Survey Methodology

- This Smart Grid Industry Survey is the first of a two-part market analysis study designed to understand utility deployment patterns and preferences with regard to Smart Grid networking and network management in North America. The second part of the study involved qualitative interviews with utilities.

- Pike Research conducted a web-based survey of 176 Smart Grid industry participants using a structured online questionnaire, developed jointly by Aviat Networks and Pike Research.

- The survey was conducted in February and March 2010.

- The sample included industry participants who responded to a questionnaire fielded by Pike Research in partnership with Earth2Tech and the Utilities Telecom Council (UTC).

- Respondents were screened on the bases of company type and their company’s involvement in Smart Grid programs. A total of 35 qualified utility respondents were identified in the sample, 17 of which stated that they are currently planning a Smart Grid deployment.

- Because the sample sizes in this survey are too small for true statistical analysis most results are presented in terms of the raw numbers of responses.
Key Findings

- Among utility respondents with Smart Grid deployment plans, the majority of projects are already underway. However, our survey results indicate that utilities still have a lot of key decisions to make with regard to technology and vendor selections.

- Wireless technologies are considered very important elements of Smart Grid programs for the utilities surveyed. RF Mesh, ZigBee, and WiMAX were the three most important technologies being considered, according to our survey.

- Respondents indicated a general preference for private wireless networks. Security was cited as the most important issue for wireless data networks.

- WiMAX is being considered by nearly half the utilities surveyed. Distribution Automation was the application holding the most interest for utilities interested in WiMAX. Respondents are still looking at a variety of spectrum options, and many are not sure which path they will take with regard to spectrum. Motorola and Alvarion are the WiMAX vendors most frequently being considered.

- Utility engineering departments are the most important decision-makers with regard to wireless data transmission purchase decisions and vendor selections.
Question: Which of the following best describes your organization?

Out of 176 total respondents, 35 stated that they work for an electric utility.
• **Question:** Which of the following best describes your own function at your electric utility company?

• Among utility respondents, the largest portion stated that they are in an engineering/technology role at their company. Other functions were distributed among several additional categories.
Smart Grid Deployment Plans

• **Question:** Does your utility currently have plans to deploy Smart Grid technologies?

• 17 respondents stated that their company currently has plans to deploy Smart Grid enhancements. This group was selected to answer the remaining questions in the survey.
Timing of Smart Grid Initiatives

• **Question:** When do you plan to begin implementation of a Smart Grid initiative?

• A majority of respondents stated that their Smart Grid initiatives are already underway. About half of the remainder stated that their project would begin within the next year.
Smart Grid Spending Plans

• **Question:** Which of the following best describes your utility’s forecast for Smart Grid spending over the next three years?

• A minority of respondents identified a specific range of Smart Grid spending increases by 2012. About a third of respondents stated that they were not sure what their utility’s plans would be with regard to budget.

![Pie chart showing the percentage of respondents by spending increase scenario.]

- **Increase of 0% by 2012:** 6%
- **Increase of 10% by 2012:** 6%
- **Increase of 30% by 2012:** 18%
- **Increase of 50% by 2012:** 12%
- **Increase of 70% by 2012:** 6%
- **Not sure by 2012:** 35%
- **Other amount:** 23%
Importance of Data Network Capabilities

**Question:** Please rate the importance of each of the following items with respect to the data transmission of a Smart Grid network.

When asked to rate the importance of various Smart Grid data network capabilities, Security was the top priority among respondents, followed by Speed/Performance. Spectrum Issues were the least important priority.
Importance of Wireless Technologies

• **Question:** Please rate the importance of wireless technologies in your Smart Grid network.

• The majority of respondents stated that wireless technologies are “critical” or “very important” in their Smart Grid network. Most of the remainder stated that they are “important”.

![Pie chart showing the percentage of respondents rating wireless technologies as critical, very important, important, and somewhat important or unimportant.](image)
Suitable Wireless Technologies

• **Question:** Which of the following wireless technologies do you consider most suitable for your Smart Grid communications infrastructure deployment?

• RF Mesh, ZigBee, and WiMAX were most often identified as the most suitable wireless technologies for respondents’ Smart Grid deployments.
• **Question:** Which of the following best describes your organization’s status for wireless technology selection and deployment for your Smart Grid data transmission network?

• The majority of respondents stated that they have not yet made a decision on wireless technologies or vendors, and are still weighing their options.
Public/Private Networks

• **Question**: Do you prefer public or private wireless transmission networks for your Smart Grid deployment?

• When asked whether they prefer public or private wireless networks for Smart Grid deployments, the great majority of respondents stated that private networks were their preference. Three respondents said they had no preference.
**Decision Factors for Public/Private Networks**

- **Question:** Please choose key factors in your decision of whether to deploy a public or private wireless network.

- Respondents stated that Security was their top concern when making a decision about whether to deploy public or private wireless networks. Other key factors included Service Reliability and Lack of Control over Service.

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<th>Factor</th>
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<td>Security</td>
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<tr>
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<td>Cost</td>
<td>6</td>
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<tr>
<td>Other, please specify</td>
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**Others mentioned:**
- The difficulties of obtaining spectrum have significantly delayed our deployment for WiMax. We remain hopeful we will be able to secure needed spectrum. All other issues identified above are secondary to securing spectrum.
- Not deploying wireless network for smart grid
WiMAX as a Technology Option

- **Question:** Are you considering WiMAX as a communications technology option for your Smart Grid network?

- Nearly half of respondents stated that they are considering WiMAX for their Smart Grid deployment.
WiMAX Frequencies

• **Question:** You stated that you are considering WiMAX as a communications option. Which frequency or frequencies are you considering? (select all that apply)

• Among respondents considering WiMAX, the largest number stated that they were not yet sure which frequency they would use. The remaining responses were distributed among the various options offered in the questionnaire.

- Not Sure: 4
- 3.65 GHz: 2
- 2.5 GHz: 2
- Other, please specify: 1
- 4.9 GHz: 1
- 1.8 GHz: 1
- 700 MHz: 1
- None of the above: 0
- 5.8 GHz: 0
WiMAX Applications

• **Question**: Which applications are you looking to deploy WiMAX for?

• Distribution Automation was the most commonly selected application for respondents considering WiMAX, followed by AMI and backhaul applications.

*Other comment:*
*Insufficient spectrum available for mobile workforce.*
WiMAX Vendors

• **Question:** Which WiMAX vendor(s) are you considering or presently working with?

• Motorola and Alvarion were the two most frequently mentioned vendors among respondents considering WiMAX Smart Grid deployments.

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Others mentioned:
- Unknown
- Full Spectrum, Calamp
- Our vendor who is writing specification has contact with various vendors
Microwave Deployments

• **Question:** Are you planning new point-to-point microwave deployments or upgrades to existing microwave as part of your Smart Grid deployment?

• Respondents were split on whether they were considering new microwave deployments (7), not considering such deployments (6), or not sure (4).
Timing of Microwave Deployments

**Question:** When will the new microwave deployments take place?

Among respondents planning a new microwave deployment, the majority stated that these would occur within the next 2 years.
Microwave Vendor Satisfaction

• **Question:** If you have microwave, rate your satisfaction with your microwave supplier(s).

• Among utility respondents who have microwave, satisfaction scores for microwave vendors were very close together. Alcatel-Lucent and Aviat Networks customers provided the highest satisfaction ratings.
Routing/Switching Technologies

• **Question:** In terms of data transmission network design, what types of routing/switching technologies do you prefer to implement in your network?

• When asked about their preferences for routing/switching technologies for data transmission networks, the clear majority selected IP/Ethernet.

Other Mentioned:
- Ethernet over frame relay
NMS Upgrade Plans

• **Question:** Do you plan to purchase a new Network Management System (NMS) or upgrade your existing system?

• A significant number of survey respondents stated that they plan to purchase a new NMS or upgrade an existing system. An equal number were unsure of their plans in this area.
**NMS Upgrade Timing**

- **Question**: When will the new NMS purchase or upgrade take place?

- Respondents planning an NMS upgrade were very evenly split on the timing of their plans. The highest number who knew their plans stated that they planned such an upgrade within the next 2 quarters.
NOC Outsourcing

• **Question:** Would you consider outsourcing your Network Operations Center (NOC)?

• In terms of being open to outsourcing their NOC, respondents were evenly split between being unwilling and not sure. A minority of respondents stated that they would consider this move.
• **Question:** What are the challenges you are facing in managing your network? (select all that apply)
• **Question:** In terms of onsite security, do you currently have plans to implement or upgrade your security for asset and loss protection?

• Nearly half the survey respondents stated that they have plans to implement security upgrades.
• **Question:** Please rate the importance of the following site security elements.

• When asked to rate the importance of various site security elements, respondents stated that Remote Monitoring and Building Intrusion and Access Control were the two most important.
Vendor Evaluation Factors

- **Question:** Please rate the importance of the following factors to your company’s evaluation of data transmission equipment vendors.

- Respondents were asked to rate the importance of various factors in evaluating vendors. Aside from “other” factors (which were not specified), the commitment to future standards was the most highly rated dimension.
• **Question:** In terms of decision maker for wireless data transmission equipment vendors, who is the primary decision-maker in your organization?

• The majority of utility respondents stated that their Engineering Department is the primary decision-maker for choosing a wireless data equipment vendor.
Procurement Path Intentions

- **Question**: To purchase wireless data transmission equipment, do you plan to work with integrators, or buy directly from equipment manufacturers?

- Most respondents stated that they were not sure whether they would work with integrators or buy directly. Of those who knew what they would do, more said that they would work with integrators.