



Contemporary Perceptions of the Smart Grid

*Survey at the 37th Annual PURC Conference
February, 2010*



Survey Demographics

o *Survey Set A: PURC Conference Demographics*

- o PURC Officers 3%
- o Analysts and Consultants 23%
- o Energy Utility Operating Managers 22%
- o University Faculty 21%
- o Regulatory Commissioners and Staff 17%
- o Environmental Attorneys 11%
- o Energy Utility Suppliers 3%

o *Survey Set B: University Graduate Student Demographics*

- o MBA Entrepreneurship 33%
- o Master of Arts International Business 33%
- o MBA 21%
- o MS Engineering 6%
- o MS Finance 6%



Survey Parameters

- *15 Questions around topics focused on Smart Grid benefits, outcomes, and implementation (See Appendix A)*
- *Sample sets represent two distinct generations*
- *Sample sets represent two reference frames relative to the energy utility industry*
- *The survey seeks to measure the respondents:*
 - Willingness to use Smart Grid functionality
 - Confidence in purported Smart Grid benefits
 - Perception of convergence of the telecommunications and energy utility industries
 - Perception of achievability of renewable portfolio targets proposed at State and Federal levels
 - Perceptions of evolution of the retail energy retail markets
 - Perception of the source and economic impact of smart grid benefits

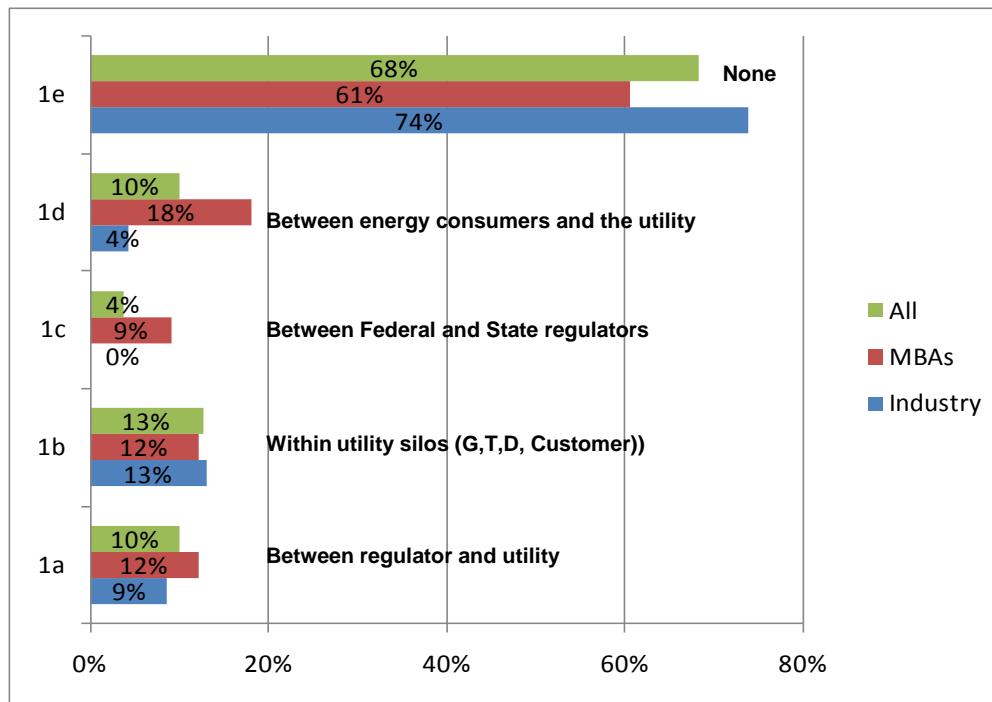


Survey Responses

- *There were 46 respondents from Subset A: Industry Participants
This subset represents the 40-60 age group*
- *There were 33 respondents from Subset B: Graduate Students
This subset represents the 24-30 age group*
- *There were 79 respondents in the combined survey
This subset represents all age groups*

What is the Smart Grid?

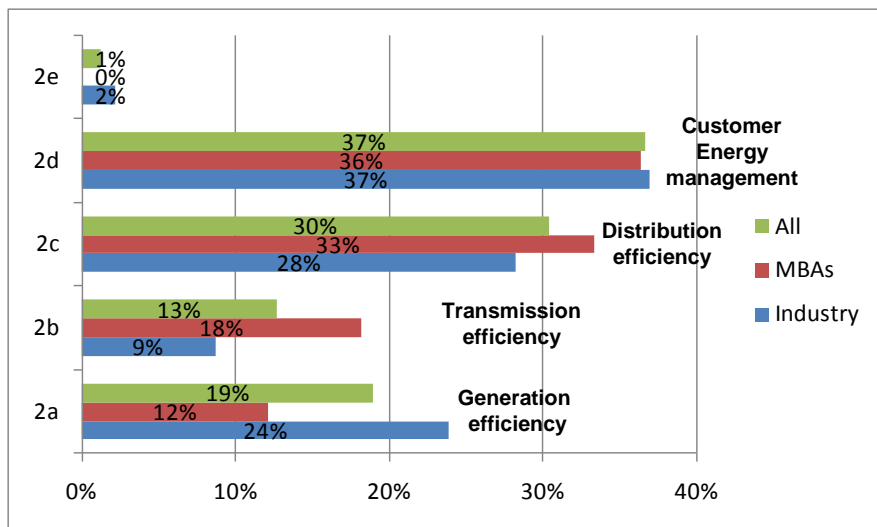
Is there a consensus definition of Smart Grid?



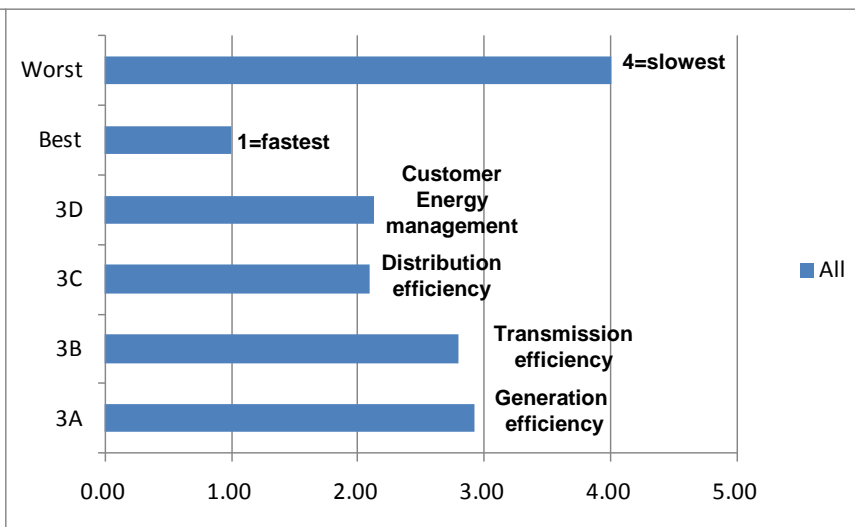
- ✓ *68% of all respondents agreed that there was NO consensus definition of Smart Grid, with the greatest response from industry professionals (3 out of 4)*
- ✓ *18% of MBAs saw a consensus between energy consumers and their utility, but only 4% of industry pros agreed*
- ✓ *Lack of a common and shared vocabulary and framework for explaining Smart Grid benefits and associated costs will likely extend the confusion over what Smart Grid is and lead to disappointment at many levels with Smart Grid results.*

Source of Smart Grid Benefits

Greatest Benefits of Smart Grid



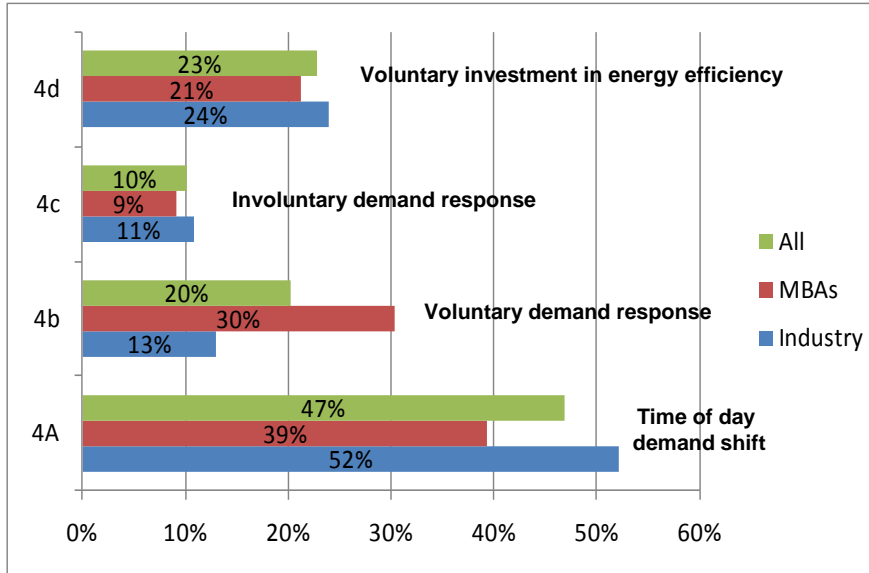
Fastest Payback From Smart Grid Investment



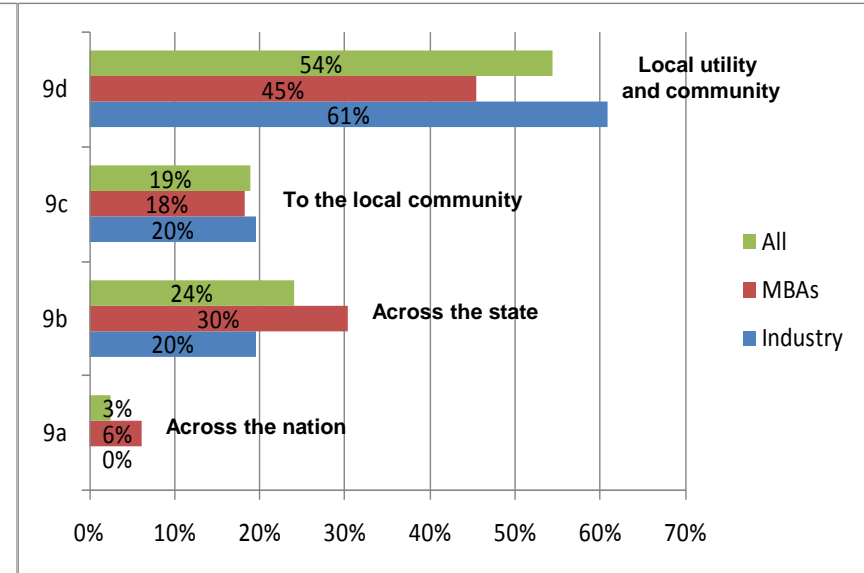
- ✓ 37% perceived customer energy management to provide the greatest economic benefits of smart grid, while 30% perceived the greatest benefits would come from distribution efficiency
- ✓ However, distribution efficiency was perceived to have a slightly faster investment payback than customer energy management
- ✓ Both transmission and generation efficiencies were perceived as lesser in benefits and slower in payback

Benefits from Smart Grid Deployment

Greatest Benefit of Customer Energy Management



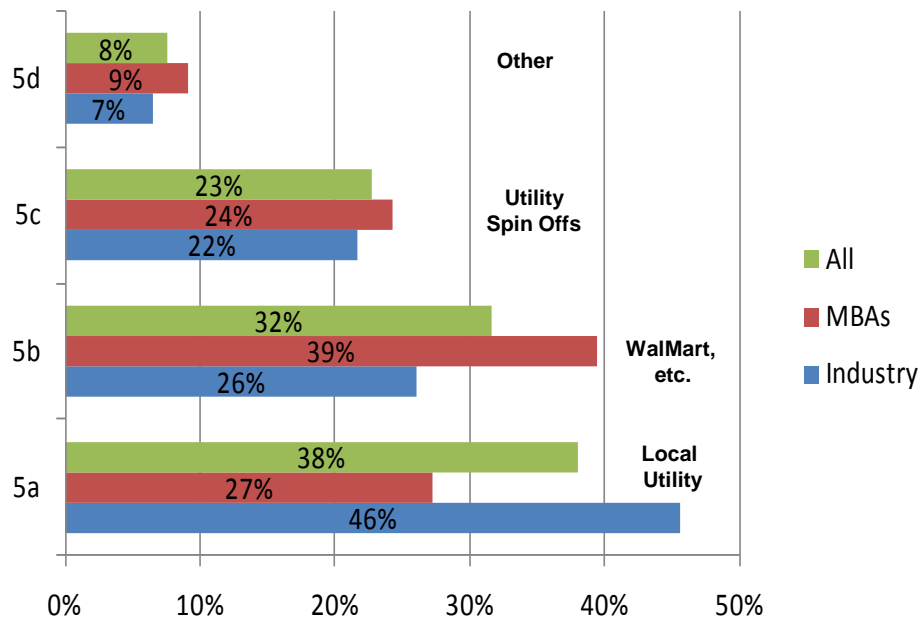
Locus of Smart Grid Benefits



- ✓ 1 out of 2 see the greatest benefit of customer energy management coming from shifting demand to different times of the day, 1 out of 5 see the greatest benefit from either voluntary demand response or investment in energy efficiency
- ✓ 1 out of 2 see most of the benefits of a fully deployed smart grid flowing to the local utility and community, 1 out of 5 see most of the benefits flowing to the State
- ✓ 6% of the MBA subset see most of the benefits at the national level, but none of the Industry subset see any benefits of a fully deployed smart grid flowing to the nation

In a Smart Grid World, Who Will Service the Customer?

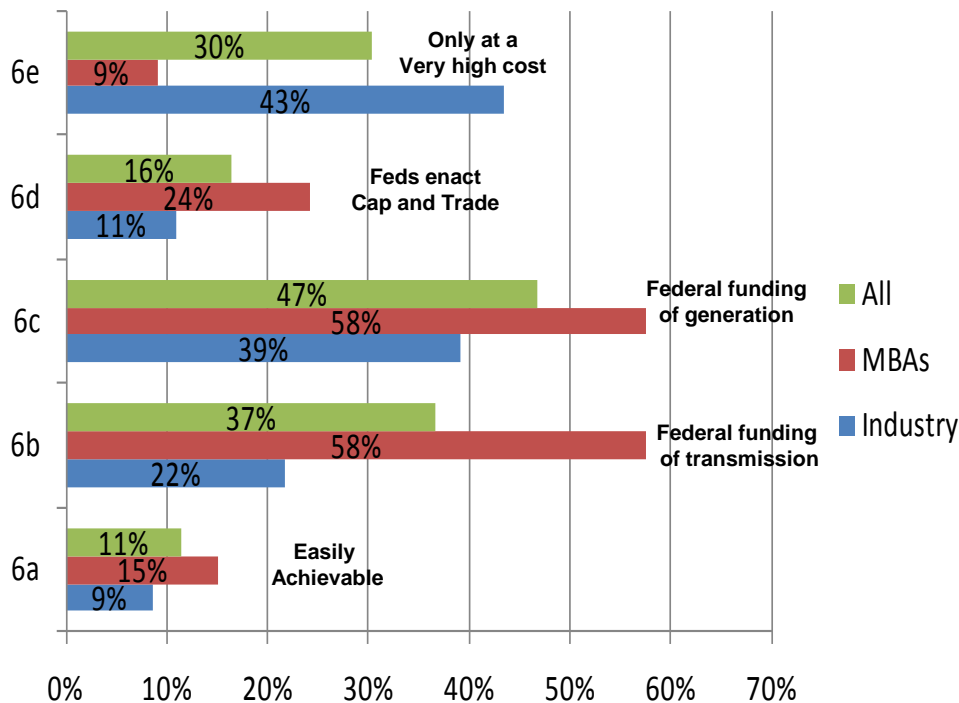
Future Retail Energy Marketers



- ✓ *Only half the Industry respondents and a quarter of the MBAs believe it will be the local utility*
- ✓ *A quarter of both groups believe it will be a utility marketing spin off*
- ✓ *40% of the MBAs and 25% of the Industry see retail marketers with deep consumer experience, e.g. WalMart, entering the market to sell retail energy packages*

Requirements to Achieve Renewable Portfolio Targets

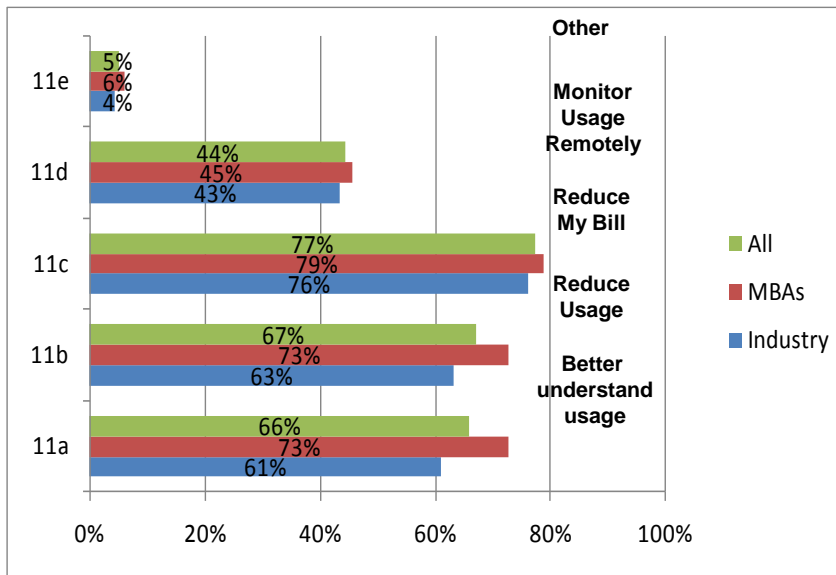
Requirements to Achieve Renewable Targets



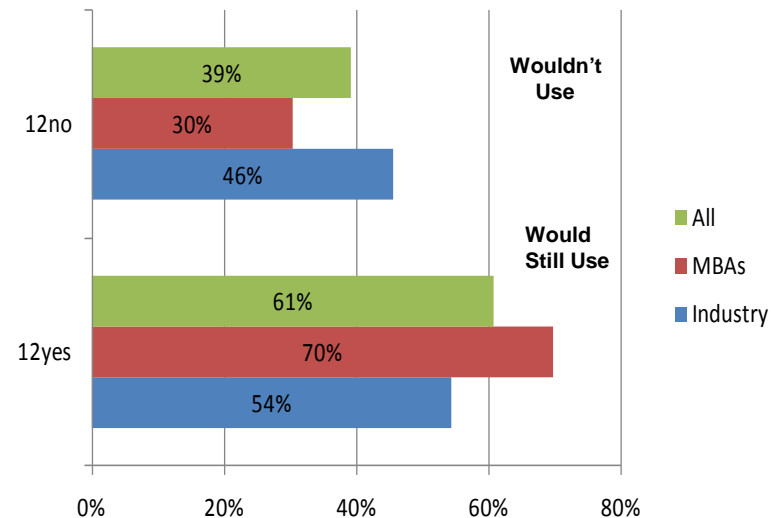
- ✓ *Industry respondents perceive achieving a renewable portfolio target would be very costly (43%) and would require Federal funding of generation investment (40%) and, to a lesser extent, transmission investment (22%). Only 1 out of 10 feel the need for a carbon Cap and Trade regime.*
- ✓ *15% of MBAs see portfolio targets as easily achievable but requiring Federal funding of both generation and transmission investment (60%). 1 out of 4 MBAs see a carbon Cap and Trade regime as required.*
- ✓ *10% of Industry respondents see renewable portfolio targets as easily achievable compared with 15% of MBAs.*
- ✓ *43% of Industry respondents see achieving renewable portfolio targets as achievable only at a very high cost compared with 9% of MBAs.*

Why and How Would You Use the Smart Grid?

Why Use Smart Grid Features?



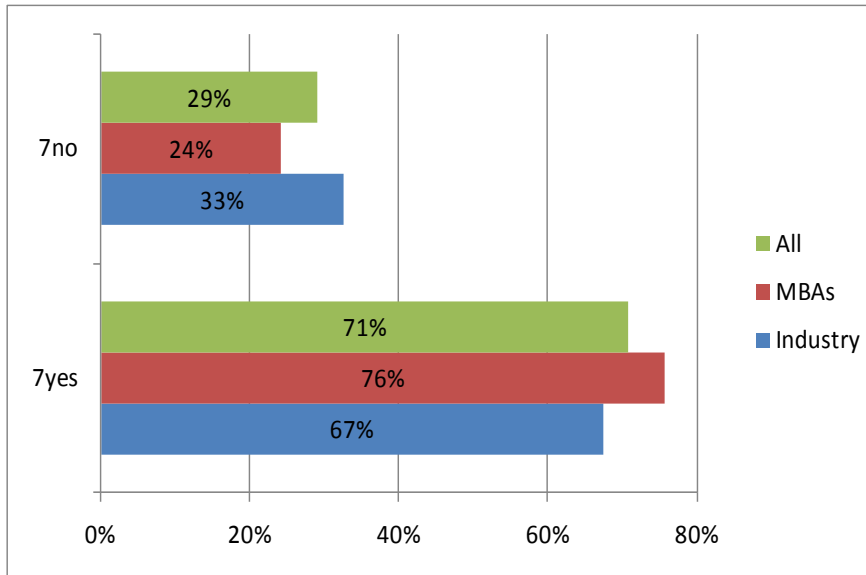
What if your bill isn't reduced?



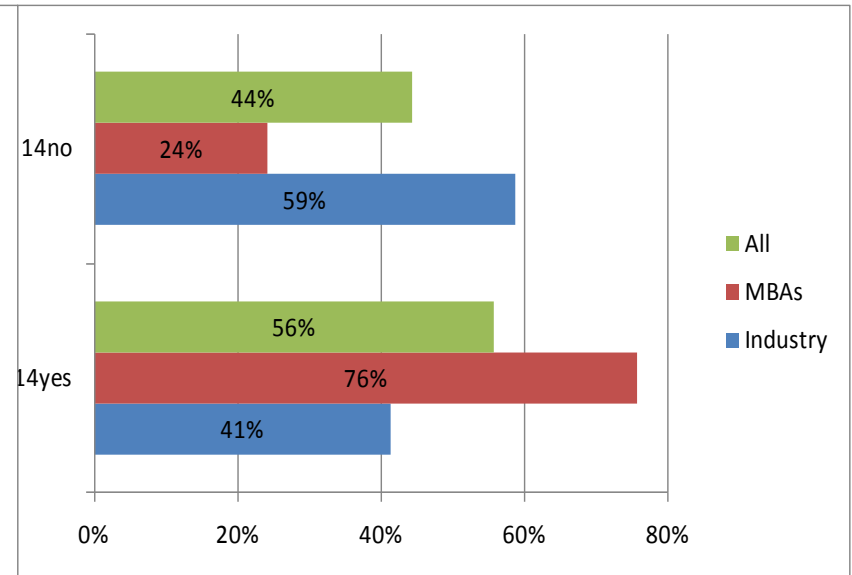
- ✓ *All respondents expresses strong (67-77%) interest in using Smart Grid derived information to understand and manage usage and to reduce energy bills. A smaller subset (44%) wanted to be able to monitor usage remotely.*
- ✓ *1 out of 2 Industry respondents and 3 out of 4 MBAs would still use Smart Grid functionality in their home if they saw no reduction in their bill – to understand and reduce usage*

Will Energy and Telecom Industries Converge?

Convergence of Energy and Telecommunications?



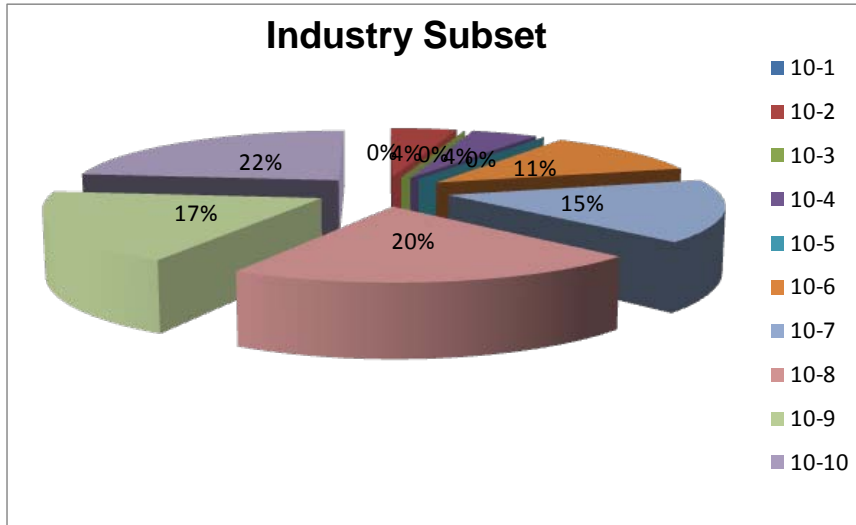
Would you buy Electricity from a Major Telco Provider?



- ✓ *71% of respondents agree that the electric energy and telecommunications industries are converging*
- ✓ *However, age differentiation appears in the question of whether the respondent would purchase electricity from a major (e.g. Verizon, Sprint, AT&T, T-Mobile) telecommunications provider*
 - Only 4 out of 10 Industry respondents would buy electricity from a telco provider. But...
 - 3 out of 4 MBAs would be willing to buy electricity from a telco

Importance of Telco Networks to Smart Grid Success

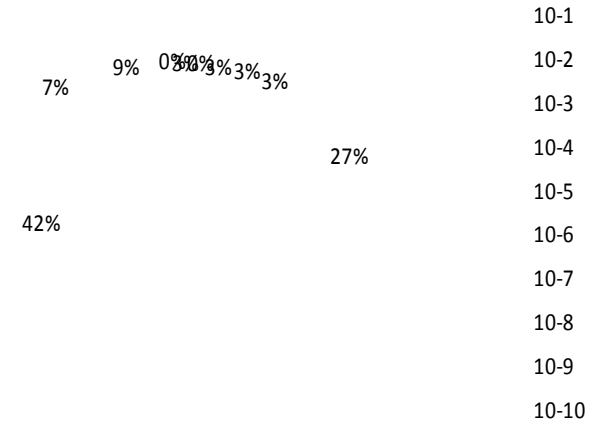
Importance of Telco Networks to Smart Grid Success



Scale of 1 (unimportant) to 10 (very important)

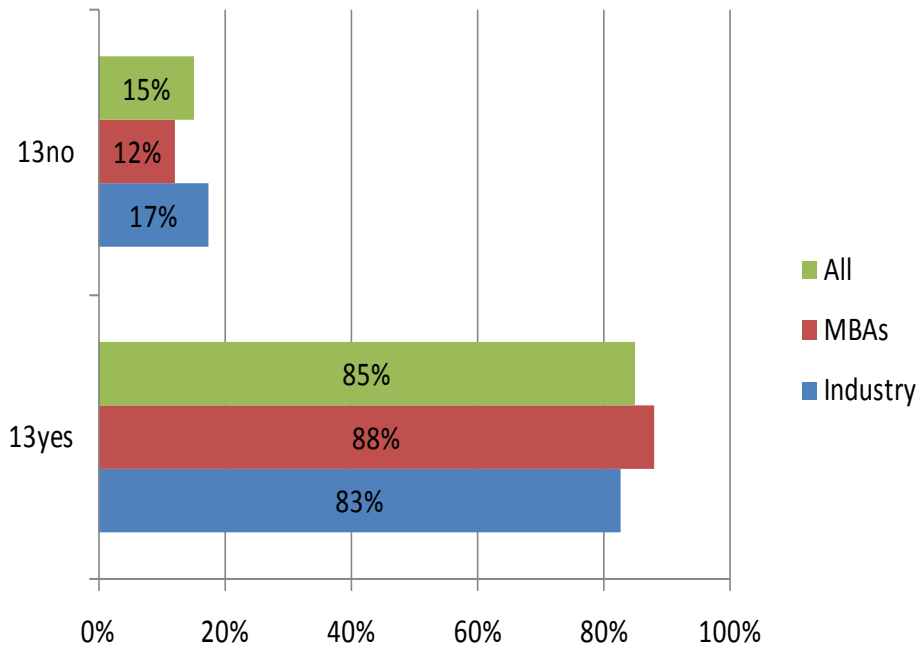
- ✓ 74% of Industry respondents rank the importance of telecommunications networks to a successful Smart Grid implementation 7 or higher (85% of MBAs)
- ✓ 22% of Industry respondents rank the importance of telecommunications networks a 10, while only 9% of MBAs do so
- ✓ Industry respondents see telecommunications networks as relatively more important to Smart Grid success than MBAs.

MBA Subset



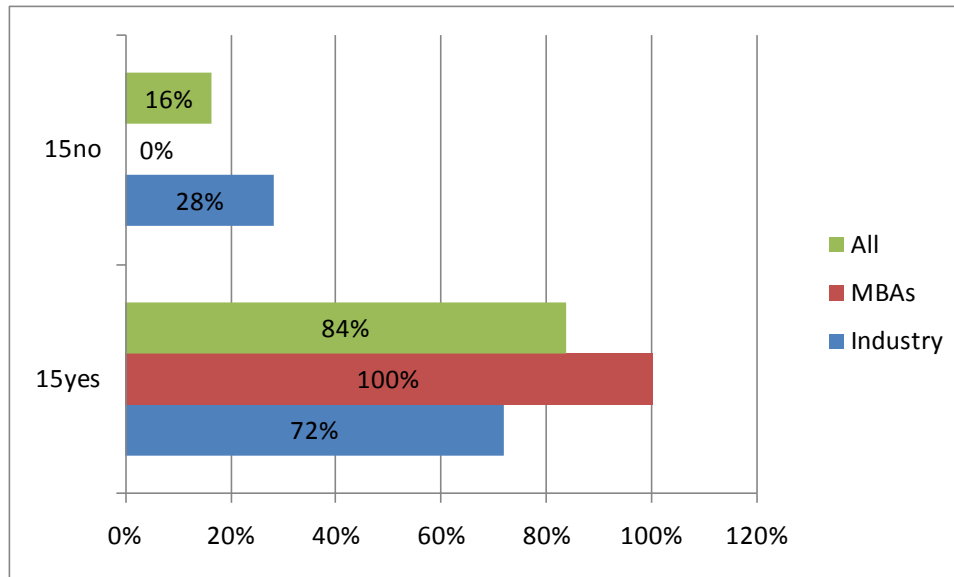
Scale of 1 (unimportant) to 10 (very important)

How Involved Do Customers Want to Be?



- ✓ *8 out of 10 respondents replied yes to the question, "If electric utilities could invest in digitizing the transmission/distribution grids and gain savings without touching customers (via in-home devices), would that interest you?"*
- ✓ *A few (less than 10%) annotated only if the savings was passed on in lower rates*

Electricity in the Communications Bundle



- ✓ *100% of responding MBAs said yes to this question and 72% of responding Industry professionals did the same.*
- ✓ *1 out of 3 Industry respondents would not buy electricity in a communications bundle EVEN IF they could save on their bill.*

If it provided Smart Grid functionality and provided a savings on your electric bill, would you be willing to buy electricity as a part of a communications bundle such as are offered by cable or telephone companies?



Summary and Observations

- ✓ *The absence of a common Smart Grid framework and vocabulary is a barrier to reaching agreement on its benefits and costs at all levels of stakeholders - politicians, regulators, utilities, consultants and energy consumers.*
- ✓ *There is broad agreement on the convergence of the electric energy and telecommunications industries. Further research is needed to determine how this convergence will manifest and at what segments of the energy value chain.*
- ✓ *There are generational differences revealed by the two sample subsets regarding the perception of telecommunications providers. The Industry subset appears less trustful of telco providers than the MBA subset (the mobile subset). This generational difference may bear on the rate of convergence of the two industries or on the successful entry of telco providers as marketers of electric energy packages to consumers.*



Summary and Observations

- ✓ *There is an appetite for information about energy usage and management of energy usage that does not depend on a reduced energy bill. Drivers of this phenomenon among energy consumers might be environmental concerns, an increasing focus on sustainability, energy security or a myriad of other factors. Again more research is called for to identify these drivers.*
- ✓ *There is a lack of clarity about where the benefits of a fully deployed Smart Grid manifest – nationally, regionally, or locally. There is an equal lack of clarity about where benefits will be derived – from generation, transmission, distribution, or customer energy management. Research to quantify the benefits on a geographic basis as well as across the energy value chain would greatly assist cost effective deployment of Smart Grid technology and investment on behalf of the energy consumer.*