



Smart grids: bridging the knowledge gap

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In 2007 and 2009, IBM released the results of its first and second Global Utility Consumer Surveys. In the first survey, the focus was on what consumers would want from a future relationship with providers that leveraged smart meters and the information they could make available. Based on the results in 2007, IBM was able to categorise residential energy customers based on their goals and on important factors such as environmental concerns, financial considerations, and convenience. The 2009 survey showed persistence of these distinct patterns of interest in new ways to control energy usage and interact with providers, but in a drastically different economic environment which reduced willingness to spend to achieve specific goals. In the past few years, however, consumer resistance was greater and engagement was less than some had expected as new technologies rolled out in markets around the world, and this shaped some of the questions devised for our 2011 survey.

For 2011, the survey scope was expanded to 15 countries, approximately 10,000 responses, and nine languages. To investigate the sources of possible attitudinal shifts, additional questions centred on what consumers' views and expectations are as smart meter programmes are deployed, experienced personally, and covered in the media – rather than focused on what consumers might want in the future.

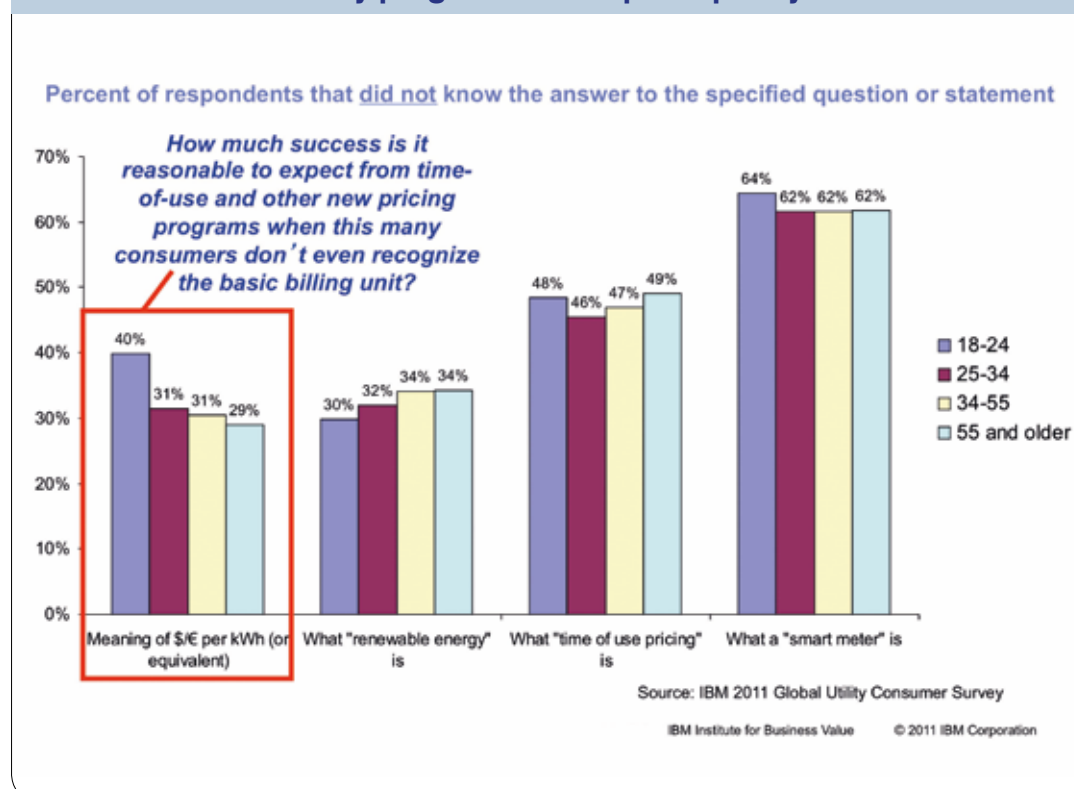
Knowledge gaps – bigger than assumed?

The survey results clearly indicate that there are major gaps in electricity consumers' knowledge, even for basic concepts. For example, when asked if they understand the basic pricing unit for consumption (i.e. cents per kWh), over 30 per cent of consumers report that they have never heard of the unit or do not know what it means. This has major implications for the implementation of programs like time-of-use pricing (a term itself which half of those surveyed do

not recognise at all). Over 60 per cent don't know what "smart meter" and "smart grid" mean; and "customer energy portal" has no meaning to 80 per cent. (See Figure 1.)

The results show that consumers' knowledge strongly correlates with both willingness to change behaviour to meet societal goals (e.g., help reduce peak demand by changing the time when energy is used) and with overall approval of smart grid programmes that are being deployed or proposed locally. For example, among consumers with very little knowledge of common industry terms, only 43 per cent approve of technology deployment

Figure 1: Major knowledge gaps exist across all age groups that could hinder industry progress toward participatory networks



programmes, versus 50 per cent for those with moderate knowledge and 61 per cent with strong knowledge. Similar correlation can be seen in responses to questions about whether these programmes will benefit their families and if they are likely to change energy use patterns. For virtually all measures of a consumer's likelihood of embracing changes, this stepwise, increasing pattern appears. (See Figure 2.) The good news is that greater consumer knowledge of smart grids correlates with higher levels of approval; the bad news is that almost half of consumers lack even basic knowledge.

Shifting perceptions and influences

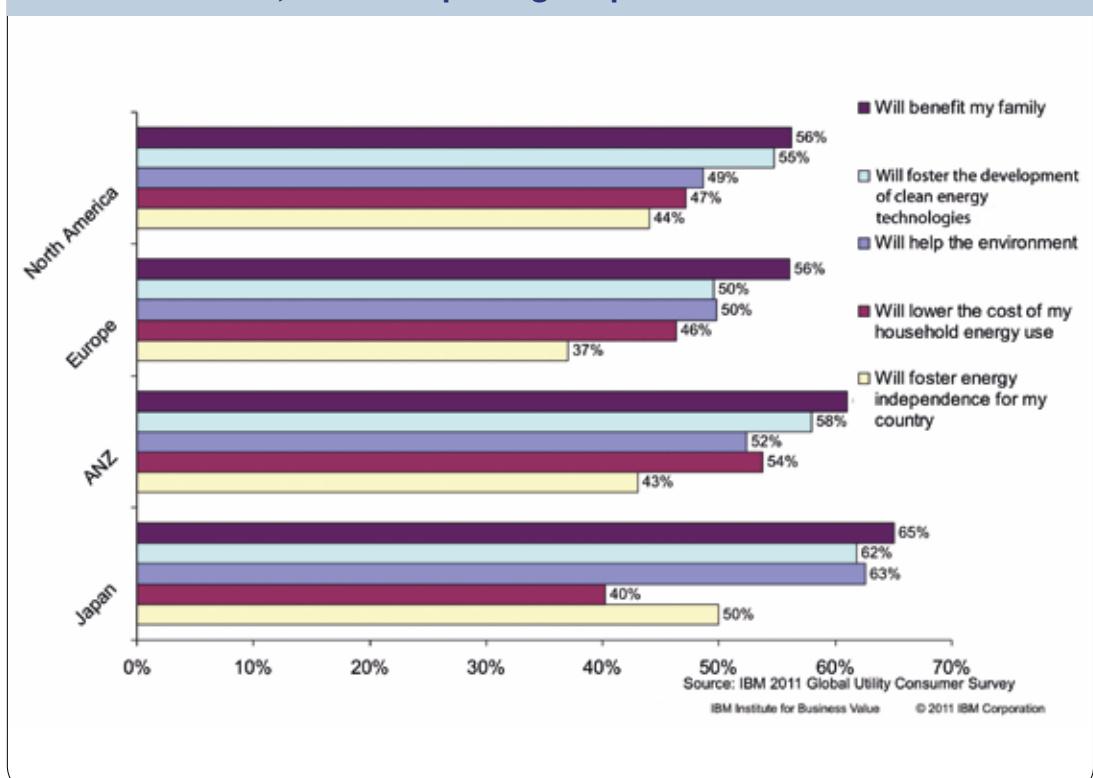
What, then, are the best ways to reach consumers to improve their knowledge? As one would expect, the responses show significant distinctions among age groups in how information is obtained. Online social networking and video content are as much as nine times more likely to be a primary information source for those under 25 than for those over 35. Those under 25 are also looking for information "close to home," being three times more likely to rely on friends and family as their first source, than on government sources. Those over 55 are only half as likely to look to their own personal contacts as to government sources.

Another factor that shifts across age groups is the nature of messages most likely to resonate. Although, as in prior years, saving money is the strongest motivator, the impact of other motivations is growing. Among younger consumers – particularly those

under 25 – the influence of environmental concerns is much higher. Conversely, those over 45 are up to 40 per cent more likely to be driven by concerns related to cost control, energy independence, and the impact of energy prices on the national economy. There are similar differences across countries, as well, some representing significant shifts from 2007 and 2009. In about half of the countries surveyed, motivations for changing energy consumption behaviour are driven less by the desires to conserve natural resources and lessen impact on the environment than by concerns about energy independence and the nation's economic health.

The most significant finding about messages and influences, however, comes from looking at the aggregate contribution of sources which have significant external influence on consumers' knowledge and perceptions. In this year's survey, the percentage of people reporting that they use an information source that is not under

Figure 2: Consumers believe the promise of smart grid and smart meters, and are expecting the promise to be fulfilled



the control of the consumer's provider exceeds the percentage that use a source directly under the control of that provider. This points to a major shift in messaging power. Consumers are now relying less on information that comes from their own energy provider and more on other external influences. The effect increases when looking at the emerging economies, and is stronger for younger consumers than for older ones. These findings seem in line with the explosion of social media and the diffusion of information and opinion via the Internet that are changing the way companies in almost every industry engage their customers.

Behavioural levers

Last year, experts in consumer decision-making from IBM and academia examined energy decision-making processes through the lens of behavioural economics. Often, industry advertising campaigns focus strongly on a particular long-term impact that smart meters and smart grid technology may have on the individual, typically in terms of costs, environmental impact, reliability, or reduced dependence on non-domestic energy sources. These core themes vary from geography to geography, but are often deployed across a broad media spectrum. This strategy is often less effective than distinct messages targeted at audiences for a specific medium. Price levers (such as time-of-use pricing) can drive changes in consumer behaviour, but at a risk of sometimes seeming driven by penalties ("I am paying more for this") and not by incentives ("I am choosing to do this"). If the relative weight of cost in decision-making continues to decline among key segments of the population, then understanding and addressing the additional factors that motivate consumers seems critical to succeeding in changing behaviour.

This does not, however, mean that options should be provided to address every priority suggested by all the various consumer segments. Aside from the expense and contradictions inherent in trying to do so, the resulting complexity would be likely to de-motivate consumers completely. In fact, the survey results showed that friends and family – especially for the youngest utility customers – are increasingly seen as the preferred source to identify best choice among options. Behavioural economics suggests (and experience has demonstrated in multiple areas) that, when faced with what they perceive as too many choices, people are more likely to lean on

the recommendations and choices of such preferred sources, rather than sort through options on their own. By presenting a more limited, but well-balanced set of options, energy providers can avoid the kind of complexity that can confuse people and stifle their desire to make independent choices.

Tapping into people's inherently social nature is one way to encourage the adoption of new ideas. "Social proof," or the behaviour of others, is a critical determinant in how people react to unfamiliar situations. This is the key idea behind new concepts such as Web portals that allow consumers to compare their energy usage to that of their neighbours. Being able to make comparisons also taps into the instinct many people have for competition. For utility service providers such as Enemalta Corporation and Water Services Corporation in Malta, the portal is instrumental in encouraging consumer action and lowering overall usage.

Conclusion

There appears to be insufficient understanding that to maximise the benefits of smart grids and smart meters, consumers will need to take a more active role in managing their energy consumption. This lack of understanding leaves the marketplace ripe for confusion and misinformation – and is exacerbated by factors such as people's growing tendency to get information about smart grids from sources other than the utility itself and the decrease in relative importance of price as a motivation to change consumption. To counter this lack of understanding – and the lack of support that is correlated with it – utilities and other advocates for smart grids need to engage consumers with (segmented) messages that address their specific motivations, and do so through the trusted channels

(such as friends and family, for younger consumers) they already use. One place to begin could be to find terms that are more intuitively understood by consumers: for example, more than half of consumers don't know what "time-of-use" pricing means in the domain of electric power, but the vast majority already understands the same concept when applied to the domain of mobile phones. Since many of the broader societal shifts echoed in the findings of the Global Utility Consumer Survey are already affecting many other sectors, it seems likely that many of the same marketing techniques being used in industries with longer traditions of direct consumer engagement could also help address the very real knowledge gaps for smart grids. 