Current On-Campus Attitudes toward Energy Usage, Efficiency, and Emerging Technologies

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Disclaimer

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Image downloaded from
http://ge.ecomagination.com/smartgrid/preview/images/GE_Scarecrow_Still.jpg

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Funding Information and Note

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Outline

- Context & Background for Energy Survey
- Methods & Survey Overview
- Respondent Demographics
- Results
  - Demand Response
  - Current Environmental Comfort Perceptions
  - Smart Meters
  - Perceived Smart Meter Benefits
  - Motivators of Energy Efficient Practices
- Summary & Implications

Context for Energy Attitudes Survey

- **Smartgrid is coming…**
- **How & to what extent would end users utilize emerging technologies, like smart meters.**

https://maps.google.com/maps/ms?ie=UTF8&hl=en&msa=0&msid=115519311058367534348.0000011362ac6d7d21187&ll=53.956086,14.677734&spn=23.864566,77.519531&z=4&om=1

Methods

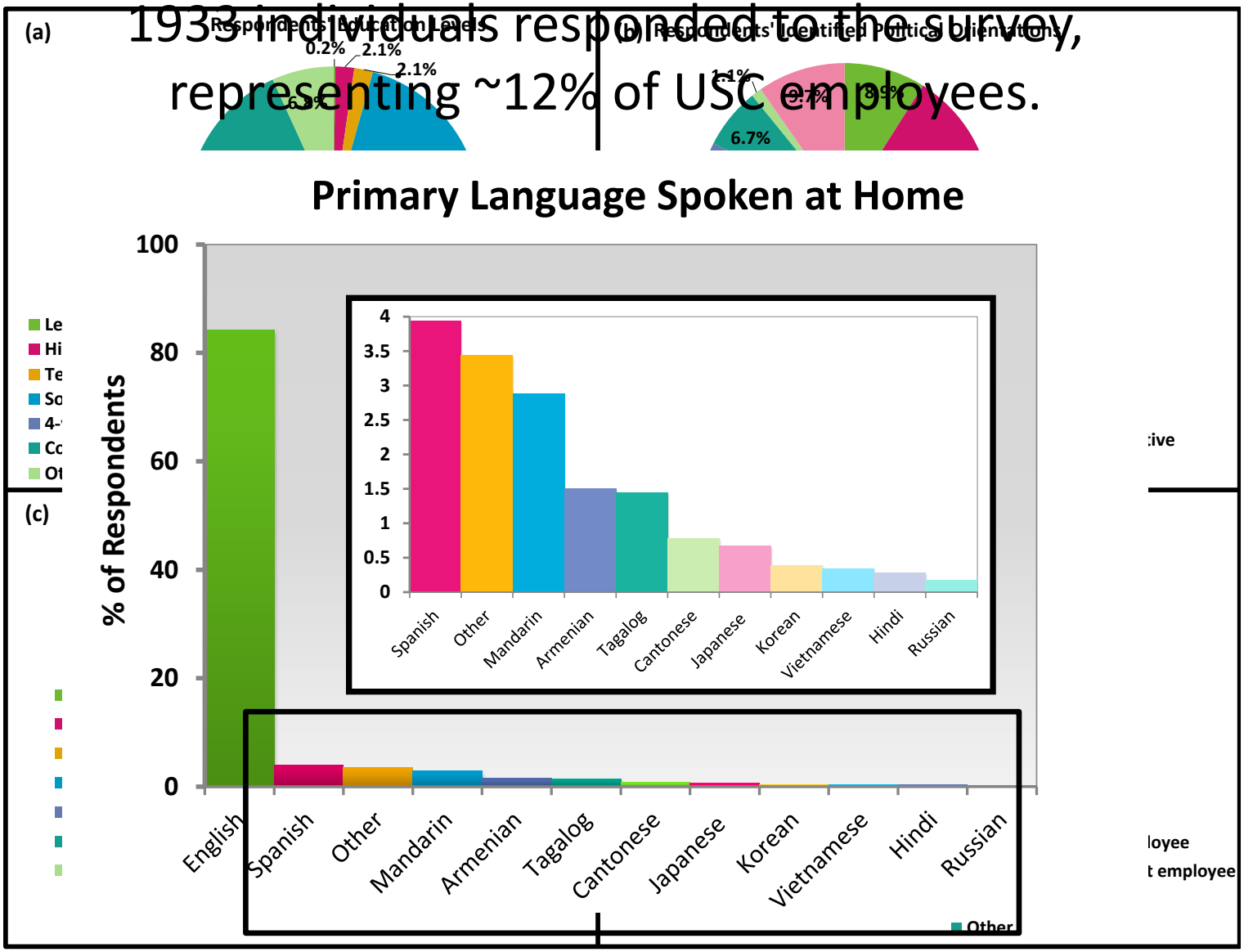
- In spring 2012 - recruitment letters sent via email to all employees of the University of Southern California (USC) inviting them to participate in an online survey with questions related to energy use preferences.
- Survey administered using Qualtrics, a secure, online software survey platform.
- Survey available 24 hours per day, 7 days per week from Feb. 16, 2012 til Apr. 15, 2012.
- To be eligible, respondents had to be USC employees at least 18 years of age.
- To increase participation rates & minimize sample bias, 3 $100 gift cards to popular chain retail stores were raffled off as compensation for participation.

Sample of Survey Topic Areas

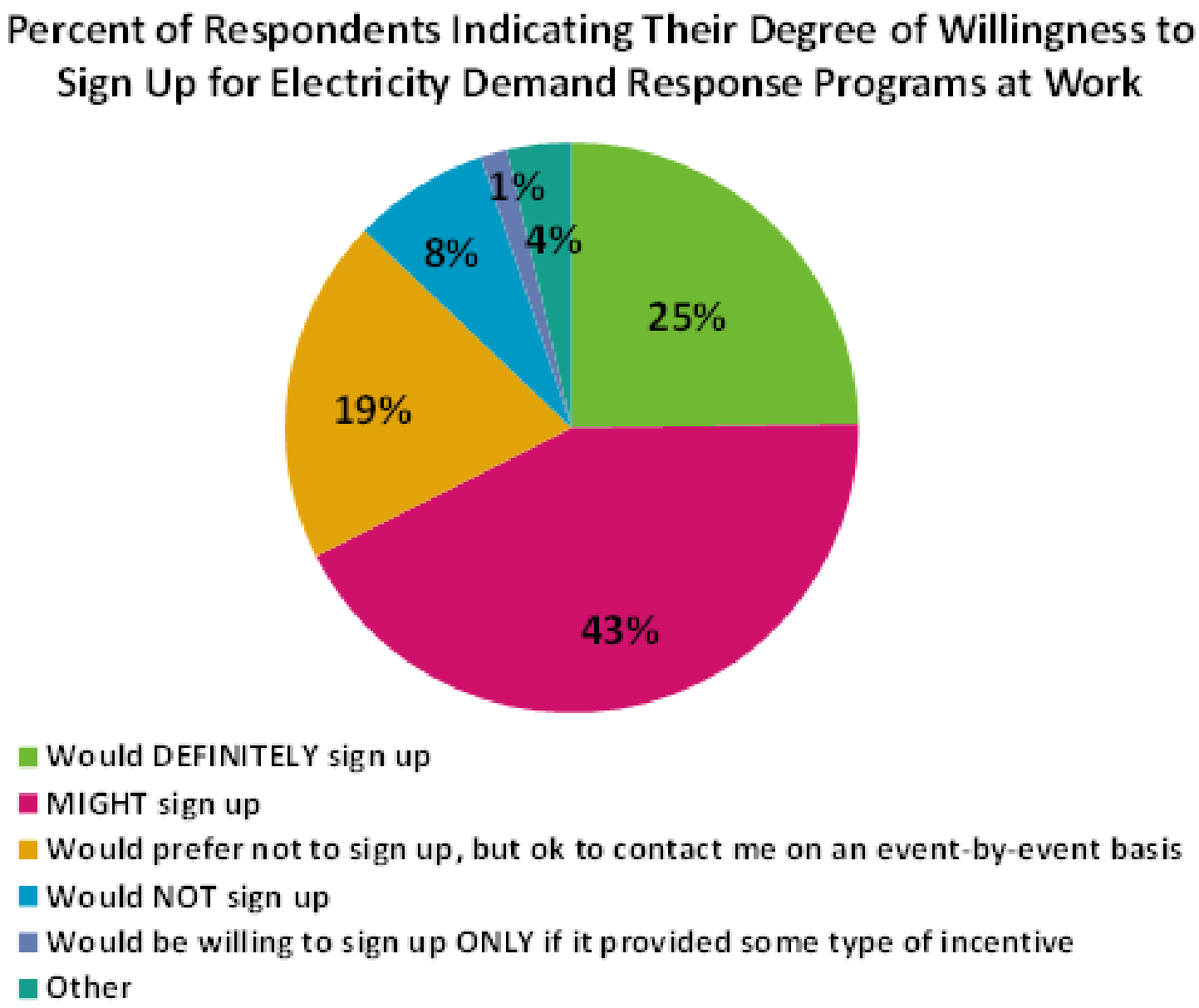
- Respondent Demographics
- Participation in Demand Response
- Current Environmental Comfort Perceptions
- Smart Meters
- Perceived Smart Meter Benefits
- Motivators of Energy Efficient Practices

Respondent Demographics

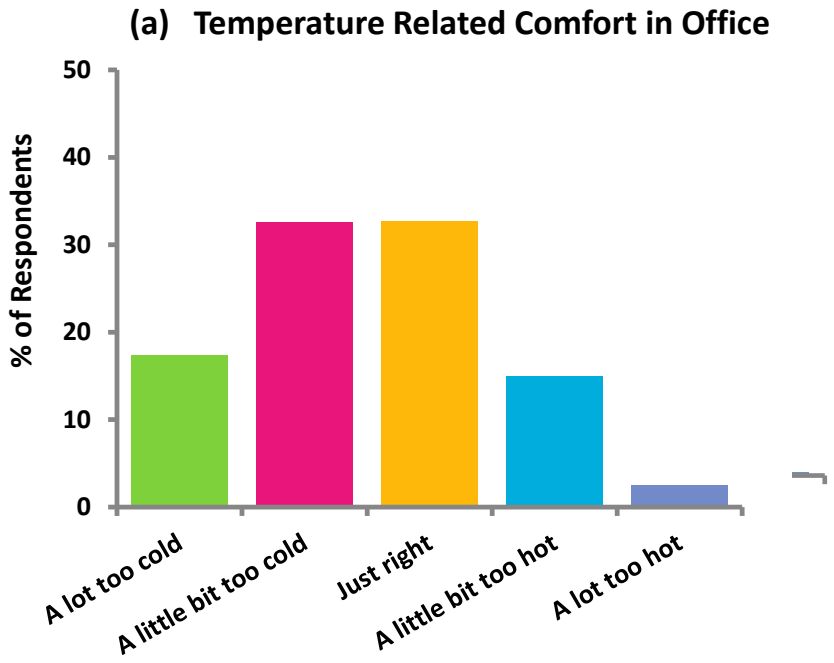
1933 individuals responded to the survey, representing ~12% of USC employees.

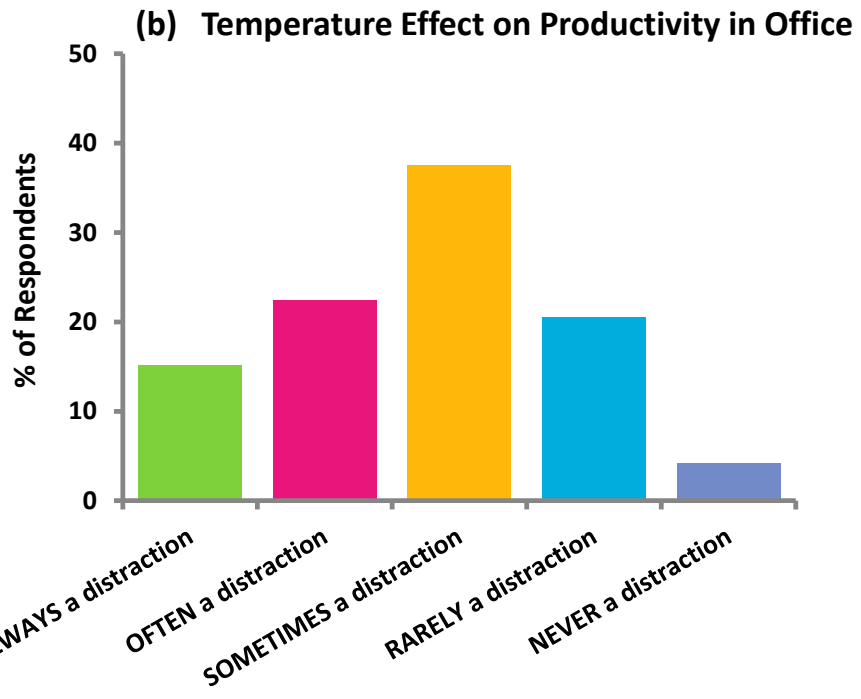


Results (Demand Response)

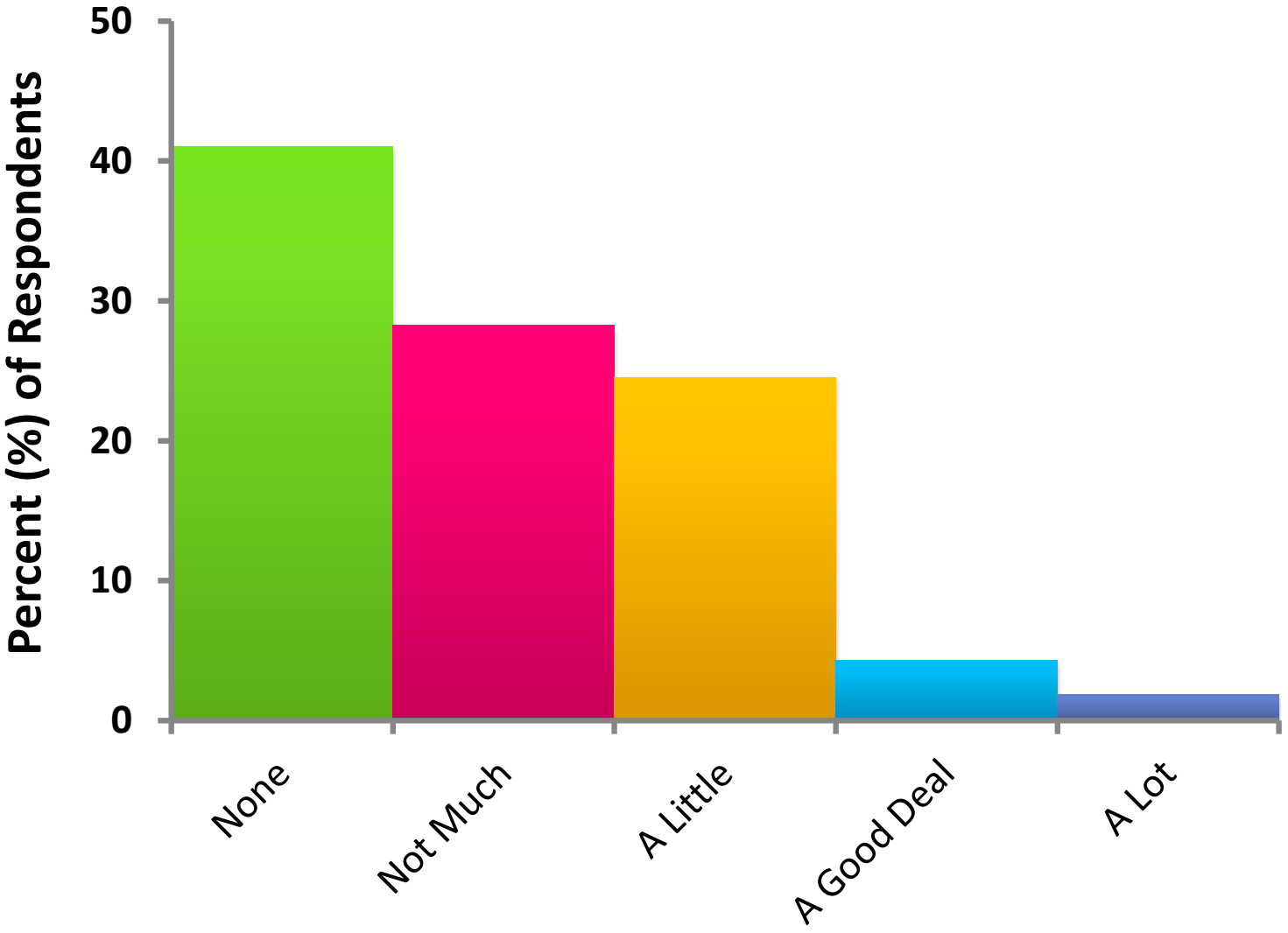


Results (Current Environmental Comfort Perceptions)

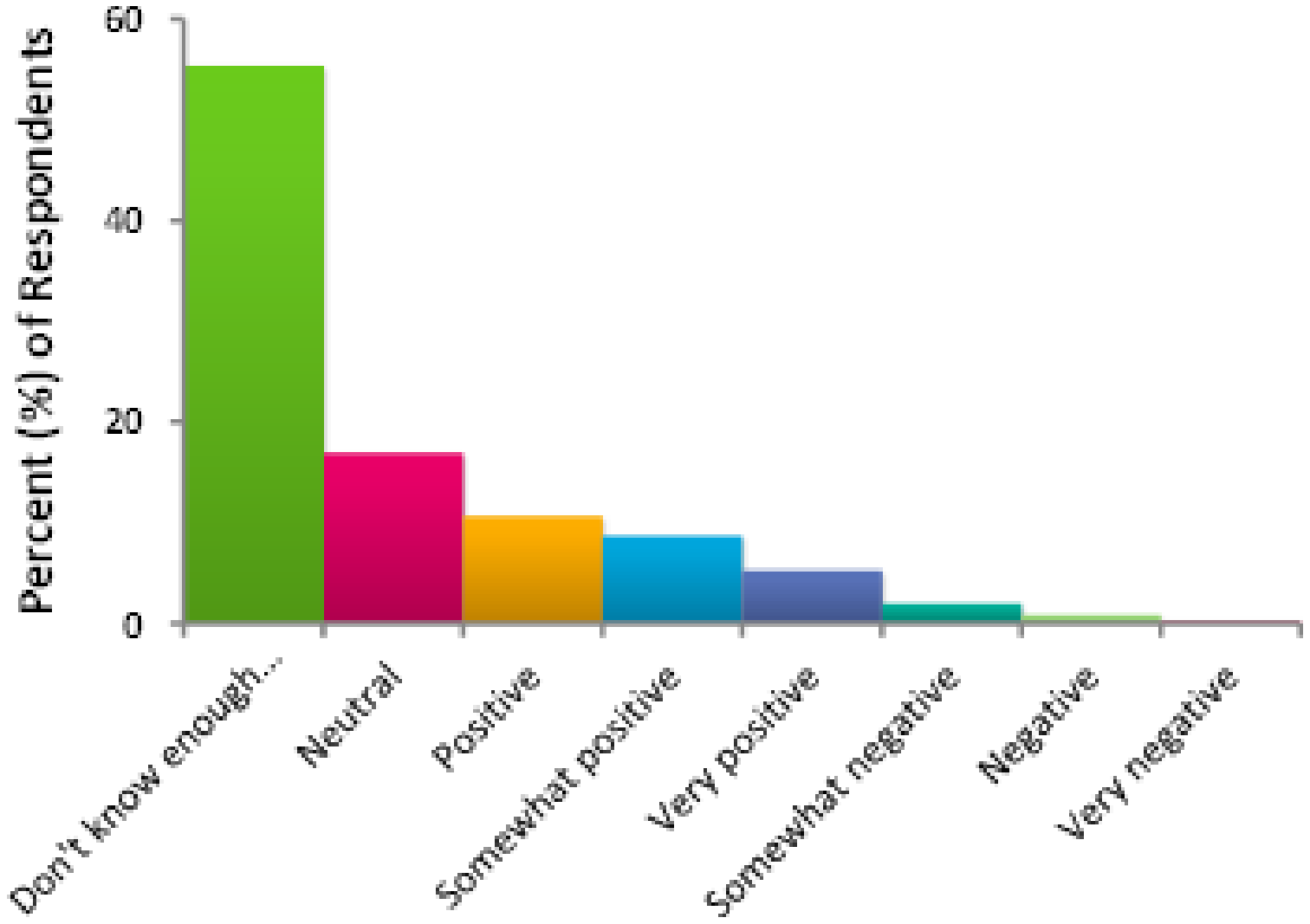




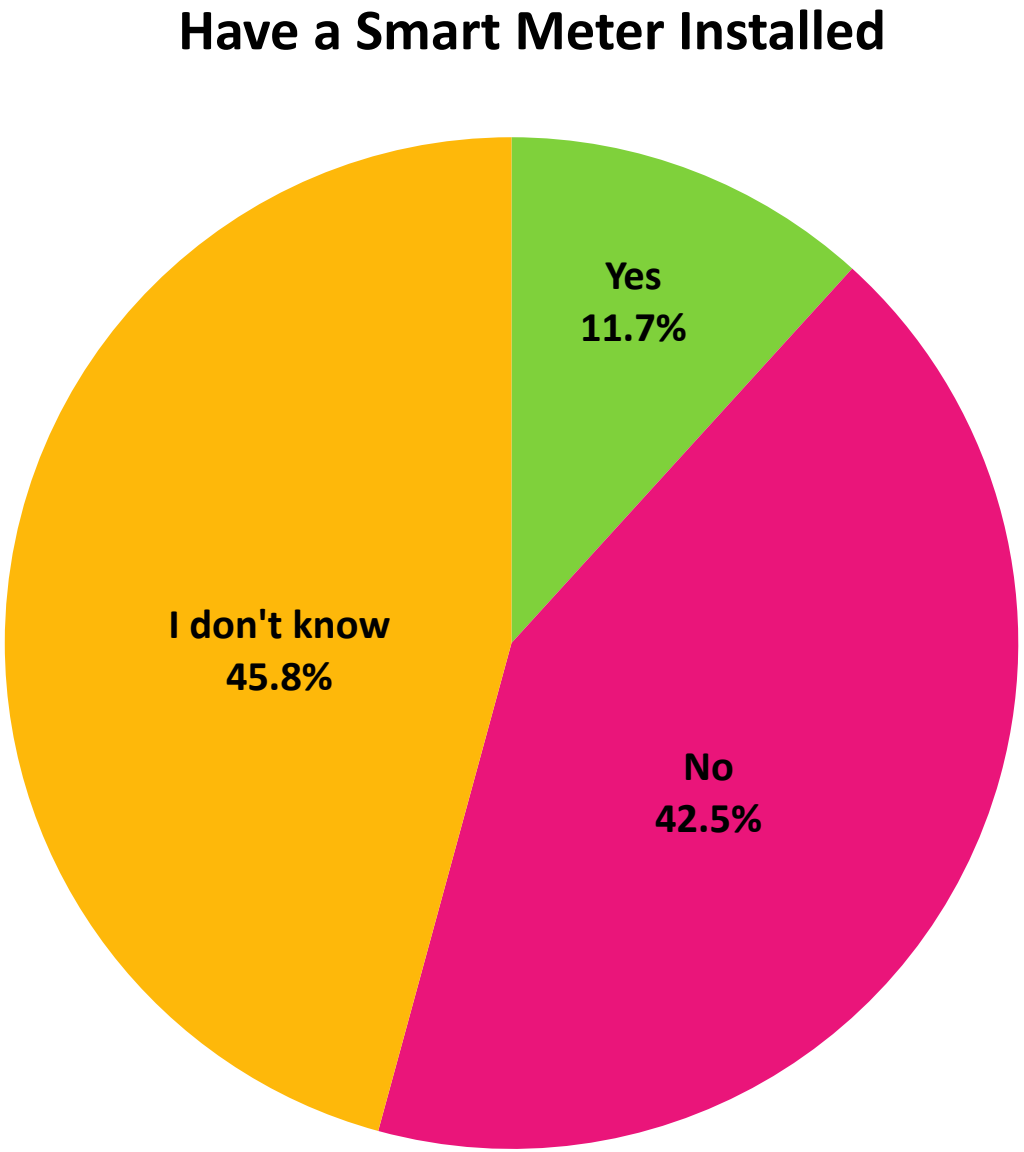
Results (Smart Meter Awareness)



Results (Smart Meter Opinions)



Results (Smart Meter Installed?)



Results (Adoption of Energy Efficiency Practices)

Mean score and standard deviation (SD) for adoption of energy efficient practices (rated on a scale of 1 (strongly disagree) – 5 (strongly agree))

Practice	Mean (SD)
Buy energy efficiency appliances	4.16 (0.74)
Interested in checking out new ways to save energy	3.98 (0.65)
Use appliances at off-peak times	3.59 (1.09)
Tend to use new technologies/devices	3.00 (1.04)
Tend to know about new ways to save energy	2.96 (0.94)
People in my social environment make me feel I should adopt energy efficient behaviors	2.77 (0.99)

Results (Efficiency Motivators)

Proportion of respondents that ranked motivators 1st, 2nd, or 3rd

Motivator	**%**
Environmental quality could benefit	62.95
Promote US energy security	48.15
My family could benefit	42.93
It is the right thing to do	40.78
My health/health of others could benefit	35.49
My economic well-being could improve	30.13
Well-being of economy at large could improve	15.94
My quality of life could improve	14.20
Aligns with my religious values	7.25
Friends, family, or colleagues engage in energy efficiency	1.60
Friends, family, or colleagues would like it	0.42

Summary and Implications (I)

- With respect to office environments:
  - 60% indicated that lighting conditions had little to no impact on their work productivity.
  - 70% of respondents indicated they were too cold (50%) or too hot (20%) at work.

- 75% of respondents further indicated that the temperature was at least sometimes a distraction at work.

- One potential mechanism for improving energy efficiency and temperature related comfort is to use a higher set point for the temperature during cooling seasons.

Summary and Implications (II)

- Despite the educated sample, most (approximately 65%) reported no or not much awareness of smart meter technologies.
  - Majority (55%) also indicated that they did not know enough about smart meters in order to form an opinion on them.
  - Despite low smart meter awareness , respondents still identified the perceived benefits of smart grid systems.
- Respondents identified the key benefits of a smart grid system as those relating to outcomes realized by other energy efficiency practices, namely protection of the environment via reduced energy generation and in turn decreased reliance on fossil fuels and reduced greenhouse gas emissions.
- They also identified better integration of renewable energy sources as another major benefit of a smart grid system.

Summary and Implications (III)

- Findings suggest that smart grid and smart meter awareness campaigns should continue to emphasize the pro-environmental benefits of smart grid system implementations.

- To encourage the adoption of energy efficiency practices at work & the future adoption of smart grid related technologies both at work & in the home, the top motivators:
  - information on the benefits of increased energy efficiency for a cleaner environment
  - independence of US energy generation, i.e. minimized reliance on foreign supplies of fossil fuels
  - benefits to families

  should be integrated into any energy-efficiency related awareness campaigns.

Conclusion

Overall, the low level of smart meter awareness means a large opportunity exists to inform those that have not yet heard enough info on smart meters & smart grid related technologies to formulate an opinion.

In order for smart grid systems to be successfully implemented & utilized by the general population, it's essential to increase smart meter awareness & communicate the benefits of smart grid systems in alignment with key motivators and perceived benefits.

From: http://www.afrea.ab.ca/smart-grid

Thank You