 108,000 email invitations were deployed to professionals across the United States.

Survey Results

- 627 survey respondents qualified and completed a majority of their given survey.
  - 557 respondents qualified and completed the full survey; 70 of those were partial records.
- Overall response rate for the survey was 1 percent.
- Because the survey was administered online, the amount of self-selection bias is unknown, therefore, no estimates of sampling error have been calculated.
- Statistical significance testing was conducted on the survey results to determine major findings and differences.
Which, if any, of the following utility services does your organization provide? *(Select all that apply)*

71.0%  
**Electric Services:** Provides electric services, distributes, transmits, generates, retails or sells electricity

23.0%  
**Water Services:** Provides water services, including water, wastewater or stormwater services

30.9%  
**Natural Gas Services:** Provides natural gas services, produces, gathers, transports, distributes, or sells/trades natural gas

11.6%  
We provide other types of services
What is the estimated population served by your organization? (Select one choice)

10.3%  Less than 100,000
18.1%  100,000-499,999
14.6%  500,000-999,999
15.3%  1,000,000-1,999,999
41.7%  2,000,000 or more
What job function do you currently hold within your company?

(Select one choice)

17.1% Vice president or executive

33.7% Director, supervisor or manager

25.2% Engineer or operator

24.0% Other
What are the top three drivers for modernizing your electric distribution system? *(Select up to three)*

- **66.4%** Improve the reliability of the grid
- **42.7%** Improve operational efficiency
- **42.7%** Aging infrastructure
- **39.0%** Increase monitoring, control and automation capabilities
- **29.5%** Integrate renewable energy
- **24.5%** Employee and public safety
- **12.0%** Improve cybersecurity
- **11.6%** Increase customer engagement/empowerment
- **6.2%** Regulatory benefits
- **6.2%** New product offerings
- **5.8%** Support electrification of transportation
How much capital do you plan to invest in modernizing the distribution system over the next three years?

*(Select one choice)*

- **1.2%** None
- **15.0%** Less than $10 million
- **21.0%** $10 million to $50 million
- **16.2%** $50 to $100 million
- **13.8%** $100 million to $200 million
- **32.9%** More than $200 million
What are the top three barriers your utility is facing to enable smart distribution infrastructure? *(Select up to three)*

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Barrier</th>
</tr>
</thead>
<tbody>
<tr>
<td>54.1%</td>
<td>Budget constraints</td>
</tr>
<tr>
<td>37.6%</td>
<td>Other competing priorities</td>
</tr>
<tr>
<td>36.6%</td>
<td>Regulatory hurdles</td>
</tr>
<tr>
<td>35.1%</td>
<td>Lack of resources or expertise</td>
</tr>
<tr>
<td>23.9%</td>
<td>Communications network capabilities</td>
</tr>
<tr>
<td>22.9%</td>
<td>Data quality or data issues</td>
</tr>
<tr>
<td>19.5%</td>
<td>Gaining stakeholder support</td>
</tr>
<tr>
<td>18.0%</td>
<td>Ownership across departments</td>
</tr>
<tr>
<td>12.7%</td>
<td>Availability of technology</td>
</tr>
<tr>
<td>10.7%</td>
<td>Waiting for others to pave the way</td>
</tr>
<tr>
<td>5.4%</td>
<td>Unwillingness to look at opportunities in the unregulated arena</td>
</tr>
</tbody>
</table>
Please indicate the horizon(s) your organization uses in documenting a strategic vision for growth.

- 1-3 years: 20.6%
- 4-7 years: 48.0%
- 8-12 years: 13.3%
- >12 years: 14.5%
- Our organization does not document a strategic vision for growth: 3.6%
### Which technologies or initiatives do you feel are most important to managing your distribution system?

<table>
<thead>
<tr>
<th>Technology</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervisory control and data acquisition</td>
<td>47.7%</td>
</tr>
<tr>
<td>Advanced metering infrastructure</td>
<td>40.7%</td>
</tr>
<tr>
<td>Fault location isolation &amp; supply restoration</td>
<td>33.7%</td>
</tr>
<tr>
<td>Automated circuit breaking devices</td>
<td>31.3%</td>
</tr>
<tr>
<td>Advanced distribution management system</td>
<td>30.5%</td>
</tr>
<tr>
<td>Cybersecurity</td>
<td>24.3%</td>
</tr>
<tr>
<td>Distributed energy management system</td>
<td>22.6%</td>
</tr>
<tr>
<td>Customer Information systems</td>
<td>18.1%</td>
</tr>
<tr>
<td>Demand response management system</td>
<td>16.9%</td>
</tr>
<tr>
<td>Conservation voltage reduction and voltage/VAR</td>
<td>14.0%</td>
</tr>
<tr>
<td>Field area networks</td>
<td>9.1%</td>
</tr>
<tr>
<td>None of the above</td>
<td>7.4%</td>
</tr>
</tbody>
</table>
What are the top three major challenges your team is facing with your current electric distribution system?

(Select up to three choices)
Do you currently or expect to monitor or control third-party-owned distributed energy resources that are connected to your distribution system? (Select one)

19.4%
Yes, we currently monitor and control third-party-owned DER

38.9%
Yes, we currently monitor third-party-owned DER

9.7%
We don’t currently but are planning to monitor and control third-party-owned DER

13.9%
We don’t currently but are planning to monitor third-party-owned DER

18.1%
No, we don’t monitor or control third-party-owned DER and have no plans to do so
On a scale from 0 to 5, to what degree are non-wires alternatives being considered at your utility? (Select one)

5 23.8%
We consider non-wires alternatives as part of our standard operating procedures

4 13.9%
Cost studies/pilot programs are underway

3 10.6%
Cost studies/pilot programs are being planned

2 21.9%
We are just beginning to consider non-wires alternatives

1 9.9%
Has previously been considered but no plans for implementation

0 19.9%
Not being considered and have never been considered
Are there policy or other drivers (economic, social, etc.) requiring your organization to consider non-wires alternatives in your transmission and/or distribution planning functions?

(Select all that apply)

- **32.7%**
  No, no such drivers exist today and don’t foresee them

- **29.1%**
  None today but we expect those drivers to soon impact our considerations

- **22.4%**
  Regulatory policies exist that require us to consider NWA

- **12.8%**
  Economic drivers exist that require us to consider NWA

- **12.8%**
  Other drivers exist that require us to consider NWA (such as societal benefit or customer demand)
How is your organization viewing the importance of integrating its planning functions (e.g., transmission, distribution and resource planning)?

(Select one)

- **Very Important**: 45.7%
- **Extremely Important**: 34.6%
- **Moderately Important**: 14.2%
- **Slightly/not at all important**: 5.6%
Where is your organization in terms of your journey to integrate its planning functions? *(Select one)*

- **11.1%** We have mostly integrated planning functions
- **38.5%** We have fully integrated planning functions
- **41.6%** We have partially integrated planning functions
- **5.3%** Haven't started integration but we recognize the need
- **3.5%** Haven't started integration and have no plans to
Do you plan to increase the number of communicating devices throughout your service territory in the next five years? (Select all that apply)

- Substation automation devices: 45.0%
- AMI devices: 42.5%
- DA or DMS: 37.5%
- Field force automation devices: 28.3%
- Land mobile radio devices: 24.2%
- No, we have no plans to increase communications devices in the next five years: 15.0%
How do distributed assets factor into discussions about reliable and resilient communications?

52.4%
The increase in our distributed asset portfolio will require improvements to our communications network

23.3%
The increase in our distributed asset portfolio will not require improvements to our communications network

15.5%
We aren’t planning for additional distributed assets but are seeking communications network improvements

8.7%
We aren’t planning for additional distributed assets and are not seeking communications network improvements
What percent of your sites are connected or supported by the following technologies?

<table>
<thead>
<tr>
<th>Technology</th>
<th>Less than 20%</th>
<th>20% to 80%</th>
<th>More than 80%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiber optic cable</td>
<td>22.4%</td>
<td>52.3%</td>
<td>25.2%</td>
</tr>
<tr>
<td>Microwave communications</td>
<td>56.7%</td>
<td>34.0%</td>
<td>9.3%</td>
</tr>
<tr>
<td>RF/WiMAX</td>
<td>65.2%</td>
<td>21.7%</td>
<td>13.0%</td>
</tr>
<tr>
<td>3G/4G LTE-leased wireless</td>
<td>30.9%</td>
<td>53.6%</td>
<td>15.5%</td>
</tr>
<tr>
<td>Leased line 2Wire/4Wire or T1</td>
<td>48.9%</td>
<td>40.4%</td>
<td>10.6%</td>
</tr>
<tr>
<td>Serviced by legacy SONET transport</td>
<td>60.0%</td>
<td>27.1%</td>
<td>12.9%</td>
</tr>
<tr>
<td>DWDM transport</td>
<td>69.0%</td>
<td>20.2%</td>
<td>10.7%</td>
</tr>
</tbody>
</table>
What steps has your utility taken to prepare for the increased volume of 5G and fiber broadband attachment applications?

*Select one*

12.2%
Aggressive support from leadership with special teams and new processes

16.5%
Created a group specifically to address 5G and fiber applications

15.7%
Created specific processes that streamline application process

3.5%
Added staff to help handle the volume

52.2%
Will process applications as before
Which of the following most accurately describes how your utility perceives 5G attachment on your infrastructure? (Select one)

- 48.7% As an opportunity
- 26.5% As a requirement
- 24.8% As a challenge with limited commercial value
Are you currently planning to upgrade your communications network infrastructure? *(Select one)*

- **44.1%**
  - Yes, we are currently planning or upgrading both wireless and fiber networks

- **23.7%**
  - Yes, we are currently planning or upgrading our wireless networks

- **10.8%**
  - Yes, we are currently planning or upgrading our fiber optics networks

- **21.5%**
  - No, we are not currently planning or upgrading our communications infrastructure
Which of the following are concerns you have with your current wireless network infrastructure?

<table>
<thead>
<tr>
<th>Concern</th>
<th>Extremely concerned</th>
<th>Very concerned</th>
<th>Moderately concerned</th>
<th>Slightly concerned</th>
<th>Not concerned at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doesn’t meet coverage requirements</td>
<td>4.4%</td>
<td>18.9%</td>
<td>33.3%</td>
<td>24.4%</td>
<td>18.9%</td>
</tr>
<tr>
<td>Doesn’t meet capacity/performance requirements</td>
<td>6.6%</td>
<td>31.9%</td>
<td>22.0%</td>
<td>25.3%</td>
<td>14.3%</td>
</tr>
<tr>
<td>Obsolescence, infrastructure no longer supported by the OEM/vendor community</td>
<td>12.2%</td>
<td>22.2%</td>
<td>15.6%</td>
<td>27.8%</td>
<td>22.2%</td>
</tr>
<tr>
<td>Lack of knowledge of location and condition of assets</td>
<td>3.3%</td>
<td>10.0%</td>
<td>25.6%</td>
<td>24.4%</td>
<td>36.7%</td>
</tr>
</tbody>
</table>
How reliant are your operations on third-party communications carriers? *(Select one)*

- **49.2%** Use some external network but only for non-critical services
- **14.4%** Use only private network
- **24.6%** Use all external network but build in redundancy
- **11.9%** Completely reliant on external network
Have you implemented or plan to implement active cybersecurity monitoring of communication and data devices? *(Select one)*

- **50.4%** Have implemented and plan to increase
- **33.3%** Have implemented
- **13.2%** Planning to implement
- **3.1%** Have neither implemented nor plan to implement
<table>
<thead>
<tr>
<th>Percentage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>25.8%</td>
<td>Yes, and it operates 24/7 with EMS control center integration</td>
</tr>
<tr>
<td>8.9%</td>
<td>Yes, and it integrates with EMS</td>
</tr>
<tr>
<td>33.1%</td>
<td>Yes, and it operates 24/7</td>
</tr>
<tr>
<td>8.1%</td>
<td>Yes, but it does not operate 24/7 nor integrate with EMS</td>
</tr>
<tr>
<td>24.2%</td>
<td>No, we do not have a centralized Network Operations Center</td>
</tr>
</tbody>
</table>
Do you have a Security Operations Center? If so, how does it operate?

(Select one)

- **54.0%** Yes, and it operates 24/7
- **33.1%** No, we do not have a Security Operations Center
- **12.9%** Yes, but it does not operate 24/7
When does your utility plan to place operations technology applications in a cloud service environment? *(Select all that apply)*

- **37.5%**
  - We already have some aspects of operations in a cloud environment

- **17.0%**
  - We are currently moving some operations to a cloud environment

- **12.5%**
  - We plan to move some operations in the next two or three years

- **5.4%**
  - We plan to move some operations in the next year

- **31.3%**
  - No current planning for this
What are the top three risks that your organization must manage? *(Select up to three)*

- **60.2%**
  - Regulatory

- **37.1%**
  - Customer expectations

- **34.0%**
  - Environmental compliance

- **33.2%**
  - Technological change

- **29.0%**
  - Nature (storms, climate change, etc.)

- **23.9%**
  - Political

- **21.2%**
  - Market competition

- **20.8%**
  - Labor

- **13.5%**
  - Shareholder
How well do you think your organization assesses enterprise-level risks? *(Select one)*

- Industry leading: 6.7%
- Above average: 42.5%
- Average: 41.7%
- Below average: 8.3%
- Well below average: 0.8%
<table>
<thead>
<tr>
<th>Percentage</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>47.0%</td>
<td>We are currently operating a program</td>
</tr>
<tr>
<td>20.8%</td>
<td>We are implementing a program</td>
</tr>
<tr>
<td>10.4%</td>
<td>We are designing a program</td>
</tr>
<tr>
<td>6.4%</td>
<td>We are planning to design a program</td>
</tr>
<tr>
<td>4.5%</td>
<td>We have no interest in such a program</td>
</tr>
</tbody>
</table>
How effective are the following approaches in assessing risk failure of your T&D assets?

(Rank from 1-most effective to 5-least effective)

<table>
<thead>
<tr>
<th>Approach</th>
<th>First</th>
<th>Second</th>
<th>Third</th>
<th>Fourth</th>
<th>Fifth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analyzing root cause and lessons learned from prior failures</td>
<td>39.0%</td>
<td>26.0%</td>
<td>16.2%</td>
<td>14.3%</td>
<td>4.5%</td>
</tr>
<tr>
<td>Prior maintenance data and trending</td>
<td>14.3%</td>
<td>23.4%</td>
<td>34.4%</td>
<td>17.5%</td>
<td>10.4%</td>
</tr>
<tr>
<td>Visual, hands-on inspections and testing</td>
<td>24.7%</td>
<td>20.8%</td>
<td>15.6%</td>
<td>12.3%</td>
<td>26.6%</td>
</tr>
<tr>
<td>Operational data analysis and predictive modeling</td>
<td>16.9%</td>
<td>11.0%</td>
<td>24.7%</td>
<td>39.0%</td>
<td>8.4%</td>
</tr>
<tr>
<td>Gathering industry data and participating in working groups on the topic</td>
<td>5.2%</td>
<td>18.8%</td>
<td>9.1%</td>
<td>16.9%</td>
<td>50.0%</td>
</tr>
</tbody>
</table>
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