2018 ELECTRICAL CONTRACTOR PROFILE STUDY
TOPLINE REPORT

PREPARED BY:
RENAISSANCE RESEARCH & CONSULTING, INC

PREPARED FOR:
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BACKGROUND and PURPOSE

For over fifty years, ELECTRICAL CONTRACTOR magazine has sponsored its exclusive "Profile of the Electrical Contractor." This survey is conducted biannually among its subscribers and aims to provide the most complete "picture" of the contracting industry available from the electrical contractor's point of view. The survey provides electrical contractors with an indication of where their business "fits" into the overall industry, while at the same time providing information that is used to guide and refine the magazine's editorial content.

METHODOLOGY

The survey was conducted by postal mail and via the Internet among a random sample of ELECTRICAL CONTRACTOR subscribers. The field period for the survey began on March 7, 2018 (for both the Internet and postal mail versions), and ended on April 3, which was the deadline for the July 2018 article. A total of 1597 interviews were completed – 901 via the Internet and 696 via postal mail. The data were weighted to equalize the influence of the two modes so that it was in line with the 50/50 split which was the case in the most recent Profile studies.

Each respondent who received the survey via the Internet was sent two follow-up e-mails. However, follow-up mailings were not made to non-responders in the postal mail sample. An incentive was offered for participation in the survey: For each completed survey, ELECTRICAL CONTRACTOR magazine would contribute $5 to charity, up to a total of $10,000. For the first time, the magazine also offered a sweepstakes drawing for one of five $150 Amazon e-gift cards

The Internet option was first introduced in 2004. In 2004 and 2006, the proportion of surveys completed via the Internet versus postal mail is approximately 60/40. Since 2008, the proportion has been closer to 50/50. As noted above, in 2014, the data were weighted to equalize the proportion that participated via postal mail and via the Internet.

As was the case since 2004, the survey was produced in different versions. Starting with the 2008 Profile study, there were four versions of the survey, which differed from each other on fewer than 10 questions. The first 3 pages were common to all versions while the differences among the versions occurred on the last page. The major difference was that in the Internet portion respondents were *required* in almost all cases to have percentage questions add to 100%.

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This research was conducted by New York, NY-based Renaissance Research & Consulting, Inc. (www.renaiss.com), an independent marketing research firm that has, as one of its specialties, market research for the construction industry.

METHODOLOGY, Continued

In 2014, order to accommodate a longer list of questions while at the same time lessening the burden on the respondent, the survey was shortened from 5 print pages to 4. In order to accommodate all of the questions, the survey was produced in 8 versions (up from 4). This required a much larger sample size so that each of the questions would be asked of a large enough sample to allow for analysis – particularly by subgroups. In 2016, there were 7 versions; the two versions that deal with training (past 12 months and next 12 months) were combined. In 2018, there were also 7 versions.

In the 2018 Profile Study, for the first time, we also identified Subscriber Panel members who participated in the study as part of our random email survey invitation and also separately solicited Panel members to participate in the Profile survey by mailing them a separate survey link. In total, 117 Panel members participated in the Profile Study

Statistics

The margin of error on the total sample of 1597 is +/– 2.1% for percentages around 50 percent (i.e., we are confident that a reported 50 percent will fall between 52.1 percent on the plus side and 47.9 percent on the minus side 90 percent of the time.) Please note that different rules apply to testing of averages, which were also tested at the 90 percent level of confidence and are noted in the report.

A significant difference in the total sample between 2018 with a sample size of 1597 and 2016, where the sample size was 2419 is at least 2.7% at the 90% confidence level.

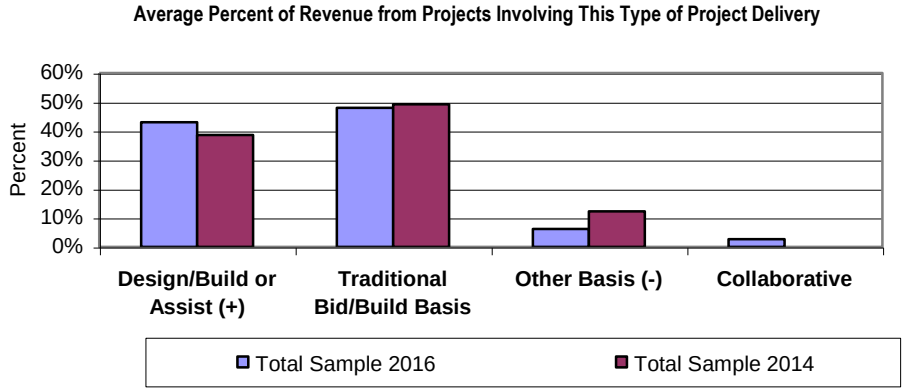
The report uses a few different graphics to indicate significant differences:

- In this example, the electrical contractors working in firms with 1- 4 (column ‘a’) or 1-9 employees (column ‘b’) are significantly older than those who work in firms with 10+ employees.

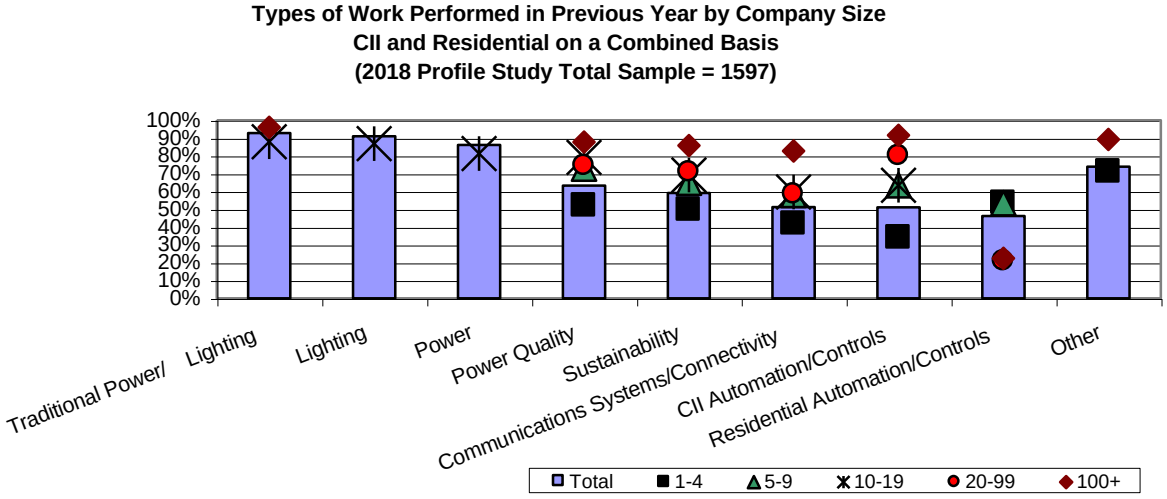
Average Age of Electrical Contractor in 2016 and Earlier				
		Firm Size		
	Total	1-4	1-9	10+
		(a)	(b)	(c)
Average Age (2016 Study) N=2419	57.3	**58.7>c**	**58.5>**	54.1
Average Age (2014 Study) N=2722	56.2	57.4	**57.1>**	53.3
Average Age (2012 Study) N=1024	56.1	57.5	**57.2>**	52.6
Average Age (2010 Study) N=1077	53	53.8	**53.8>**	50.4
Average Age (2008 Study) N=1157	51.2	**52. 6** >c	**52. 1**>c	49.2

The bolding and the arrow indicate significant difference and the direction of the difference.

Finally, on a column or bar chart, a (+) or (-) next to the title indicates a significant difference compared to its pair. In this example from the current study, the average revenue from Design/Build or Assist rose significantly vs. two years earlier.



How to read scatter plots: Subgroups that are shown above the blue bar are significantly larger than average while those within the bar are smaller than average. Subgroups that are average are not shown.



KEY FINDINGS

Electrical contracting firms appear to be continuing to stabilize or improve on the positive trajectory identified two years ago.

- As has been the case in the recent past, about 70% of firms have 1-9 employees and annual revenues of under $1 million. This is statistically unchanged compared to two years ago.

- The percent of electrical contracting companies that are losing employees, once again, has declined significantly from 13% two years ago to 9% in the most recent study. In 2010, 36% of firms reported having lost employees.

- 52% say that they are extremely or very confident in the growth of the economy over the next few years. An additional 36% say that they are somewhat confident in the economy's near-term growth. That makes a total of 88% with a positive outlook. We believe that confidence, in turn, spurs investment in goods, services and personnel.

- There is evidence that electrical contractors are continuing to move away from standard power and wiring to higher tech and more value added areas such as Lighting.

    - In fact, in the current wave, only about 25% of revenue now comes from Electric Power Transmission and Distribution, down dramatically and significantly from 43% just two years ago. As recently as 2004, the percentage from Electrical/Power Distribution was 69%.

    - In contrast, average revenue from Lighting increased an impressive and statistically significant 8 percentage points while average revenue from Communications Systems, Building Systems Integration and Building Automation Control Systems each rose an average of about 2% each.

- Maintenance/Service and Repair was explored more extensively in the 2018 Profile Study. What we found is that on average, 70% of electrical contractors of all sizes perform this type of work and that it accounts for an average of 41% of revenue.

    - On average, 33% of revenue comes from new construction and 29% from modernization/retrofit. The importance of maintenance service *contracts* to revenue increased significantly compared with two years earlier.

- While electrical contractors are continuing to work in Traditional Power/Lighting in strong numbers: (91% Lighting and 86% Power) an equal percentage -- 95% -- work on low voltage projects. In addition, high percentages are doing HVAC work (40%), including HVAC Controls (34%) as well as HVAC Mechanical (22%). 13% have worked on Water Utilities or Waste Water Treatment Plants.

    - 18% said that their 2017 work involved Pre-Assembly/Prefabrication of Electrical Components and 15% said that they performed Programming and Commissioning in the previous year.

- Given the complexity of some of these projects, it should not be surprising that 47% of electrical contracting firms have a professional relationship with an engineer – either on a consulting basis (42%) or on staff/ in a separate division (13%) or both consulting and on staff/separate division (8%).

- As was the case two and four years ago, smaller firms are continuing to do types of work that were formerly done by larger electrical contacting firms. The threshold for many types of work now appears to be 5+ employees rather than 10+ or rather than 20-99 or 100+. In fact, when reviewing 42 project types across CII and Residential construction, firms with 5-9 have a profile that is much closer to firms with 10-19 employees than to their smaller counterparts.

- However, the very smallest firms perform many aspects of Traditional Power/Lighting, Power Quality, Communications/Connectivity, Automation/Controls Systems and even HVAC Mechanical work; even including some Sustainability projects. Their widespread involvement only becomes evident when CII work (which tends to overshadow residential work) is excluded.

    - Firms with 5-9 employees are in a sweet spot, because, in addition to their above average work on CII projects, they also participate to a greater than average extent on Residential projects.

- All but the smallest firms (1-4 employees) are embracing BIM. While BIM usage and the average revenue from it is low among firms with 1-4 employees, it increases dramatically as firm size increases, often starting with firms as small as 5-9 employees. At its peak among firms with 100+ employees, 70% say that they use BIM at all (any use) and that on average, it is used on about one-quarter of their projects.

- "Availability" and "Price" continue to be the most mentioned reasons for original brand selection and for brand substitution. Fewer mention Price in 2016 compared to two years earlier.

    - Compatibility with Existing Systems, an attribute that was added in 2014 emerged as quite compelling – 32% to 37% among the total sample cite it as a top-3 reason for brand selection. This may be a hot-button for manufacturers if they can use it differentiate their products from competitors.

The average age of the electrical contractors participating in this survey is now 58.2, a statistically significant increase from two years ago when it was 57.3 two years ago.

Types of Work Performed in Previous Year

When asked about the types of work performed in the previous year (regardless of whether Residential or CII), almost all firms worked on Power and Lighting (93%).

- 91% perform Lighting
- 86% perform Traditional Power
- 72% work on Automation controls Systems
- 70% perform Maintenance/Service/Repair
- About 60% work on Power Quality and/or Sustainability
- 51% Communications Systems/Connectivity

Receipt of incomplete plans and specs continues to be quite prevalent. 73% of firms have received ANY incomplete plans and specs in 2017, statistically unchanged from two years earlier. On average, 42% of the plans and specs received were incomplete, statistically unchanged from 43% two years earlier.

As might be expected, the incompleteness of plans and specs varies dramatically by building category. It is highest in single-family construction and declines as the level of complexity increases.

As has been the case in recent Profile Studies, about three-quarters of electrical contractors report having a “high” or “medium” ability to influence the overall electrical design or specifications with building owners or design team members.

Brand Specification Options: Electrical contractors continue to have a high level of brand choice. As in earlier tracking waves, only about one-quarter of the specs indicate a single or proprietary brand, while the remainder are some variation of multiple brands.

DETAILED FINDINGS

▲*"WHO" ARE THE ELECTRICAL CONTRACTORS?*

Size of Firms

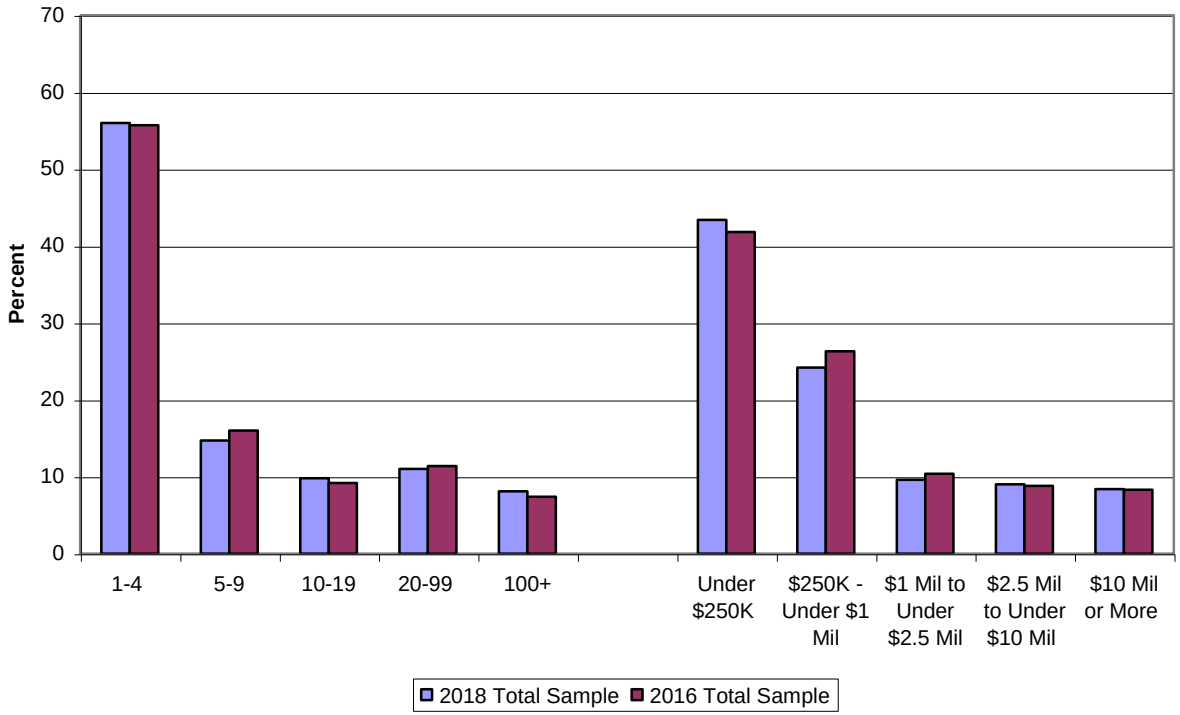
A large majority of the electrical contracting firms interviewed are small in terms of both their number of employees and their revenue:

71% have between 1 and 9 employees and 68% have annual revenues of less than $1 million, both are statistically unchanged compared to two years earlier. (In the 2016 Profile Study, the number of firms with 1-9 employees was 72% and 68% of firms had revenues of under $1 million).

In contrast, in the 2016 Profile Study, the percentage of smaller firms as a proportion of the total had declined from two years earlier, but this trend has not continued into the current wave.

The combined categories of 1-9 and Under $1 million are not shown

Company Size Trended 2018 Profile vs. 2016 Profile
(Reporting n Previous Year)

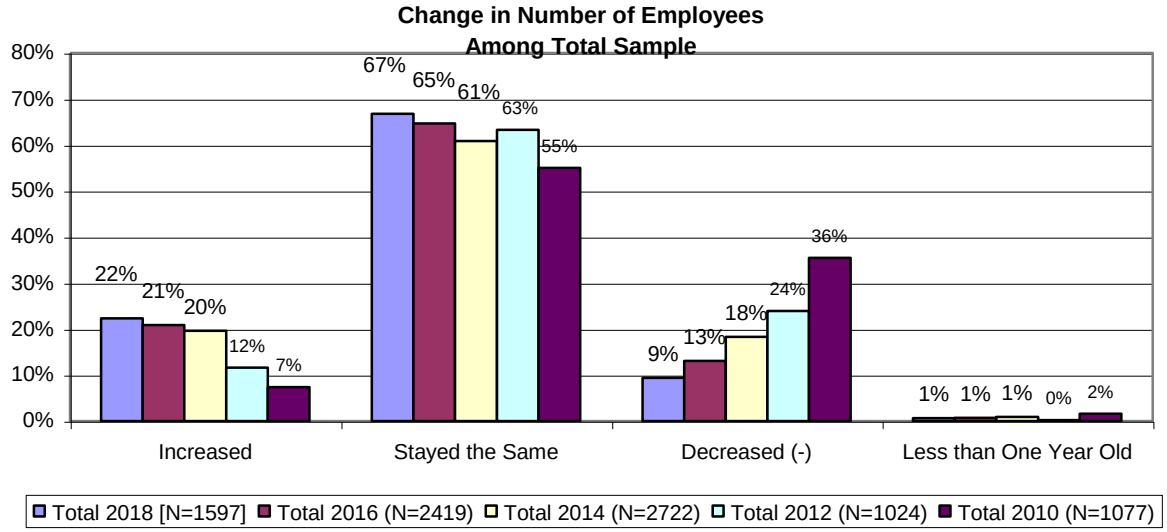


(-) and (+) indicate a significant difference from two years earlier at the 90% level of confidence

Change in Company Size During Past 12 - 18 Months

When questioned directly about changes in company size, as of the 2018 Profile Study, the percent that said that their firm "increased" is more than twice as high than the percent that "decreased" (22% vs. 9%), while about two-thirds said that their firm size had stayed the same over the past 12 - 18 months.

- Further, when the 2018 Profile Study is compared with the 2016 Profile results, there is, once again, a statistically significant *decrease* in the percentage of firms that said that they lost employees (9% in 2018 compared with 13% in 2016). However, there is no statistically significant difference in the percent of firms that increased the number of employees or in the percentage of firms that stayed the same.
    - Note the sharp, steady and continuing decline of firms that lost employees (decreased) between 2010 and 2018.



(-) and (+) indicate a significant difference from two years earlier at the 90% level of confidence

Change in Company Size During Past 12 - 18 Months, continued

As was the case two years ago, in 2018, firms with 10+ employees posted a significant increase versus two years earlier, while there was no statistically significant difference among firms with 1-9 employees or among the total sample compared with two years earlier.

- However, across the board – among the total sample as well as among firms with 1-9 and 10+ employees, the percentage of firms that lost employees declined significantly compared with two years earlier.

Change in Company Size During Past 12 - 18 Months																	
	Total						1-9 Employees						10+ Employees				
	2018	2016	2014	2012	2010		2018	2016	2014	2012	2010		2018	2016	2014	2012	2010
	(1597)	(2419)	(2722)	(1024)	(1077)		(1122)	(1744)	(2039)	(759)	(780)		(469)	(665)	(668)	(258)	(285)
Increased	22%	21%	**20%>**	**12%>**	7%		10%	11%	**12%>**	6%=	5%		**53%>**	**47%>**	**42%>**	**27%>**	15%
Stayed the Same	**67%**	**65%>**	61%=	**63%>**	55%		**80%>**	**75%>**	70%=	**72%>**	67%		36 =	38%	35%=	**37%>**	23%
Decreased	9%	<13%	**<18%**	**<24%**	**<36%**		9%	<12%	**<17%**	**<20%**	**<26%**		10%	<15%	**<23%**	**<35%**	**<61%**

Bolded numbers > and < indicate statistically significant differences in the direction of the arrow

Confidence in Near-Term Growth of the Economy

More than one-half (52%) of electrical contractors that were asked this question say that they are "extremely" or "very" confident in the growth of the economy over the next few years. An additional 36% said that they were "somewhat' confident" for a total of almost 90% who have a positive outlook.

- Electrical contractors in firms with 5-9 employees and/or those that added employees over the past 18 months are more likely to say that they are "extremely or very" confident in near-term economic growth.

- In contrast, firms with 1-4 employees and/or those that stayed the same or that decreased in size are less likely to say that they are "extremely or very" confident in near-term economic growth.

    - No other significant differences emerged. This question was first asked in 2018 and therefore cannot be trended.

	Confidence in Growth of the Economy Over the Next Few Years					
	Total	1-4	5-9	Increased	Same	Decreased
Version 5	(241)	(131)	(32)	(61)	(149)	(25)
	%	%	%	%	%	%
Extremely/Very	52	*46*	**<71**	**65>**	*50*	*41*
Extremely	16	*11*		**24>**	*13*	
Very	36		**51**			
Somewhat	36					
Not Very/Not At All	10			*4*	**<10**	**22**
Not Very	7	**10**				
Not at All	3					
Not Sure/No Answer	3					

Empty cells are not significantly different than the total sample

Annual Revenue

- 68% of firms have annual revenues of less than $1 million; 27% of firms have annual revenue of $1 million or more; 5% did not answer this question.

Number of Employees By Firm Revenue 2018 Profile Study								
	Total	(1-4)	(5-9)	1-9	10+	10-19	20-99	100+
	(1597)	(893)	(229)	(1122)	(469)	(157)	(178)	(134)
	%	%	%	%	%	%	%	%
Less than $ 1 Million	**68**	**94**	**76**	**90**	**12**	**24**	**9**	**0**
Less than $250K	43	72	13	60	3	6	2	0
Between $250K and <$1 Million	24	22	62	30	9	18	7	0
$ 1 Million or More	**27**	**0**	**22**	**5**	**80**	**67**	**86**	**89**
Between $1 Million and <$2.5 Million	10	0	20	5	21	48	10	5
Between $2.5 Million and <$10 Million	9	0	2	0	30	19	57	6
Between $10 Million and <$25 Million	3.5	0	0	0	12	.7	17	19
$25 Million +	5	0	0	0	17	0	1.5	59
Don't Know/No Answer	5	6	2	4	8	9	5	11

Q3 N=1597

Income distribution is unchanged vs. two years ago among the total sample. It had shifted upward between 2014 and 2016. Specifically, compared with 2014, in 2016 a significantly smaller percentage of electrical contractors worked for firms with revenue of under 1 million (68% vs. 72%) while a significantly higher percentage worked for firms that had revenues of $1 million or higher, but there were no changes during the past two year period across the total sample.

- The subgroups are shown for context only but have not been significance tested. This is because we have a concern that the question may have been misinterpreted or misunderstood. Otherwise, it is difficult to explain, for example, how a how firm with 100+ employees could have a yearly revenue as low as $2.5 million.

Number of Employees By Firm Revenue
2018 Profile Study Vs. 2016 Profile Study

	Total		1-4		5-9		10-19		20-99		100+	
	2018	2016	2018	2016	2018	2016	2018	2016	2018	2016	2018	2016
	(1597)	(2419)	(893)	(1361)	(229)	(383)	(157)	(223)	(178)	(269)	(134)	(173)
	%	%	%	%	%	%	%	%	%	%	%	%
Less than $ 1 Million	**68**	**68**	**94**	**95**	**76**	**73**	**24**	**29**	**9**	**4**	**0**	**0**
Less than $250K	43	42	72	71	13	11	6	3	2	2	0	0
Between $250K and <$1 Million	24	26	22	24	62	62	18	26	7	2	0	0
$ 1 Million or More	**27**	**28**	**0**	**0**	**22**	**22**	**67**	**69**	**86**	**91**	**89**	**85**
Between $1 Million and <$2.5 Million	10	10	0	0	20	20	48	48	10	15	5	4
Between $2.5 Million and <$10 Million	9	9	0	0	2	2	19	21	57	53	6	5
Between $10 Million and <$25 Million	4	4	0	0	0	0	.7	1	17	21	19	18
$25 Million +	5	5	0	0	0	0	0	0	1.5	2	59	58
Don't Know/No Answer	5	4	6	5	2	5	9	2	5	5	11	15

< Indicates a significant difference at the 90% level of confidence

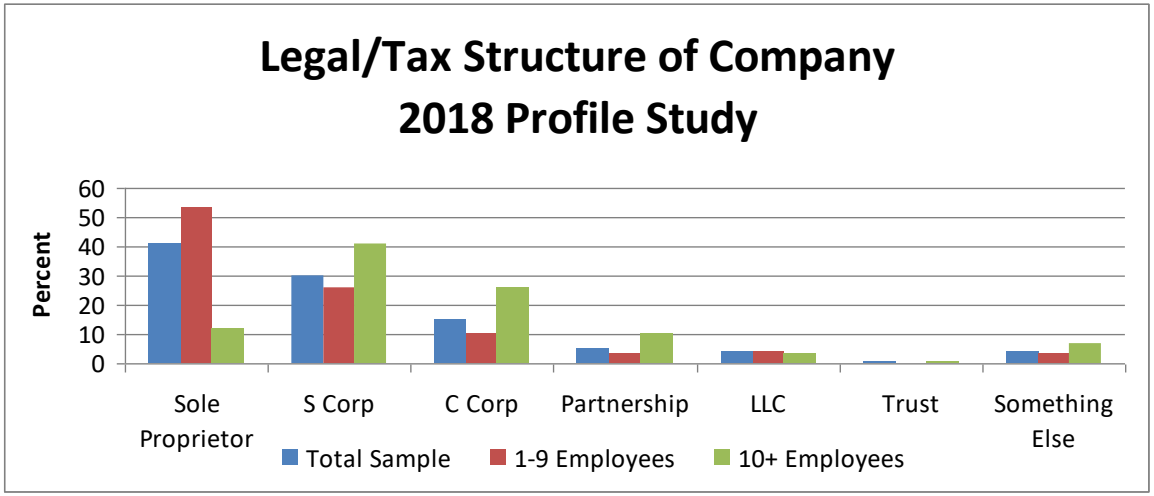
Other Firm Characteristics

(NECA Membership, Business Development, Tax Status and Number of Years in Business)

- 18% of firms in this survey are NECA members; this is statistically unchanged from the 2016 level of 19%. In a departure from two years ago, NECA membership is significantly higher among firms with 10+ employees (rather than 20+ employees). However, NECA membership still skews to larger firms.
    - NECA membership is 10% among firms with 1-9 employees but 37% among firms with 10+ employees. Further membership likelihood increases with company size:
        - NECA membership is 26% among firms with 10-19 employees; 32% among firms with 20-99 employees and 56% among firms with 100+ employees
- 16% of firms have a separate person or department responsible for business development, statistically unchanged from the 2016 level of 12%. Once again, having a separate division continues to be more prevalent among firms with 10+ employees (40%, up significantly from its 2016 level of 29% and back to the 2014 level of 41%). An additional 2.4% plan to create this responsibility which is a significant decline from the 2016 level of 5%. Further, in 2018, there is no significant difference between firms with 1-9 and 10+ employees on this measure, while in 2016 larger firms were significantly more likely than smaller firms to plan to set up a business development unit.

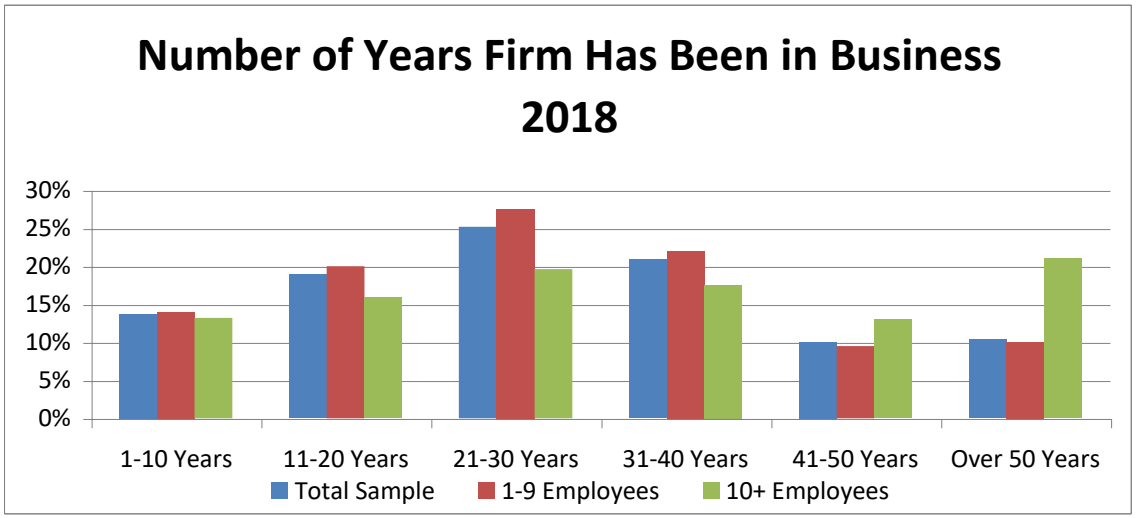
- Among the total sample, Sole Proprietorships (41%) are the most common form of legal organization, followed by S Corps (30%), C Corps (15%), Partnerships (5%), LLCs (4%) and then Trusts (.3%).

    - Sole Proprietorships are most common among firms with 1-9 employees (53%) followed by S Corps (26%). However, S Corps are also favored among firms with 10+ employees (41%) followed by C Corps (26%) and to a lesser extent, Partnerships (10%).



Larger companies are also more likely to have been in business for 50 years or more.

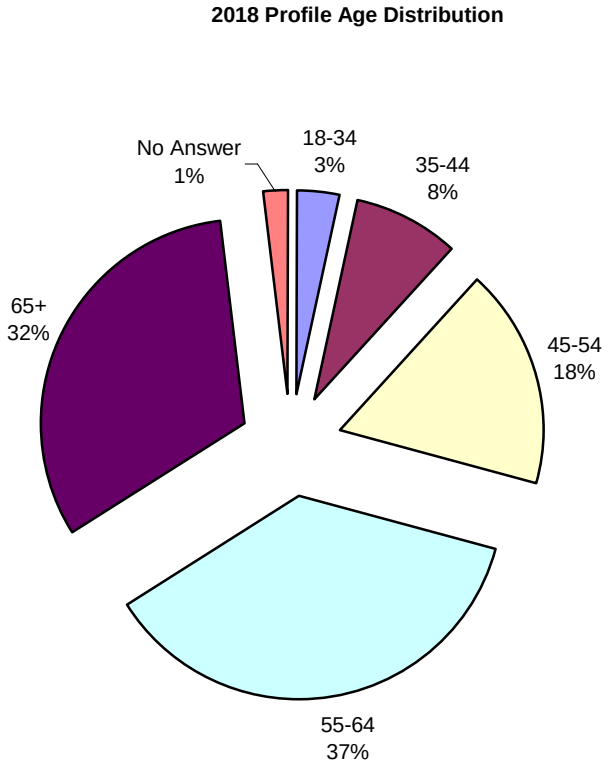
- On average, the electrical contractors' firms that participated in this study have been in business an average of 31 years (not shown).



"WHO" WORKS FOR CONTRACTING FIRMS?

Age of Respondents

Regardless of company size (number of employees), the survey respondents tend to be at least middle aged, rather than young. Across the total sample, only 3.3% are aged 18-34, 26% are between the ages of 35 –54, 37% are aged 55-64 and 32% are aged 65+.



The average age of the electrical contractors participating in this is now 58.2, a statistically significant increase from two years ago when it was 57.3.

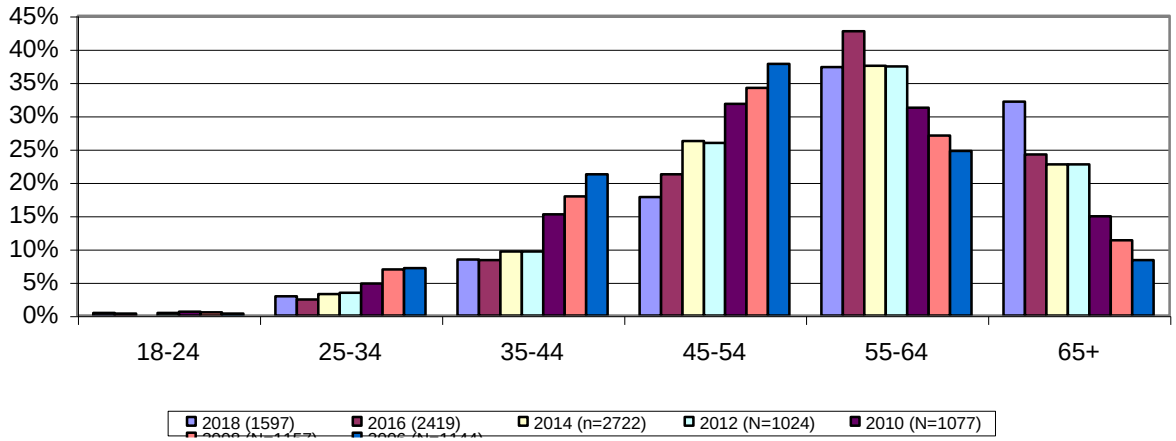
- As was the case two years ago, the average age also rose among electrical contractors in firms with 1-4 employees and with 1-9 employees -- indicated by (↑) -- but not among firms with 10+ employees.

- Also as was the case in the recent past, the electrical contractors in smaller firms are older than those in larger firms. One hypothesis is that older electrical contractors may found their own -- smaller firms -- after working for others earlier in their careers.

Average Age of Electrical Contractor in 2018 and Earlier				
		Firm Size		
	Total	1-4	1-9	10+
		(a)	(b)	(c)
Average Age (2018 Study) N=1597	58.2	60.6 (↑)	**60.0** (↑) **>c**	53.8
Average Age (2016 Study) N=2419	57.3	58.7	**58.5>c**	54.1
Average Age (2014 Study) N=2722	56.2	57.4	**57.1>c**	53.3
Average Age (2012 Study) N=1024	56.1	57.5	**57.2>c**	52.6
Average Age (2010 Study) N=1077	53	53.8	**53.8>c**	50.4
Average Age (2008 Study) N=1157	51.2	52. 6	**52. 1**>c	49.2

When looked at by age bracket, there has been a significant *decline* in the percentage of electrical contractors who are aged 45 to 54 (from 21.2% in 2016 to 17.8% in 2018) as well as a significant decline in the percentage of electrical contractors who are aged 55-64 (from 42.7% in 2016 to 37.3% in 2018) while the biggest jump is among electrical contractors who are aged 65+. That group experienced an 8-percentage point jump: from 24% to 32%.

Comparison of Age Composition Over Time

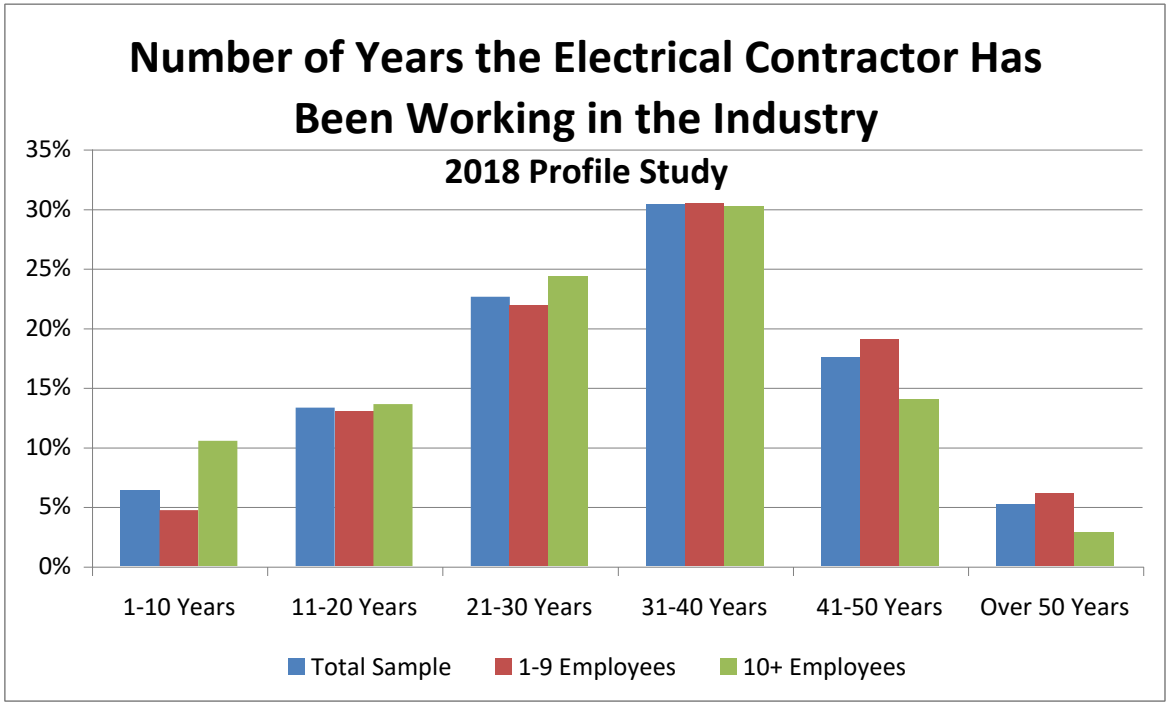


Number of Years in the Industry

Given the average age of the survey respondents, it is not surprising that they have been in the electrical contracting industry an average of 32.6 years. This is a new question and cannot be trended.

5% have been in the industry more than 50 years. This is more prevalent in firms with 5-9 employees (9%) and or in firms with revenues between $250k and $1 million (8%). These long-tenured individuals are least likely to work for firms with 20-99 employees (2%) or with revenues of over $1 million (range of 2.2% to 2.8%). [Breaks are shown only for firms with 1-9 and 10+ employees]

[Table 56; Section 57]



Respondent Education

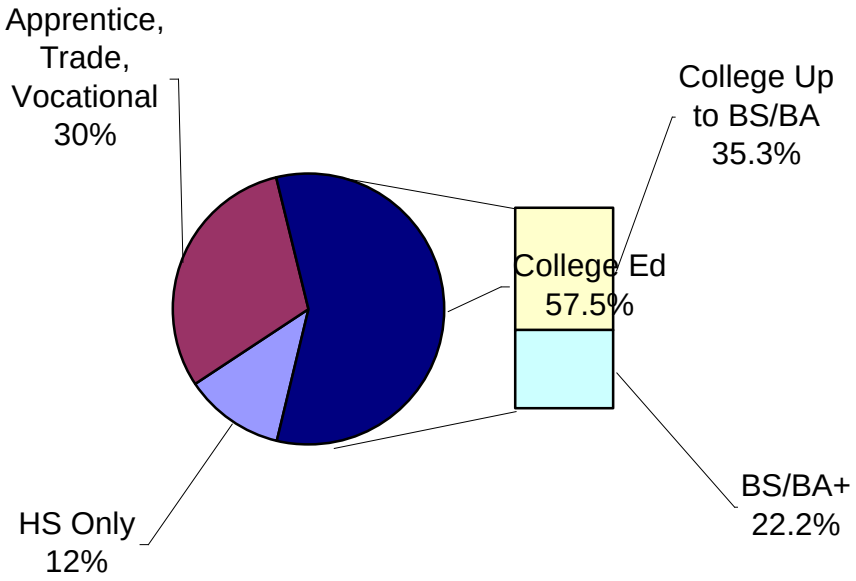
A majority of survey respondents --57.5% across the total sample -- have some college education. The findings among the total sample are consistent with those reported two years ago.

Those in larger firms (10+ employees) continue to be significantly more likely to have attended college than those in firms with 1- 9 employees (61% vs. 56%), particularly to hold a BA/BS degree (29%% of those in firms with 10+ employees versus 20% for those in firms with 1- 9 employees).

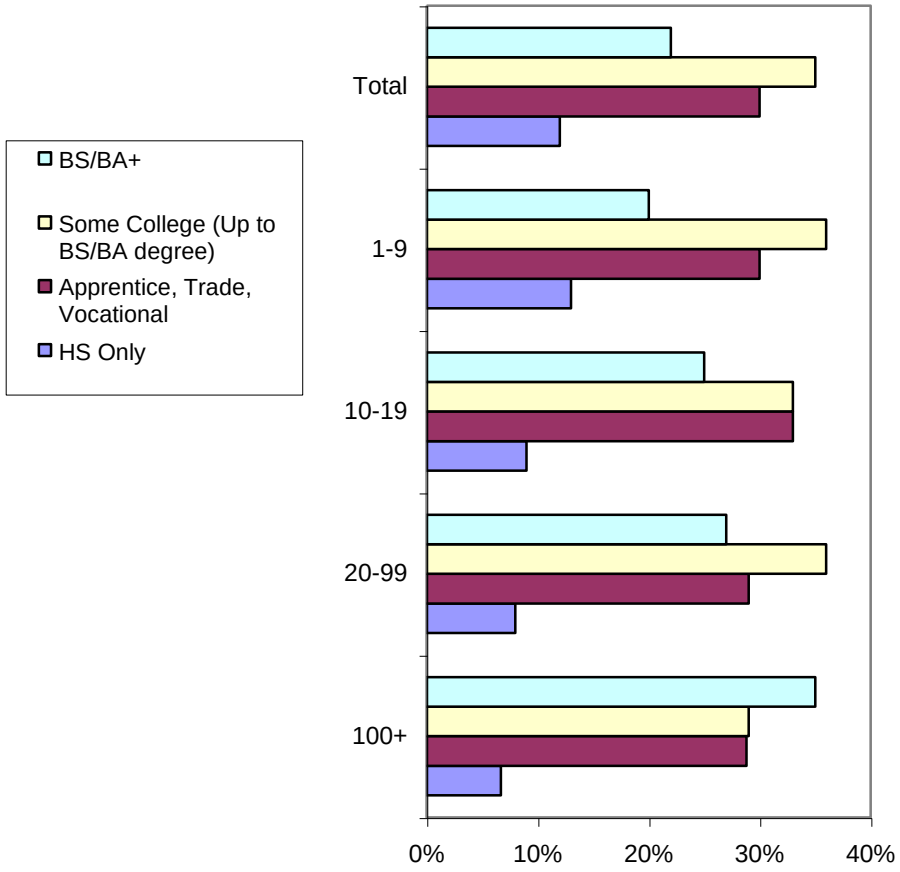
In contrast to findings from 2016, in the 2018 Profile Study, there is no longer a difference between those in smaller firms and larger firms on their likelihood to have only Apprenticeship, Trade or Vocational School training. It is now 30% for those in firms with 1-9 employees and for those in firms with 10+ employees.

- 2016 Profile results are not shown.

Respondent Education
Among Total Sample
2018 Profile Study



Respondent Education by Number of Employees
2018 Profile Study



Level of Responsibility

77% of the sample is composed of company owners and top management, 10% say that they are Master Electricians or the Equivalent Title, 5% say that they are project managers, 3% are field managers and 5% say that they have another title.

- These percentages are generally in line with those from 2016.

- As was the case in 2016, in 2018, those in the West are more likely to describe their responsibility as Owner/Top Management (82%) compared with the total sample (77%). In contrast, those in the West are less likely to describe their responsibility level as Master Electrician or Equivalent (5% vs. 10% for the total sample). Those in the Northeast are more likely to describe themselves as Master Electrician or Equivalent (13% compared with 10% for the total sample).

Gender

97% of the electrical contractors who participated in this survey are male; 3% are female, unchanged from 2016. However, as this question was only asked in one version of the survey, there are too few respondents to further divide for subgroup analysis.

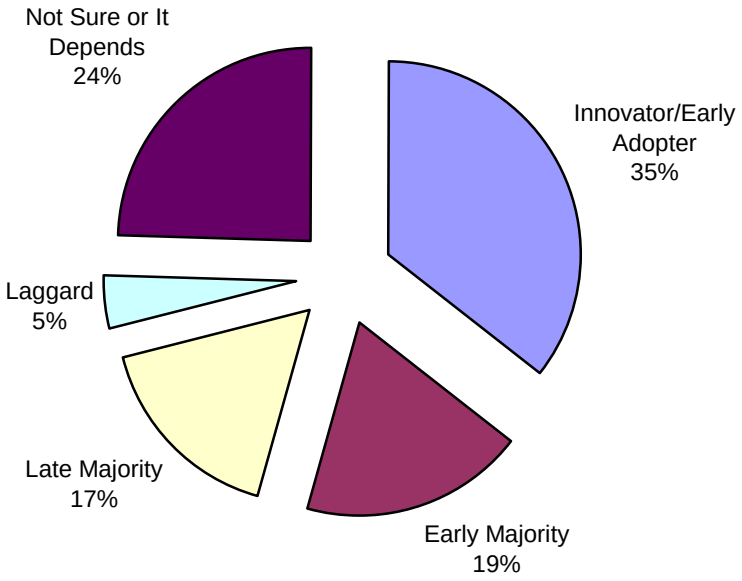
Technology Adoption

The online sample was asked to place themselves on the following scale of technology adoption: Innovator, Early Adopter, Early Majority, Late Majority, Laggard and Not Sure/It Depends. Note that the terms were not defined and were therefore subject to interpretation.

As shown below, about one-half (54%) place themselves on the early end of the scale (Innovator/Early Adopter or Early Majority). A little over 1 in 5 place themselves on the later end of the scale (22% -- either Late Majority or Laggard) and one quarter (24% say that they are Not Sure or that It Depends).

While fully 27% of those aged 65+ place themselves as Innovators/Early Adopters, they are nevertheless significantly lower on this measure compared with those who are aged 35-54 or 55-64. In each of those groups 37% - 38% describe themselves Innovators or Early Adopters.

Technology Adoption
Online Sample Only N = 865



Leisure Activities

Those in the online sample were asked what they do in their leisure time.

- As shown below, electrical contractors are involved in a great many leisure activities, the most notable being home improvement! Overall, however, electrical contractors participate in travel as well as sports, cultural events and various visual arts and crafts. Interestingly, fewer than 10% cite social media (only 13% even among electrical contractors aged 35-54).

	Total	Age 35-54	Age 55-64	Age 65+
	(865)	(262)	(343)	(235)
	%	%	%	%
Home Improvement	48			
Travel	38	*34*		
Fishing/Hunting	36	**41**		*25*
Exercising (Fitness)	26	**34**	*21*	
Camping	23	**33**	*20*	*16*
Golf	23			
Woodworking	22			
Boating/Sailing	19			
Spectator Sports	18			
Music/Theater	17			
Classic/Antique Cars	17			
Cooking/Wine	16	**22**		*13*
Motorcycling	14			
Auto racing	12			
Social Media	8	**13**	*6*	*6*
Crafts	7			
Playing Sports	7	**12**		*3*
Visual Art/Photography	6			
Playing Video Games	6	**11**	*3*	*1*
Fantasy Sports	5	**8**		*3*
All Other Mentions	14			
Mentioned only 1	17			
Mentioned 2 – 3	28			**33**
Mentioned 4+	51	**56**		*44*
None of the Above	4			

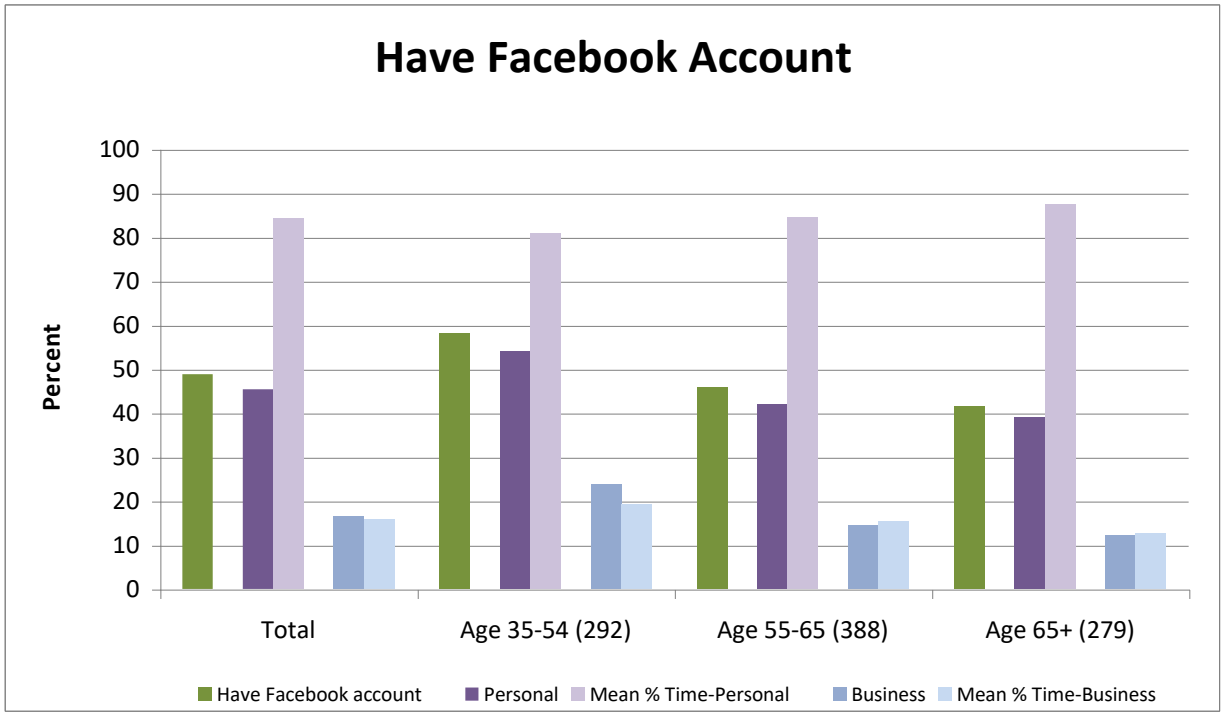
Bold percentages are significantly higher than *italicized* percentages
Blank cells are not statistically different from the total sample

Use of Facebook

Almost 1,000 electrical contractors who participated in the Profile Study were asked about their interactions, if any, with Facebook. Note that almost all of these were part of the online sample, which presumably would be more tech-savvy and tech-friendly. Here's what we found:

- Only about one-half had any type of Facebook account; higher among those aged 35-54 (58%).

- Across the total sample with a Facebook account, an average of about 80% or more of the time that they spend on Facebook is for personal or recreational use and 20% or less is for business use.



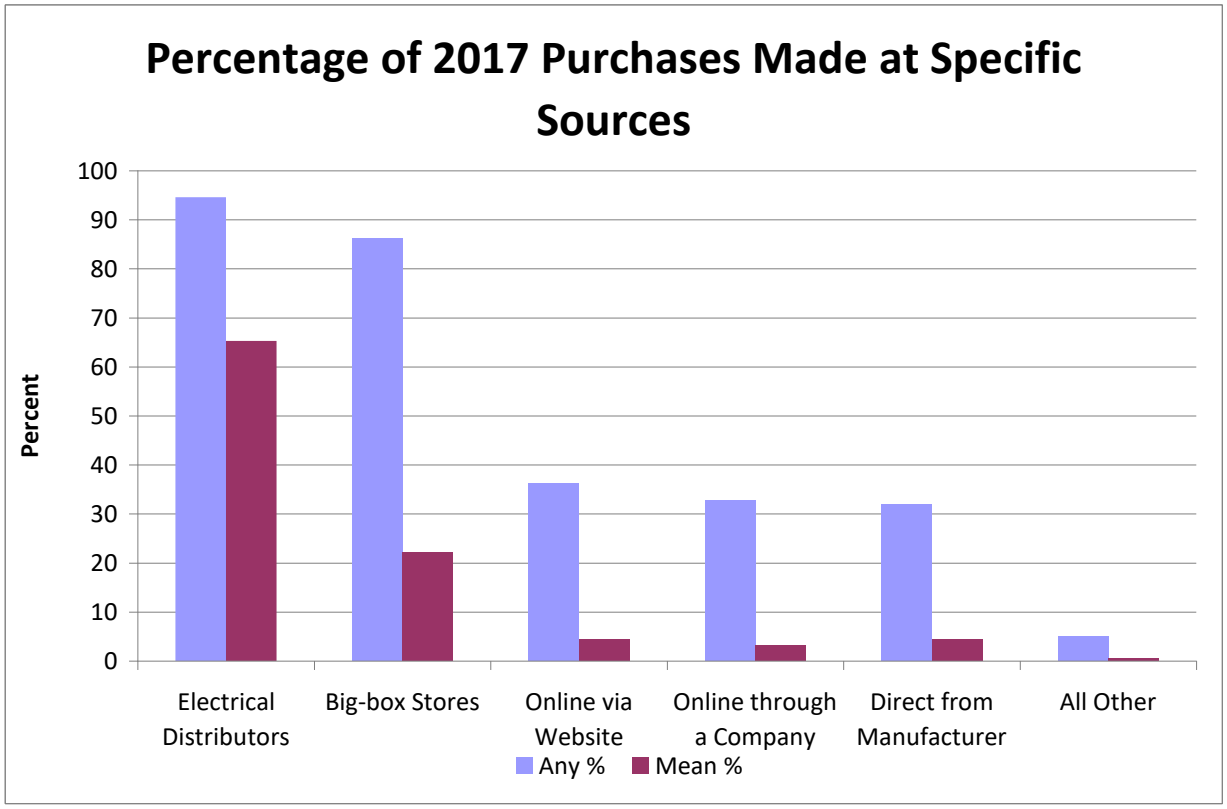
- When asked about the effect, if any, of seeing advertising in Facebook for electrical products or services, more than one-half (55%) said that the ads had no effect; an additional quarter (23%) said that they didn't see the advertising. Only about 10% said that the advertising made them more likely to make a category purchase.

Effect of Facebook Advertising on Likelihood to Purchase Electrical Products or Services				
	Total	Age 35-54	Age 55-65	Age 65+
Have a Facebook Account (Online and V4)	(485)	(168)	(181)	(117)
	%	%	%	%
More likely to Purchase	11	13	8	12
No Effect	55	59	52	49
Less Likely to Purchase	6	6	6	6
Don't See Ads	23	16	26	30
Don't Know/Refused	5	6	8	4

Where Purchases are Made

As we learned from recent Subscriber Panel Studies, about 60% of electrical contractor purchases are made at Electrical Distributors and about 20% at Big-Box stores.

This question was first asked in the 2018 Profile Study and therefore cannot be trended.



▲*"WHAT" TYPES OF WORK DO CONTRACTORS PERFORM?*

Types of Work Performed in Previous Year

Electrical contractors were shown a list of up to 42 different project types and were asked to indicate which they had performed in the previous year. Starting in 2014, the project types were asked separately for Residential and CII construction.

- Two new project types were included for the first time in the 2018 Profile Study. They are: Any Other Lighting Not Included (as part of the other six lighting project types) and Any Electrical Maintenance/Service/Repair

- Because of these additions and the fact that we grouped some of the project types within different categories, the results by *category* are *generally* not trended.

Overview of CII and/or Residential Work Performed (Combined Basis)

When asked about the types of work performed in the previous year (regardless of whether Residential or CII), almost all firms worked on Traditional Power and Lighting (93%). Note that there is a great deal of overlap across this category: 91% worked on Lighting[1]; 86% work on Traditional Power[2]

- About 7 in 10 worked on various aspects of a new category called "Other" (which includes Pre-Assembly/Prefabrication of Electrical Components, HVAC Mechanical, Water Utilities or Waste Water Treatment Plants and/or Any Electrical Maintenance/Service/Repair (70%)

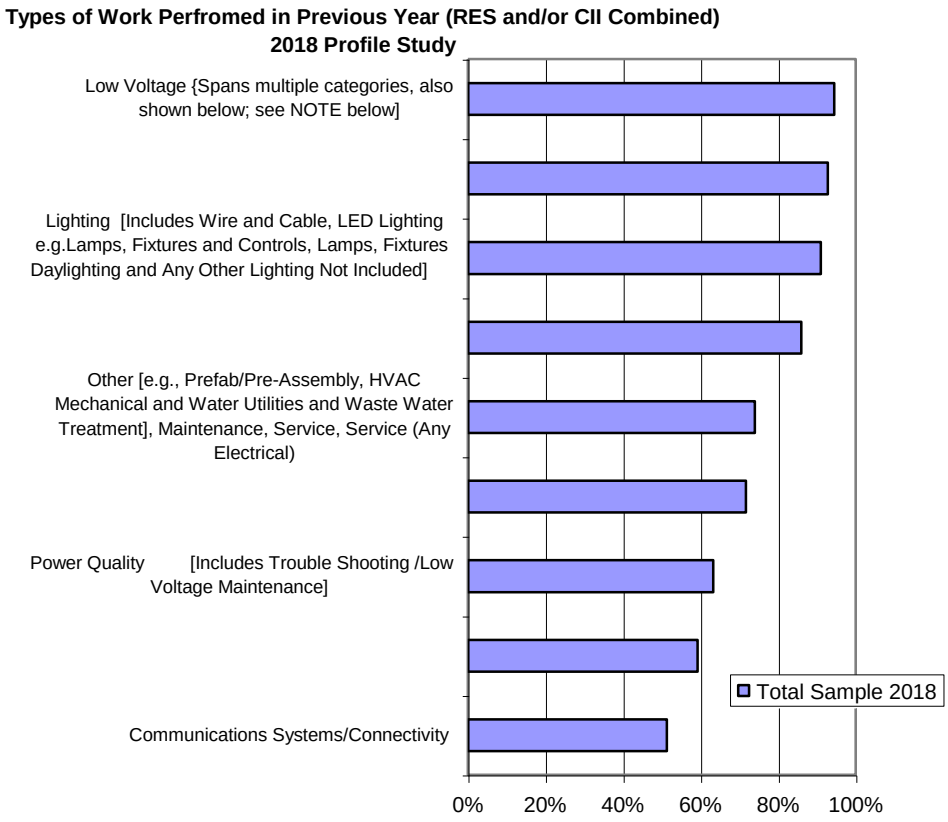
- 72% work on some aspect or aspects of Automations/Controls: 51% worked on CII Automation/Controls*, 46% worked on Residential Automation Controls*

- About 6 in 10 worked on Power Quality (63%) and/or on Sustainability (59%)

- 51% worked Communications Systems/Connectivity

*CII and Residential Automation/Controls are shown separately on the tables starting on page 30.

[1,3] This is the first time that Lighting has been reported separately from Power. In the 2016 Profile Study and earlier, the two groups were reported as Traditional Power and Lighting



NOTE: LOW VOLTAGE (NET) - IN THIS TABLE - INCLUDES: NETWORKING, FIBER OPTICS, STRUCTURED WIRING/CABLING, DATA CENTERS, TROUBLE SHOOTING/MAINTENANCE OF LOW VOLTAGE SYSTEMS, LED LIGHTING, LIGHTING CONTROLS, HOME AUTOMATION, FIRE/LIFE SAFETY, SECURITY, HOME THEATER/SOUND, AUTOMATED BUILDING SYSTEMS, INDUSTRIAL CONTROLS, SOUND AND VIDEO, PROGRAMMING AND COMMISSIONING, HVAC CONTROLS

The individual project types that make up each category are shown on the next page in total[3] and by whether the work was done in Residential or CII construction.

As noted, two new project types were included for the first time in the 2018 Profile Study. They are: Any Other Lighting Not Included (in the other six lighting project types) and Any Electrical Maintenance/Service/Repair.

Observations:

- As shown on the next page, higher percentages of electrical contractors perform many types of work in CII rather than in Residential construction. For example, as shown on the next page, 32% of electrical contractors said that they worked on Structured Wiring/Cabling in CII compared with 24% who did this kind of work in Residential construction.
    - The main exceptions are various types of Sustainability projects: Solar/Photovoltaic, Cogeneration, Geothermal, Energy Storage, Wind Generation, Smart Grid, Microgrids, Fuel Cells; various types of Traditional Power and Lighting projects: Power, Wire and Cable, LED Lighting, Lighting Fixtures and HVAC Mechanical work. In all of these cases, there is great similarity between the percentages performing these types of work in Residential or CII.

Note that there is repeated evidence throughout this report that electrical contractors are continuing to work in somewhat non-traditional areas. For example, 40% worked on either HVAC Controls and/or HVAC Mechanical; 16% work on ***both*** HVAC Controls **and** HVAC Mechanical [not shown]. 13% worked on Water Utilities/Waste Water Treatment Plant projects in the previous year.

95% performed Low Voltage work[4], mentioned here because it is <u>not</u> traditional power (although it often ties into it!).

Above Table is Table 39. Pg. 190 (Net), Table 37, Pg. 158 (CII), Table 35, Pg. 131 (Res)

[3] Without regard to whether the work was done in Residential or CII construction

[4] NOTE: LOW VOLTAGE (NET) - IN THIS TABLE - INCLUDES: NETWORKING, FIBER OPTICS, STRUCTURED WIRING/CABLING, DATA CENTERS, TROUBLE SHOOTING/MAINTENANCE OF LOW VOLTAGE SYSTEMS, LED LIGHTING, LIGHTING CONTROLS, HOME AUTOMATION, FIRE/LIFE SAFETY, SECURITY, HOME THEATER/ SOUND, AUTOMATED BUILDING SYSTEMS, INDUSTRIAL CONTROLS, SOUND AND VIDEO, PROGRAMMING AND COMMISSIONING, HVAC CONTROLS

Types of Work Performed by Company in 2017 TRENDED
Among Those That Work in Residential and /or CII Construction

(Base Answering: 1597)			
COMMUNICATIONS SYSTEMS/CONNECTIVITY	Any **51**	Res **28**	C/I/I **38**
Structured Wiring/ Cabling/Connectivity fn	44	24	<32
Networking (VOIP/ Wireless/Broadband, etc.)	24	10	<20
Data Centers	20	5	<18
Fiber Optics (Communications and Security)	17	4	<15
SUSTAINABILITY	Any **59**	Res **35**	C/I/I **<41**
Energy Efficiency Projects/ Upgrades (non-LEED)	37	17	<29
Electric Vehicle Charging Equipment fn	23	15>	11
LEED Projects	20	7	<16
Solar/Photovoltaics	16	9	<11
Energy Audits (including Thermal Imaging)	12	2	<11
Smart or Net Metering	10	4	<8
Cogeneration	7	3	<5
Energy Storage	6	3	4
Geothermal	5	3	2
Wind Generation	4	2	3
Smart Grid Technology	3	1	2
Microgrids	2	1	2
Fuel Cells	2	0.5	2
POWER QUALITY	**Any 63**	**Res 37**	**C/I/I <46**
Backup Power/UPS	47	22	<33
Trouble Shooting/Maintenance of Low Voltage Systems	40-	23	<30
TVSS/Lightning Surge Suppression	33	15	<25
Energy Management/Power Quality	20	5	<17

(Base Answering: 1597)			
TRADITIONAL POWER/LIGHTING	Any **93**	Res **70**	C/I/I **71**
Lighting	91	67	68
LED Lighting (Including Lamps, Fixtures and Controls)	87	62	63
Lighting Fixtures	84	60	61
Ballasts or LED Drivers	75	46	<57
Lamps	70	47	<52
Lighting Controls	69	43	<48
Daylighting/Shading Systems	22	8	<18
[NEW] Any Other Lighting Not Included Above	22	11	<17
Power	86	64	62
Power	80	58	57
Wire and Cable	80-	59	58
AUTOMATION/CONTROL SYSTEMS	**Any 72**	**Res 46**	**CII <51**
Fire/Life Safety (including Alarms/Detectors)	47	28	<32
HVAC Controls	34-	20	<25
Security: CCTV/ Access/Motion, etc	34	18	<25
Industrial Controls (including PLCS and VFDS and Switchgear)fn	31	N/A	31
Home Automation/ Smart Home/Connectivity	21	21	N/A
Home Theater/Sound or VDV	16	16	N/A
Building Automation Systems/Facilities Connectivity fn	18	N/A	18
Sound and Video or VDV	15	N/A	15
Programming and Commissioning	15	4	<14
OTHER	**Any 74**	**Res 51**	**C/I/I <59**
[NEW] (Any Electrical) Maintenance/Service/Repair	70	49	<55
HVAC (Mechanical)	22	13	<15
Pre-Assembly/Pre-Fabrication of Electrical Components	18	6	<16
Water Utilities or Waste Water Treatment Plants	13	N/A	13

fn signifies a slightly different wording in the 2016 Profile Study
> or < indicates that the percentage is higher or lower at the 90% level of confidence

TRENDED RESULTS

In the case of Residential and CII projects on a *combined* basis, 14 of the 42 work types showed significant changes compared with two years earlier:

In almost all of the categories where there were significant differences from two years earlier, the changes were a combination of gains and losses:

- In the case of Traditional Power and Lighting:
    - Power and/or Wire and Cable declined. As will be shown in a later section of this report, it may be that electrical contractors have substituted more technical and value added work in its stead.
    - LED Lighting and Ballasts/LED Drivers posted significant increases while Lamps and/or Lighting Controls declined. However, these latter types of work may have been reported as part of the relatively new category of LED Lighting (including Lamps, Fixtures and Controls).
- In the case of Automation/Control Systems HVAC Controls declined.
- In Sustainability, Electric Vehicle Charging Equipment posted an increase while Cogeneration and Geothermal posted small, but significant declines.
- In Power Quality, Trouble Shooting/Maintenance of Low Voltage Systems declined. There were no other changes in this category.
- In Communications Systems/Connectivity, Data Centers increased while fewer electrical contractors reported working on Fiber Optics and/or Networking VOIP/Wireless or Broadband. Of all of the project types included in this study, Networking experienced the steepest decline: from 35% in 2016 to 24% in 2018.

TRENDED RESULTS, continued

There were changes in 9 of the 42 work types when the results are limited to Residential construction:

- Data Centers, Electric Vehicle Charging Equipment and LED Lighting all increased.
- Networking VOIP, Geothermal, and two types of Power Quality – Backup Power/UPS and Trouble Shooting of Low Voltage Systems -- declined along with HVAC Mechanical.
- Power, Daylighting/Shading Systems and Lighting Controls posted declines. However, the work in Lighting Controls may now be reported as part of the new category of LED Lighting.

- There were changes in 10 of the 42 project types when the results are limited to CII construction: Data Centers, Electric Vehicle Charging Equipment and Ballasts or LED Drivers all increased.
- Networking VOIP and Fiber Optics posted declines as did Cogeneration and Troubleshooting/Maintenance of Low Voltage Systems. Power, Wire and Cable and Lighting Controls declined.
- As noted in the two sections above, the declines in Lighting Controls may be that this type of work is now reported as part of LED Lighting. The decline in Power and Wire and Cable may be that electrical contractors are working in more value added areas instead.

+ and – on the next tables indicate significant changes at the 90% level of confidence vs. the 2016 Profile Study (each reporting on the previous year)

Types of Work Performed by Company in 2017 TRENDED
Among Those That Work in Residential and /or CII Construction

(Base Answering: 1597)			
COMMUNICATIONS SYSTEMS/CONNECTIVITY	Any **51-**	Res **28-**	C/I/I **38-**
Structured Wiring/ Cabling/Connectivity fn	44	24	32
Networking (VOIP/ Wireless/Broadband, etc.)	24-	10-	20-
Data Centers	20+	5+	18+
Fiber Optics (Communications and Security)	17-	4	15-
SUSTAINABILITY	Any **59**	Res **35**	C/I/I **41**
Energy Efficiency Projects/ Upgrades (non-LEED)	37	17	29
Electric Vehicle Charging Equipment fn	23+	15+	11+
LEED Projects	20	7	16
Solar/Photovoltaics	16	9	11
Energy Audits (including Thermal Imaging)	12	2	11
Smart or Net Metering	10	4	8
Cogeneration	7-	3	5-
Energy Storage	6	3	4
Geothermal	5-	3-	2
Wind Generation	4	2	3
Smart Grid Technology	3	1	2
Microgrids	2	1	2
Fuel Cells	2	0.5	2
POWER QUALITY	**Any 63-**	**Res 37-**	**C/I/I 46-**
Backup Power/UPS	47	22-	33
Trouble Shooting/Maintenance of Low Voltage Systems	40-	23-	30-
TVSS/Lightning Surge Suppression	33	15	25
Energy Management/Power Quality	20	5	17

(Base Answering: 1597)			
TRADITIONAL POWER/LIGHTING	Any **93**	Res **70**	C/I/I **71**
Lighting	91	67	68
LED Lighting (Including Lamps, Fixtures and Controls)	87+	62+	63
Lighting Fixtures	84	60	61
Ballasts or LED Drivers	75+	46	57+
Lamps	70-	47	52
Lighting Controls	69-	43-	48-
Daylighting/Shading Systems	22	8-	18
[NEW] Any Other Lighting Not Included Above	22	11	17
Power	86Δ	64Δ	62Δ
Power	80-	58-	57-
Wire and Cable	80-	59	58-
AUTOMATION/CONTROL SYSTEMS	**Any 72**	**Res 46**	**CII 51**
Fire/Life Safety (including Alarms/Detectors)	47	28	32
HVAC Controls	34-	20	25
Security: CCTV/ Access/Motion, etc	34	18	25
Industrial Controls (including PLCS and VFDS and Switchgear)fn	31	N/A	31
Home Automation/ Smart Home/Connectivity	21	21	N/A
Home Theater/Sound or VDV	16	16	N/A
Building Automation Systems/Facilities Connectivity fn	18	N/A	18
Sound and Video or VDV	15	N/A	15
Programming and Commissioning	15	4	14
OTHER	**Any 74**	**Res 51**	**C/I/I 59**
[NEW] (Any Electrical) Maintenance/Service/Repair	70	49	55
HVAC (Mechanical)	22	13-	15
Pre-Assembly/Prefabrication of Electrical Components	18	6	16
Water Utilities or Waste Water Treatment Plants	13	N/A	13

fn signifies a slightly different wording in the 2018 Profile Study compared with the 2016 Profile Study

+ and - indicate significant changes at the 90% level of confidence vs. the 2016 Profile Study (each reporting on the previous year)

Δ Power was not reported as a separate net in 2016

Types of Work Performed by Company in 2017 vs. 2015
Residential and/or CII Construction on a Combined Basis

(Base Answering	(1597)		(2419)
COMMUNICATIONS SYSTEMS/CONNECTIVITY	2017 **51**	<	2015 **57**
Structured Wiring/Cabling	44		45
Networking VOIP/ Wireless/Broadband, etc.)	24	<	**35**
Data Centers	**20**	>	17
Fiber Optics: (Communications and Security)	17	<	**20**

SUSTAINABILITY	2017 59		2015 57
Energy Efficiency Projects/ Upgrades (non-LEED)	37		37
Electric Vehicle Charging Equipment fn	**23**	>	17
LEED Projects	20		19
Solar/Photovoltaics	16		16
Energy Audits (including Thermal Imaging)	12		11
Smart or Net Metering	10		10
Cogeneration	7	<	**10**
Energy Storage	6		5
Geothermal	5	<	**7**
Wind Generation	4		4
Smart Grid Technology	3		2
Fuel Cells	2		2
Microgrids	2		2

POWER QUALITY	2017 63	<	2015 **68**
Backup Power/UPS	47		49
Trouble Shooting/ Maintenance of Low Voltage Systems	40	<	**45**
TVSS/Lightning Surge Suppression	33		34
Energy Management/Power Quality	20		20

> and < indicate significant changes at the 90% level of confidence vs. the 2016 Profile Study (each reporting on the previous year)

fn signifies a slightly different wording in the 2018 Profile Study

Base Answering	(1597)		(2419)
TRADITIONAL POWER/LIGHTING	2017 93		2015 94
Lighting	91		**91**
LED Lighting (Including Lamps, Fixtures and Controls)	**87**	>	84
Lighting Fixtures	84		84
Ballasts or LED Drivers	**75**	>	69
Lamps	70	<	**73**
Lighting Controls	69	<	**72**
Daylighting/Shading Systems	22		23
[NEW] Any Other Lighting Not Included Above	22		N/A
Power	86		**N/A**
Power	80	<	**84**
Wire and Cable	80	<	**84**

AUTOMATION/CONTROL SYSTEMS	2017 72		2015 73
Fire/Life Safety (including Alarms/Detectors)	47		48
HVAC Controls	34	<	**38**
Security: CCTV/Access/Motion, etc.	34		33
Industrial Controls (including PLCS and VFDS and Switchgear)fn	31		29
Home Automation/Smart Home/Connectivity	21		21
Home Theater/Sound or VDV	16		18
Building Automation Systems/Facilities Connectivity fn	**18**		16
Sound and Video or VDV	15		16
Programming and Commissioning	15		15

OTHER	2017 **74**	>	2015 40
MSR (Any Electrical)	70		N/A
HVAC (Mechanical)	22		23
Pre-Assembly/Prefabrication of Electrical Components	18		19
Water Utilities or Waste Water Treatment Plants	13		14

Types of Residential Work Performed by Company in 2017 vs. 2015 (Residential)

Base Answering	(1597)		(2419)
COMMUNICATIONS SYSTEMS/CONNECTIVITY	2017 28	<	2015 **33**
Structured Wiring/Cabling	24		25
Networking VOIP/ Wire-less/Broadband, etc.)	10	<	**18**
Data Centers	**5**	>	3
Fiber Optics (Communications and Security)	4		4
SUSTAINABILITY	2017 **35**		2015 **33**
Energy Efficiency Projects/ Upgrades (non-LEED)	17		16
Electric Vehicle Charging Equipment fn	**15**	>	11
Solar/Photovoltaics	9		9
LEED Projects	7		7
Smart or Net Metering	4		5
Geothermal	3	<	**5**
Cogeneration	3		4
Energy Storage	3		2
Wind Generation	2		2
Energy Audits (including Thermal Imaging)	2		3
Smart Grid Technology	1		1
Microgrids	1		0.5
Fuel Cells	0.5		0.5
POWER QUALITY	2017 37	<	2015 **42**
Trouble Shooting/ Maintenance of Low Voltage Systems	23	<	**26**
Backup Power/UPS	22	<	**25**
TVSS/Lightning Surge Suppression	15		**17**
Energy Management/Power Quality	5		5

Base Answering	(1597)		(2419)
TRADITIONAL POWER/LIGHTING	2017 **70**		2015 **70**
Lighting	67		66
LED Lighting (Including Lamps, Fixtures and Controls)	**62**	>	59
Lighting Fixtures	60		60
Lamps	47		49
Ballasts or LED Drivers	46		44
Lighting Controls	43	<	**46**
Daylighting/Shading Systems	8	<	**10**
[NEW] Any Other Lighting Not Included Above	11		N/A
Power	64		N/A
Wire and Cable	59		61
Power	58	<	**61**
AUTOMATION/CONTROL SYSTEMS	2017 46		2015 47
Fire/Life Safety (including Alarms/Detectors)	28		30
Home Automation/Smart Home/Connectivity	21		21
HVAC Controls	20		21
Security: CCTV/Access/Motion, etc.	18	=	16
Home Theater/Sound or VDV	16	=	18
Programming and Commissioning	4		4.6
OTHER	**2017 51**	>	**2015** 19
Maintenance/Service/Repair (Any Electrical) [NEW]	49		N/A
HVAC (Mechanical)	13	<	**15**
Pre-Assembly/Prefabrication of Electrical Components	6		7

> and < indicate significant changes at the 90% level of confidence vs. the 2016 Profile Study (each reporting on the previous year)

fn signifies a slightly different wording in the 2018 Profile Study

Types of CII Work Performed by Company in 2017 vs. 2015 (C/I/I)

Base Answering	(1597)		(2419)
COMMUNICATIONS SYSTEMS/CONNECTIVITY	**2017 38**	<	2015 **43**
Structured Wiring/Cabling fn	32		34
Networking VOIP/ Wireless/Broadband, etc.)	20	<	**27**
Data Centers	**18**	>	16
Fiber Optics Communications and Security)	15	<	**18**

SUSTAINABILITY	2017 41		2015 40
Energy Efficiency Projects/ Upgrades (non-LEED)	29		30
LEED Projects	16		15
Energy Audits (including Thermal Imaging)	11		10
Solar/Photovoltaics	11		10
Electric Vehicle Charging Equip fn	**11**	>	9
Smart or Net Metering	8		7
Cogeneration	5	<	**7**
Energy Storage	4		4
Wind Generation	3		3
Geothermal	2		3
Fuel Cells	2		2
Smart Grid Technology	2		2
Microgrids	2		1

Base Answering	(1597)		(2419)
TRADITIONAL POWER/LIGHTING	2017 71		2015 72
Lighting	**68**		**69**
LED Lighting (Including Lamps, Fixtures and Controls)	63		62
Lighting Fixtures	61		63
Ballasts or LED Drivers	**57**	>	53
Lamps	52		54
Lighting Controls	48	<	**52**
Daylighting/Shading Systems	18		18
[NEW] Any Other Lighting Not Included Above	17		**N/A**
Power	62		**N/A**
Wire and Cable	58	<	**63**
Power	57	<	**62**

AUTOMATION/CONTROL SYSTEMS	2017 51		2015 53
Fire/Life Safety (including Alarms/Detectors)	32		33
Industrial Controls (including PLCS and VFDS, Switchgear) fn	31		29
HVAC Controls	25		27
Security: CCTV/Access/Motion, etc.	25		26
Building Automation Systems/Facilities Connectivity fn	**18**		16
Sound and Video or VDV	15		16
Programming and Commissioning	14		15
Home Automation/Smart Home/Connectivity	**N/A**		
Home Theater/Sound or VDV	**N/A**		

POWER QUALITY	2015 46		2015 48
Backup Power/UPS	33		34
Trouble Shooting/ Maintenance of Low Voltage Systems	30	<	**33**
TVSS/Lightning Surge Suppression	25		24
Energy Management/Power Quality	17		17

OTHER	**2017 59**	>	2015 31
Maintenance/Service/Repair (Any Electrical) [NEW]	55		N/A
Pre-Assembly/Prefabrication of Electrical Components	16		16
HVAC (Mechanical)	15		15
Water Utilities or Waste Water Treatment Plants	13		14

fn signifies a slightly different wording in the 2018 Profile Study

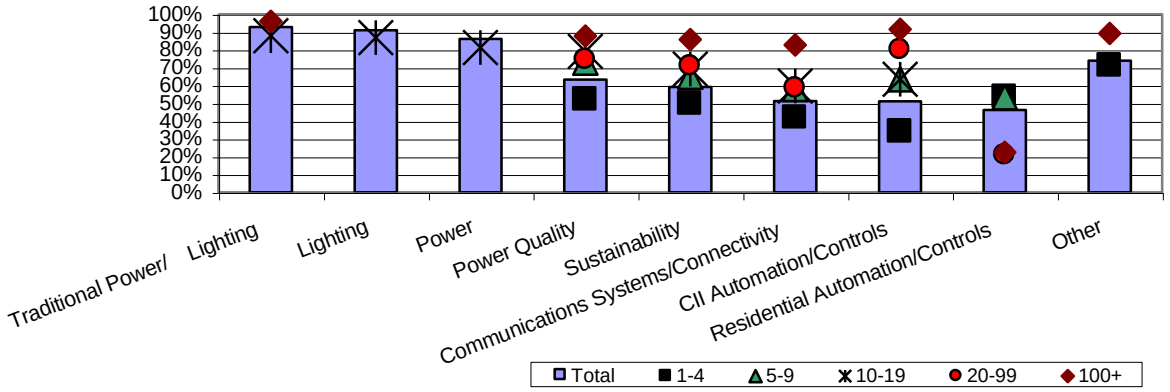
> and < indicate significant changes at the 90% level of confidence in the 2018 Profile Study vs. the 2016 Profile Study (each reporting on the previous year)

The differences by category by company size are shown below:

- In general, larger firms -- particularly those with 100+ but also those with 20-99 employees -- are more likely to perform most of the different types of work shown below.

- In addition, firms with 5+ employees are also more likely than smaller firms to perform work in most aspects of Power Quality, Sustainability, Communications Systems/Connectivity and CII Automation/Controls. On the pages to follow note the extent to which firms with 5-9 employees are more similar to those with 10-19 than to firms with 1-4 employees.

Types of Work Performed in Previous Year by Company Size
CII and Residential on a Combined Basis
(2018 Profile Study Total Sample = 1597)



Subgroups that are shown above the blue bar are significantly larger than average while those within the bar are smaller than average. Subgroups that are average are not shown . The value of the icon is measured at its center.

On the next pages, results by subgroup are compared to the total. Where a subgroup is greater than the total, the percentage is **bolded**; where it is smaller it is in *italic*s. Empty cells indicate that there is no difference between that subgroup and the total.

Among firms working in Residential and/or CII on a Combined Basis:

- Firms with **100+** employees are also more likely than average to perform almost all types of work shown on this page with the exception of LED Lighting and Lighting Fixtures, where there is no company-size skew, and Home Theater, which is more the province of firms with 1-9 (really 1-4) employees.
- Firms with **20-99** employees are more likely than average to perform most, but not all, types of work.

Types of Work Performed in Previous Year By Number of Employees
Total Sample (2018 Profile Study) Residential and/or CII Construction on a Combined Basis

	Total	1-4	5-9	1-9	10-19	20-99	100+
	%	%	%	%	%	%	%
Power	80	*77*		*78*		**85**	**87**
Wire and Cable	80	*78*		*79*			**88**
LED Lighting (Including Lamps, Fixtures, and Controls)	87						
Lighting Fixtures	84						
Lamps	70	*65*	**76**	*68*		**75**	**76**
Lighting Controls	69	*60*	**77**	*64*	**78**	**83**	**84**
Ballasts or LED Drivers	75	*70*	**82**	*73*			**81**
Daylighting/Shading Systems	22	*11*		*13*	**34**	**42**	**60**
[NEW] Any Other Lighting Not Included Above	22	*16*		*17*		**29**	**52**
Structured Wiring/Cabling/Connectivity	44	*36*	**51**	*39*	**51**		**72**
Networking (VOIP/Wireless/Broadband, etc.)	24	*15*		*18*	**31**	**33**	**56**
Fiber Optics (Communications and Security)	17	*7*	*14*	*8*	**26**	**32**	**65**
Data Centers	20	*10*	**25**	*13*	**27**	**29**	**60**
Backup Power/UPS	47	*34*	**53**	*38*	**66**	**64**	**82**
Troubleshooting/Maintenance of Low-Voltage Systems	40	*32*	**47**	*35*			**63**
TVSS/Lightning Surge Suppression	33	*20*		*24*	**47**	**55**	**71**
Energy Management/Power Quality	20	*8*		*11*	**26**	**37**	**61**
Fire/Life Safety (Including Alarms/Detectors)	47	*37*	**57**	*41*		**59**	**77**
HVAC Controls	34	*30*		*31*			**59**
Security: CCTV/Access/Motion, etc.	34	*23*		*26*	**42**	**47**	**70**
Industrial Controls (Including PLCs and VFDs)	31	*17*	**38**	*21*		**53**	**76**
Home Automation/Smart Home/Connectivity	21		**30**	**23**		*13*	*10*
Home Theater/Sound or VDV	16	**17**		**18**		*7*	*7*
Building Automation Systems/Facilities Connectivity	18	*7*		*9*	**29**	**37**	**60**
Sound and Video or VDV	15	*6*		*8*		**27**	**51**
Programming and Commissioning	15	*6*		*8*		**28**	**62**

Table Continues on Next Page **Empty Cells Indicate no difference from Total Sample**

- Firms with 10-19 employees **as well as firms with 5-9** employees are more likely than firms with 1-4 employees to perform many of the types of work included in this study. As has been noted since at least 2014, firms with 5-9 employees behave much more like larger firms (10+ or 20+ employees) than to their smaller counterparts; also note their higher involvement with Geothermal.

- Sustainability projects are really the province of firms with 100+ employees although non-LEED Energy Efficiency Projects and Energy Audits are also more likely to be performed by firms with 10+ employees compared to their smaller counterparts. In aggregate, the greater involvement in most types of work by larger firms is shown in the rows highlighted in yellow.

Types of Work Performed in Previous Year By Number of Employees,
Total Sample (2018 Profile Study) Residential and /or CII Construction Combined

	%	%	%	%	%	%	%
	Total	**1-4**	**5-9**	**1-9**	**10-19**	**20-99**	**100+**
Energy Efficiency Projects/Upgrades (Non-LEED)	37	*29*		*31*	**46**	**52**	**61**
LEED Projects	20	*10*		*12*		**37**	**56**
Electric Vehicle Charging Equipment	23	*20*		*21*	**32**		**39**
Solar/Photovoltaics	16	*11*		*12*			**43**
Energy Audits (Including Thermal Imaging)	12	*4*		*5*	**19**	**22**	**44**
Co-Generation	7	*4*		*5*			**29**
Smart or Net Metering	10	*5*		*6*		**16**	**37**
Geothermal	5	*3*	**9**				**11**
Energy Storage	6	*3*		*4*			**22**
Wind Generation	4	*2*		*3*			**14**
Fuel Cells	2	*0.5*		*0.9*			**10**
Microgrids	2	*0.8*		*1*		*0.5*	**9**
Smart Grid Technology	3	*0.8*		*1*			**11**
HVAC (Mechanical)	22				*16*		**34**
Pre-Assembly/Prefabrication of Elec Components	18	*10*		*12*		**32**	**60**
Water Utilities or Waste Water Treatment Plants	13	*6*		*8*		**21**	**40**
[NEW] Maintenance/Service/Repair (Any Electrical)	70						**80**
Any HVAC (Controls ***or*** Mechanical)	40	*36*		*37*			**64**
HVAC Controls *and* Mechanical	16	*14*					**29**
Any Low Voltage	95						**98**
Number of Categories Worked In (of 6)							
Only 1	6	**9>**	*3*	**8>**	*0*	*<2*	*2*
2	11	**15>**	*8*	**13>**	*6*	*6>*	*0.6*
3	16	**19>**	*13*	18	**19**	**13>**	7
4	16	18	19	18	14	***12>***	*4*
5	21	*19*	**<26**	20	25	**27>**	*16*
All 6	28	*18*	**<30**	*21*	33	37	**<69**
Number of Project Types (ANY)	**98**	**98**	**98**	98	**98**	**97**	**99**
Mentioned 1-9 Types	32	**44>**	20	**39>**	21	17	11
Mentioned 10-11 Types	14	16	14	**16>**	12	**11>**	3
Mentioned 12+ Project Types	52	38	**<64**	*44*	65	69	**<85**
Mentioned 12-19	32	30	**<42**	33	**37**	**35>**	16
Mentioned 20 + (out of 43) Project Types	20	8	**<22**	*11*	28	**34**	**<69**

Among firms working in CII:

- As has been noted in earlier Profile Study reports, CII work is really the province of firms with 10+ employees. However, firms with 5-9 employees do play a role. As shown below, they are more likely than firms with 1-4 employees to perform projects in the areas of CII Power, many aspects of Lighting, HVAC Controls and Structured Wiring as well as several types of Power Quality and Automation projects.

Types of Work Performed in Previous Year By Number of Employees, CII (2018 Profile Study)

	Total	1-4	5-9	1-9	10-19	20-99	100+
	%	%	%	%	%	%	%
Wire and Cable	58	*45*	**70**	*50*	**65**	**80**	**84**
Lighting Fixtures	61	*51*	**74**	*56*	**68**	**82**	**76**
Power	57	*43*	**69**	*49*	**67**	**81**	**84**
LED Lighting (Including Lamps, Fixtures, and Controls)	63	*50*	**74**	*55*	**69**	**86**	**87**
Lamps	52	*40*	**65**	*46*	**61**	**71**	**73**
Ballasts or LED Drivers	57	*45*	**72**	*50*	**65**	**76**	**78**
Lighting Controls	48	*32*	**62**	*38*	**62**	**80**	**81**
Daylighting/Shading Systems	18	*6*		*8*	**28**	**41**	**56**
[NEW] Any Other Lighting Not Included Above	17	*8*		*11*	**24**	**27**	**50**
Structured Wiring/Cabling/Connectivity	32	*19*	**40**	*24*	**43**	**46**	**70**
Networking (VOIP/Wireless/Broadband, etc.)	20	*11*		*13*	**26**	**32**	**56**
Fiber Optics (Communications and Security)	15	*5*		*6*	**23**	**31**	**63**
Data Centers	18	*8*		*10*	**24**	**28**	**60**
Backup Power/UPS	33	*16*	**41**	*21*	**55**	**60**	**79**
Troubleshooting/Maintenance of Low-Voltage Systems	30	*18*	**39**	*23*	**38**	**43**	**62**
TVSS/Lightning Surge Suppression	25	*8*	**30**	*13*	**39**	**53**	**69**
Energy Management/Power Quality	17	*6*		*9*	**24**	**36**	**58**
Fire/Life Safety (Including Alarms/Detectors)	32	*15*	**43**	*21*	**44**	**58**	**75**
Industrial Controls (Including PLCs and VFDs and Switchgear)	31	*17*	**38**	*21*		**53**	**76**
HVAC Controls	25	*16*		*19*		**34**	**57**
Security: CCTV/Access/Motion, etc.	25	*11*	**31**	*15*	**38**	**44**	**69**
Building Automation Systems/Facilities Connectivity	18	*7*		*9*	**29**	**37**	**60**
Sound and Video or VDV	15	*6*		*8*		**27**	**51**
Programming and Commissioning	14	*4*	*10*	*6*		**28**	**61**
Home Automation/Smart Home/Connectivity	**N/A**						
Home Theater/Sound or VDV	**N/A**						

Table Continues on Next Page Empty Cells Indicate no difference from Total Sample

Among firms working in CII, continued: As has been the case in the recent past, the largest firms (100+ employees) are also the most likely to perform most types of Sustainability projects in CII construction. Sustainability project involvement increases along with firm size.

Note that the largest firms (20+ employees) and firms with 5-9 employees are also more likely to perform Electrical M/S/R in a CII setting. In addition, firms with 5-9 employees are also more likely than smaller firms to perform non-LEED Efficiency projects, Low Voltage and HVAC work.

The differences by company size in aggregate are shown in the rows highlighted in yellow.

Types of Work Performed in Previous Year By Number of Employees, CII (2018 Profile Study)							
	Total	1-4	5-9	1-9	10-19	20-99	100+
	%	%	%	%	%	%	%
Energy Efficiency Projects/Upgrades (Non-LEED)	29	16	37	21	38	48	60
LEED Projects	16	6		8		34	54
Solar/Photovoltaics	11	4		6		18	43
Energy Audits (Including Thermal Imaging)	11	3		4	16	22	44
Electric Vehicle Charging Equipment	11	5		7		18	38
Co-Generation	5	1		2		10	29
Smart or Net Metering	8	3		3		14	37
Energy Storage	4	1		2		8	22
Wind Generation	3	0.6		1			13
Geothermal	2	0.5		1			11
Fuel Cells	2	0.1		0.6			9
Smart Grid Technology	2	0.5		0.8			11
Microgrids	2	0.3		0.8		0.5	9
Pre-Assembly/Prefabrication of Electrical Comp'nts	16	7		9		32	59
HVAC (Mechanical)	15	11	21	13			33
Water Utilities or Waste Water Treatment Plants	13	6		8		21	40
[NEW] Maintenance/Service/Repair (Any Electrical)	55	47	64	50		65	79
Any HVAC (HVAC ***or*** Mechanical)	28	20	34	23		38	62
HVAC Controls ***and*** Mechanical	11	7	15	9			28
Any Low Voltage	72	61	83	66	81	92	94
Number of Categories Worked In (of 6)							
1	8	11>	5	10	4	2	2
2	12	15>	10	14	9	7>	1
3	14	14	15	14	17	14>	4
4	12	12	15	13	10	11>	4
5	13	8	<19	10	20	23>	14
All 6	20	8	<24	11	27	<36	<69
Number of Project Types (ANY)	85	69	87	72	87	93	95
Mentioned 1-9 Types	34	43>	29	40>	30>	19>	11
Mentioned 10-11 Types	8	8	<12	8	5	9>	3
Mentioned 12+ Project Types	43	18	<46	24<	52	<65	<81
Mentioned 12-19	22	15	<29	18<	32	32>	16
Mentioned 20 + (out of 43) Project Types	21	3	<17	6<	20	<33	<65

Among Firms Working in Residential construction: What is interesting here is that the very smallest firms perform so many aspects of Traditional Power/Lighting, Power Quality, Communications/ Connectivity, Automation/Controls Systems, as well as HVAC Mechanical work. In contrast to two years ago, the smallest electrical contractors are now even doing some Sustainability work, specifically non-LEED Energy Upgrades and Electric Vehicle Charging Equipment.

Note that their widespread involvement in so many categories only becomes evident when CII work (which tends to overshadow residential work) is excluded. As shown on the next page, more than two-thirds perform *Residential* Low Voltage work.

- Firms with 5-9 employees are also above average in their work in Residential construction.

Types of Work Performed in Previous Year By Number of Employees, Residential (2018 Profile Study)

	Total	1-4	5-9	1-9	10-19	20-99	100+
	%	%	%	%	%	%	%
Power	58	**69**	**64**	**68**	*48*	*31*	*21*
Wire and Cable	59	**70**	**64**	**69**	*50*	*29*	*22*
Lighting Fixtures	60	**73**		**71**	*50*	*28*	*21*
LED Lighting (Including Lamps, Fixtures, and Controls)	62	**75**	**68**	**73**	*51*	*28*	*21*
Lamps	47	**56**	**53**	**55**		*23*	*19*
Lighting Controls	43	**49**	**53**	**50**		*21*	*16*
Ballasts or LED Drivers	46	**55**	**53**	**55**	*39*	*21*	*18*
Daylighting/Shading Systems	8		**13**			*4*	
[NEW] Any Other Lighting Not Included Above	11	**13**		**13**		*5*	*6*
Structured Wiring/Cabling/Connectivity	24	**28**		**28**		*11*	*11*
Networking (VOIP/Wireless/Broadband, etc.)	10		**13**	**10**		*6*	
Fiber Optics (Communications and Security)	4						
Data Centers	5		**11**	**6**		*1*	*2*
Troubleshooting/Maintenance of Low-Voltage Systems	23	**27**	**30**	**27**		*11*	*7*
Backup Power/UPS	22	**26**	**27**	**26**		*8*	*9*
TVSS/Lightning Surge Suppression	15			**17**		*10*	*5*
Energy Management/Power Quality	5						
Fire/Life Safety (Including Alarms/Detectors)	28	**32**		**32**		*13*	*16*
HVAC Controls	20	**25**		**24**		*5*	*6*
Home Automation/Smart Home/Connectivity	21		**30**	**23**		*13*	*10*
Home Theater/Sound or VDV	16	**17**		**18**		*7*	*7*
Security: CCTV/Access/Motion, etc.	18		**24**	**20**		*10*	
Programming and Commissioning	4					*2*	
Building Automation Systems/Facilities Connectivity	**N/A**						
Industrial Controls (Including PLCs and VFDs and Switchgear)	**N/A**						
Sound and Video or VDV	**N/A**						

Table Continues on Next Page Empty Cells Indicate no difference from Total Sample

Among Firms Working in Residential, continued:

- Firms with 5-9 employees are more likely than firms with 1-4 employees to work in two Sustainability project types: Geothermal and Cogeneration. Firms with 1-4 employees are more likely to work on HVAC Mechanical and, as might be expected, on Electrical Maintenance, Service and Repairs.

- Note that firms that do residential work tend **not** to work on all of the project types or categories. In contrast, larger firms working in CII tend to work on many more project types.

Types of Work Performed in Previous Year By Number of Employees, Residential (2018 Profile Study)							
	Total	**1-4**	**5-9**	**1-9**	**10-19**	**20-99**	**100+**
	%	%	%	%	%	%	%
Energy Efficiency Projects/Upgrades (Non-LEED)	17	**20**		**20**		*9*	*4*
Fuel Cells	0.5					*0*	
Electric Vehicle Charging Equipment	15	**17**		**17**	**21**	*10*	*4*
Solar/Photovoltaics	9			**10**			*1*
LEED Projects	7			**7**			*3*
Smart or Net Metering	4				**10**		*0.6*
Geothermal	3		**7**	**4**			*0.7*
Cogeneration	3		**5**	**4**		*1*	*0.7*
Energy Audits (Including Thermal Imaging)	2						
Wind Generation	2						
Energy Storage	3						*0*
Smart Grid Technology	1				**3**	*0*	*0*
Microgrids	0.8					*0*	*0*
Pre-Assembly/Pre-Fabrication of Electrical Components	6						
HVAC (Mechanical)	13	**16**	**18**	**16**	*5*	*2*	*6*
Water Utilities or Waste Water Treatment Plants	**N/A**						
[NEW] Maintenance/Service/Repair (Any Electrical)	**49**	**59**		**58**		*22*	*13*
Any HVAC (HVAC ***or*** Mechanical)	**24**	**30**		**29**	*19*	*7*	*9*
HVAC Controls *and* Mechanical	**8**	**11**	**13**	**11**	*4*	*0*	*2*
Any Low Voltage	**69**	**83**	**75**	**81**	*57*	*35*	*26*
Only 1 of 6	9	11	8	10	*7*	*7*	*3*
2 of 6	13	**17**	12	16	*7*	*7*	*3*
3 of 6	14	**17**	17	17	**14>**	*7*	*6*
4 of 6	15	**17**	20	17	**11>**	6	*7*
5 of 6	14	16	**16**	16	**12**	8	*7*
All 6	10	12	11	12	11>	4	*2*
Number of Project Types	**75**	**90**	**81**	**88**	**62**	**38**	**27**
Mentioned 1-9 Types	38	**48>**	34	**45>**	**28>**	**20>**	*12*
Mentioned 10-11 Types	12	14	15	**14>**	9	6>	*2*
Mentioned 12+ Project Types	25	28	32	**29>**	25>	12	*13*
Mentioned 12-19	21	25	26	**25>**	19>	9	*11*
Mentioned 20 + (out of 43) Project Types	4	3	<6	4	6	3	*2*

Low Voltage: Firm's Active Engagement in Systems Integration or Data Centers

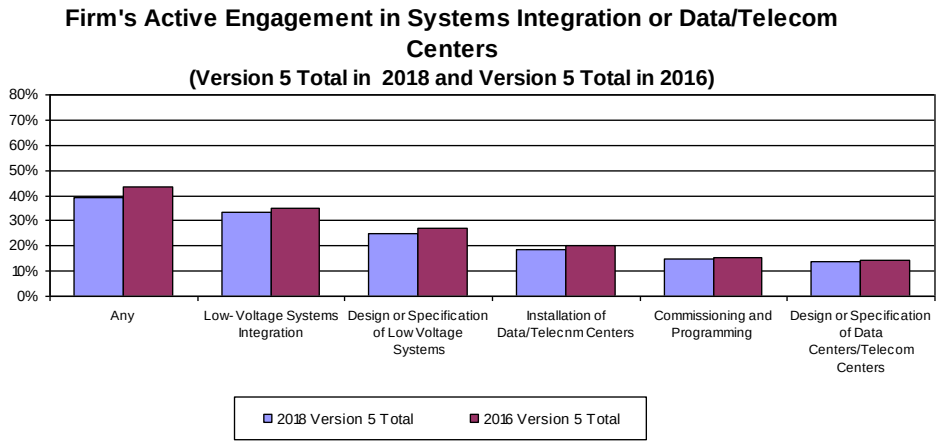
To put the following results into context, across the total sample 95% perform low voltage work.

In the 2018 Profile Study, 10% of firms said that they currently have a separate low voltage division, statistically unchanged from 2016, when it was also 10%. As was the case two and four years ago, larger firms (those with 10+ employees) are more likely to have a separate low voltage divisions (25% in both 2018 and 2016. Larger firms are also more likely to plan to add a low-voltage division in the next 1-2 years (8% vs. 5% for the total sample) This was also the case in 2016. [Separate low voltage division findings are not illustrated.]

There are no significant differences from two years ago. About 4 in 10 electrical contracting firms are actively engaged in Systems Integration and/or Data/Telecom Centers.

Low-Voltage Systems Integration was mentioned most often (34%). Design or Specification of Low Voltage Systems, received the next the next most mentions (25%). Almost 20% of firms said that they installed data or telecom centers, 15% perform Commissioning and Programming and 14% were involved in the design or specification of data or telecom centers

Table is Table Section 127



Roles Played by Firm in Integrated Systems, continued

Electrical contractors were asked to indicate the extent to which they specify, install or both specify **and** install selected integrated systems.

- 63% of electrical contractors say that they both **specify *and* install Lighting**. This is more than double the percent that only install.
- For most of the other integrated systems, the percent that both specify **and** install or only specify is in the range of 20% to 25%, with the exception of HVAC (not including controls) where it is 11%.

Starts at Table 170

Roles Played by Firm in Integrated Systems
2018 Profile Study

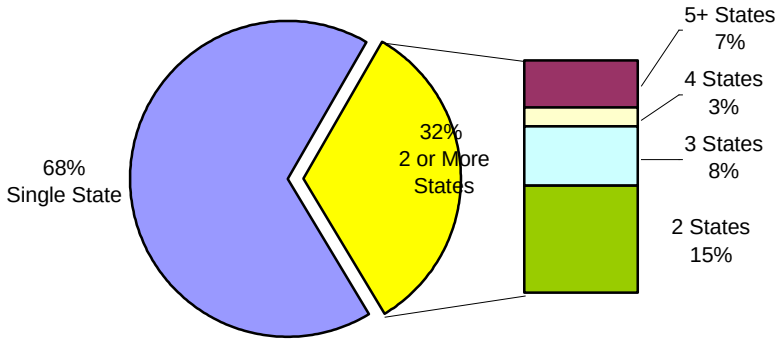
	Specify *Only*	Install *Only*	Specify *and* Install	Don't Work in This Category	No Answer
Version 7 Base (243)	%	%	%	%	%
Security	1	27	19	44	8
Fire/Life Safety	2	30	30	31	7
Lighting (including Controls)	2	25	63	6	5
Communications (VDV, etc.)	3	24	25	39	10
Building Controls (including HVAC)	2	32	17	40	9
HVAC (Not Including Controls)	3	22	11	56	9

▲*"WHERE DO CONTRACTORS PERFORM THE WORK?*

Number of States In Which Electrical Contracting Firm Works

About one-third of electrical contracting firms perform their work in multiple states, suggesting, as noted in the past, that there may be issues of licensing and certification. The proportion working in 2 or more states is unchanged over the past three tracking waves.

Number of States in Which Electrical Contracting Firm Performs Its Work
(2018 Profile Study)



Q 1b N=1597 Table is Table 3, Pg 20

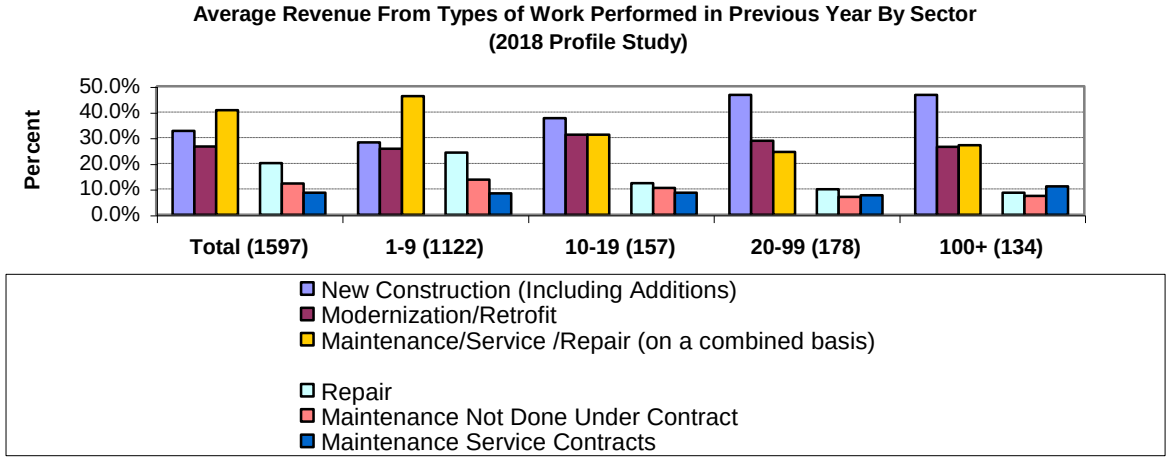
Not surprisingly, larger firms are more likely to work in multiple states. This was also the case in earlier Profile Studies.

	Total	1-4	5-9	1-9	10+
Work in 2+ States (2018)	33%	21%	<35%	24%	**<55%**
Work in 2+ States (2016)	32%	22%	30%	24%	**<54%**
Work in 2+ States (2014)	31%	20%	<37%	23%	**<55%**

Types of Work: By Sector (New Construction Vs. Modernization Vs. Maintenance and Repair)

On average, 41% of electrical contractor revenue comes from Maintenance/Service or Repair, which is statistically unchanged versus 2016; 33% of average revenue comes from New Construction, also unchanged compared with 2016.
27% comes from or Modernization/Retrofit, unchanged since 2014. New Construction, which accounted for 43% of average revenue in 2007 (not shown), has not yet recovered.

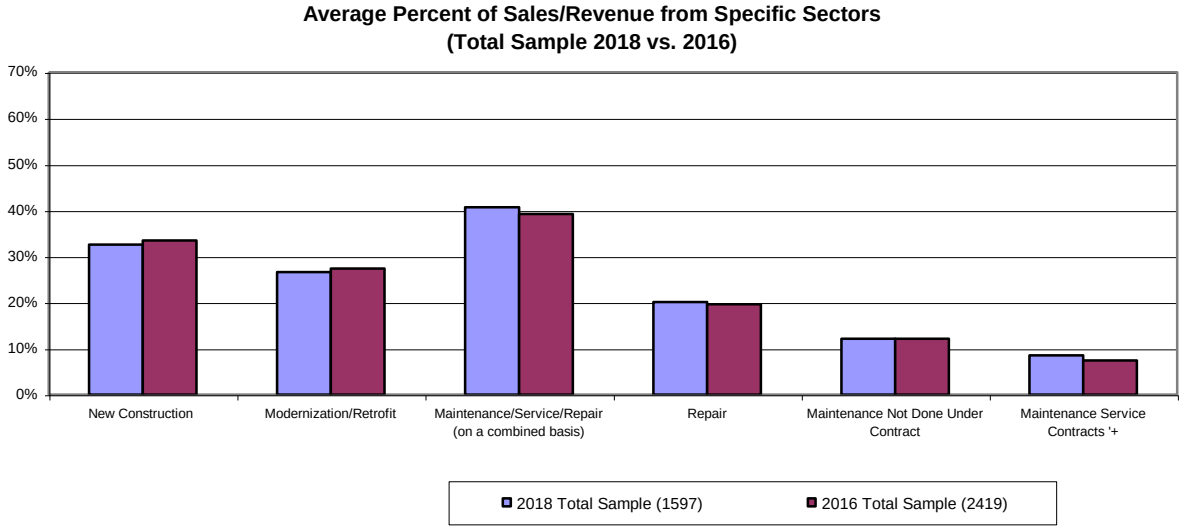
- As was the case in earlier Profile studies, New Construction (the blue bar) plays a proportionally larger role to firms with 10+ employees than to smaller firms, while Maintenance/Service/Repair – on a combined basis -- (the gold bar) accounts for a proportionally larger share of revenue among smaller firms. However, with the exception of firms with 20-99 employees, where it is low for a large firm, Maintenance *Contracts* continue to play a proportionately bigger role to larger companies.
    - Maintenance *Contracts* continue to play a proportionately bigger role to the very largest firms.



Q 5 Total Sample N=1597 (base sizes in parentheses above) **From data Tables 26-31**

There is only one significant difference among the total sample: On average, revenue from Maintenance Service Contracts increased compared to two years ago among the total sample and among firms with 1-9 employees (not illustrated in bar chart).

Statistically significant differences (2018 compared with 2016) are shown below via + or – next to label



	Total		1-9 Employees		10+ Employees	
	2018	**2016**	**2018**	**2016**	**2018**	**2016**
New Construction	**32.6=**	**33.5%**	28.2=	29.1%	43.6%=	44.6%
Modernization/Retrofit	26.6=	27.4%	25.7=	27.2%	28.9=	27.9%
Maintenance/Service/Repair	40.7=	39.2%	**46.1>**	43.7%	27.5	27.5%
Repair	20.1=	19.6%	24.2=	23.4%	10.4%	9.7%
Maintenance/Service Contracts	8.5%>	7.4	8.3>	6.5	8.9	9.8
Maintenance Not Done Under Contract	12.1	12.1	13.6	13.8	8.2	8

Types of Electrical Projects: Average Sources of Revenue

- For the first time since at least 2004, Electric Power Transmission and Distribution (formerly called Electrical/Power Distribution) no longer accounts for the largest *single* percent of company sales. Compared with two years ago, it dropped significantly and dramatically to 25.4% from 43% in 2016. Rather, Lighting edged into first place and now accounts for an average of almost 30% of company revenue. It rose significantly from 21% on average in 2016.
    - Although Electric Power Transmission and Distribution declined sharply compared with two years earlier, the average percent of revenue from Electrical/Power Distribution had been dropping steadily since 2004 when it was 69% (not shown).

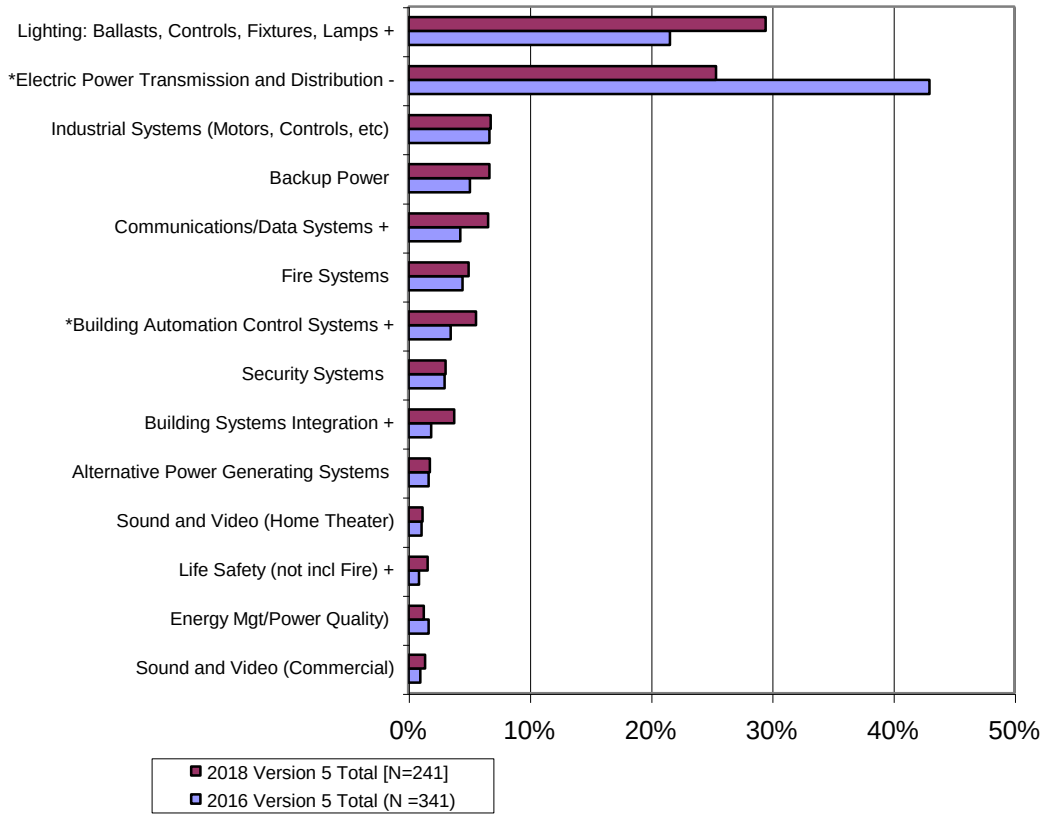
- If Electric Power Transmission and Distribution dropped an average of almost 18 percentage points, what made up the difference?
        - In contrast, Lighting rose an average of almost 8 percentage points; Communications Systems, Building Systems Integration and Building Automation Control Systems each rose an average of about 2% each. These differences, by themselves, make up 14% of the 18%

  Subgroups changes vs. two years ago:

    - Electrical Power Transmission and Distribution *declined* among the total sample, driven by firms with 1-9 employees
    - Lighting *rose* among the total sample and among firms with both 1-9 and 10+ employees
    - Communications Systems, Building Automation Control Systems, Building Systems Integration, and Life Safety Systems each rose among the total sample driven increases among firms with 1-9 employees.
    - Only one category, Energy Management, rose among firms with 1-9 employees but not among the total sample.

  [Only the total sample is shown on the next page]

Sources of Revenue -- Trended (2018 vs. 2016)



+ and – indicate significant changes at the 90% level of confidence vs. the 2016 Profile Study (each reporting on the previous year)

* Indicates slight wording change versus two years earlier

As will be shown on the next page, there are relatively few significant differences in average revenue by company size

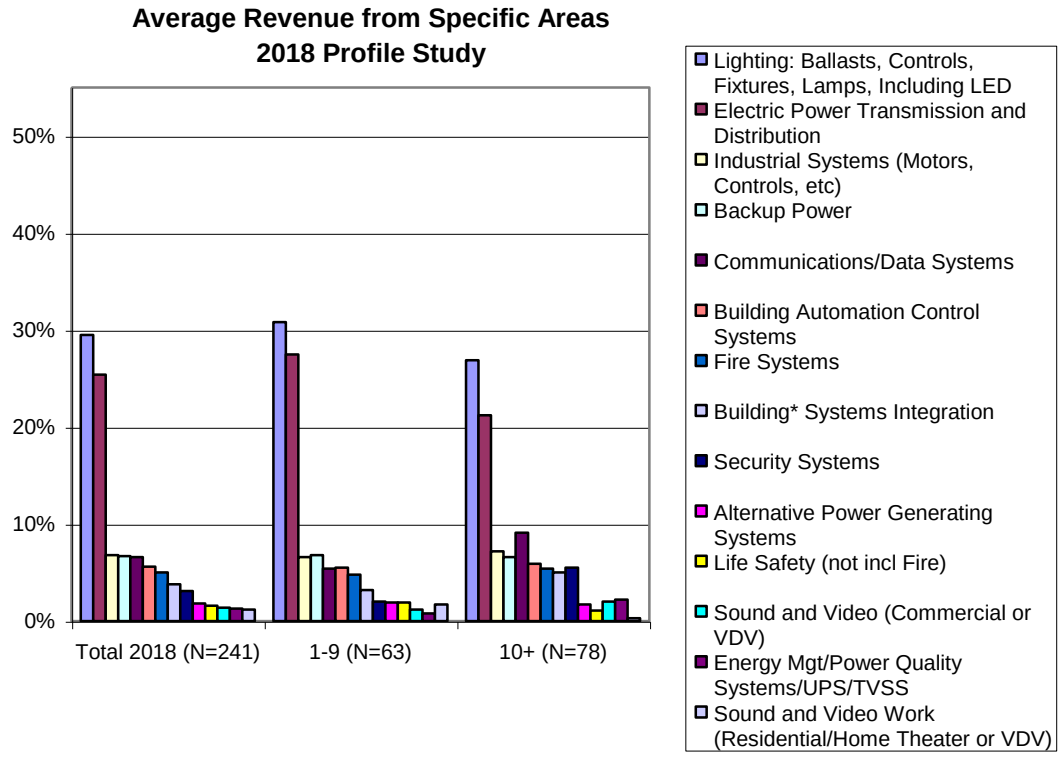
Table is Table 168, Q14A

There are relatively few significant differences in average revenue by company size. While revenue from Electric Power Transmission and Distribution and Lighting are directionally higher among smaller firms than their larger counterparts, the differences are not statistically significant. In contrast, in 2016, Lighting and Back Up Power accounted for significantly more revenue to firms with 1-9 employees than their larger counterparts in the 2016 Profile Study, while in 2016 there was no longer a difference in the case of Electric Power.

These are the only significant differences in average revenue between companies with 1-9 and 10+ employees:

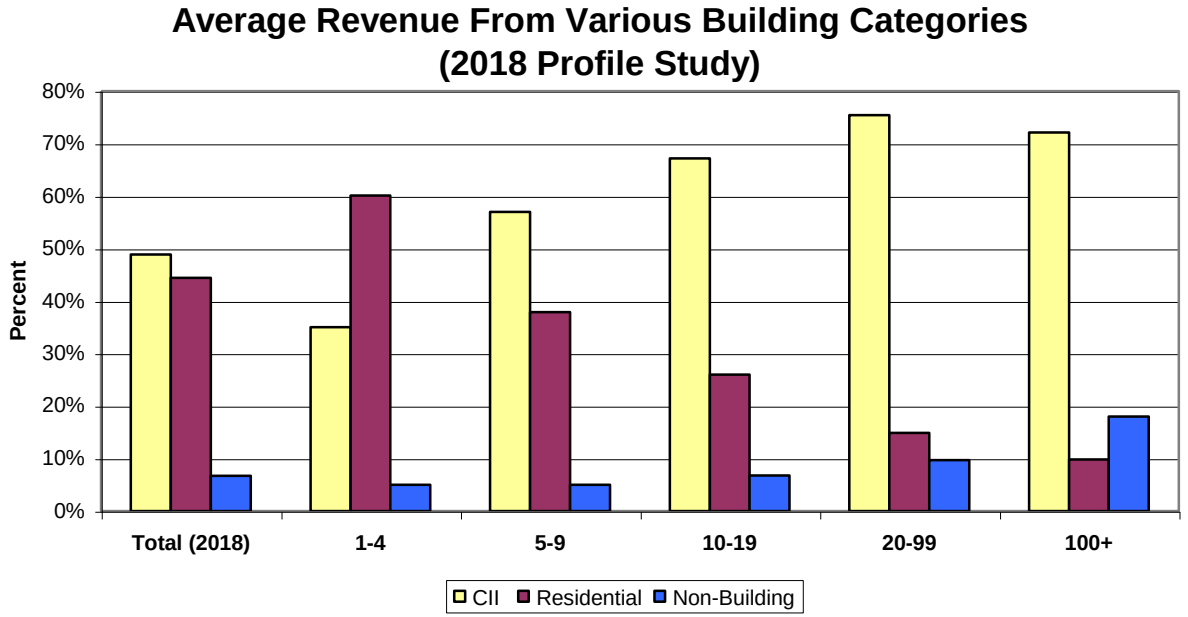
- Communications/Data Systems, Security Systems and Energy Management/Power Quality provide more revenue on average to larger firms (10+ employees compared with firms with 1-9 employees).
- Sound and Video (Residential/Home Theater or VDV) provides more revenue on average to smaller firms

Table 124



Work in Various Building Categories (Residential vs. CII and Non-Building)

Across the total sample, electrical contractors continue to get more of their average revenue from CII (Commercial, Industrial, Institutional and Public Places), 49% on average, than from Residential projects, 44% on average. Non-Building projects (Transportation/Lighting and Utility) account for about 7% of the contractors' business.



Q4_ N=1597

CII = **Commercial** (Offices, Stores, Hospitality, etc); **Institutional** (Schools/Hospitals/Stadiums/Parks/Terminal/Cultural/Correctional, etc); **Industrial** (Manufacturing Plants/Process Industries/Factories/Warehouses, etc); **Residential**: Single Family; Multifamily (1-5 stories); Multifamily (6+ stories) **Non-Building:** Line Work (Overhead/Underground Construction/Transmission & Distribution/Maintenance and Repair, Transportation Lighting, and Communications (Airport Runway/Highway/Street Lighting including Parking Garages and Traffic Controls/Electric Signage/Traffic Calming Signs); Power Generation and/or Substations; Distributed Generation/Alternative Energy; Smart Grid; Electric Vehicle Charging Equipment; Energy Storage was first added in 2016.

Table is Table 23, Pgs. 93-95

Work in Various Building Categories (Residential vs. CII and Non-Building), continued

- Except as shown below, compared with two years earlier, the average percentage of revenue declined from CII (from 51% to 49%) but rose from residential construction (from 42% to 44%). In both cases the difference was about two percentage points and was driven by firms with 1-9 employees.
    - There was no difference in the average revenue derived from non-building.

	Average Revenue in Previous Year From Specific Categories											
	Total		**1-9**		**10+**		**10-19**		**20-99**		**100+**	
	2018	**2016**	**2018**	**2016**	**2018**	**2016**	**2018**	**2016**	**2018**	**2016**	**2018**	**2016**
	(1597)	(2419)	(1122)	(1744)	(469)	(665)	(157)	(223)	(178)	(269)	(134)	(173)
CII	48.9%	**<51%**	39.6%	**<42.8%**	71.7%	72.2	67.2%	69%	75.4%	74.4%	72.1	72.5%
Residential	**44.4%>**	42.2%	**55.4%>**	52.3%	17.2	16.3	26%	24.9%	14.9%	15.4%	9.8%	7%
Non-Building	6.7% =	6.8%	5%	4.9%	11.1	11.5	6.8%	6%	9.7	10.2%	18%	20.6%

> or < indicates significant difference in the direction of the arrow

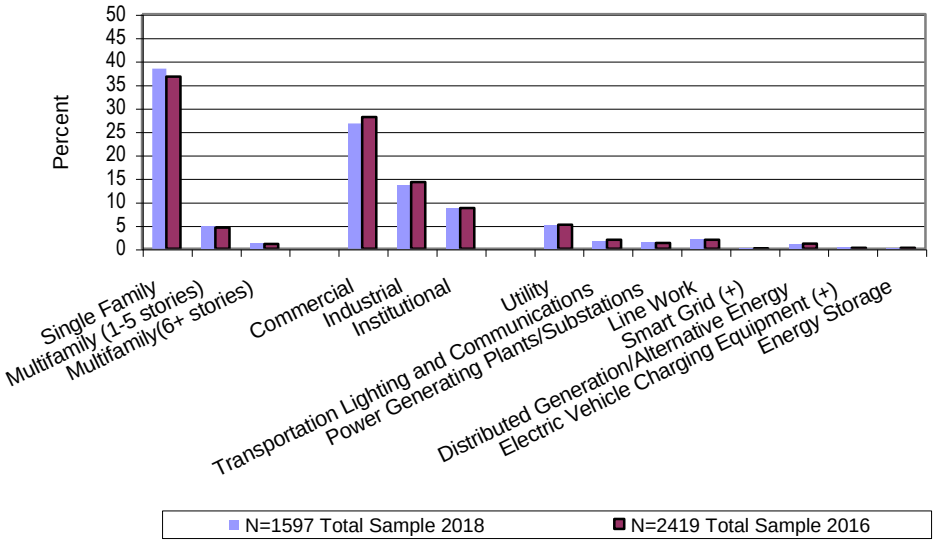
Types of Residential and CII Work Performed

- Although on average, the greatest portion of electrical contractors' revenue comes from CII work, Single Family housing accounts for the *single* largest source of revenue (38.4% in the 2018 Profile Study). Also within the housing category, a higher percentage of revenue comes from Multi-Family housing with 1-5 stories compared with taller Residential buildings. This was also the case two and four years ago.

- As was also the case for at least the last six years, within the broad CII category, a greater percentage of electrical contractors' revenue is from Commercial construction (26.7%) than from Industrial (13.6%) or Institutional projects (8.6%).

    - In the 2018 Profile Study, compared with the 2016 Profile Study, only two individual project types – each small -- changed significantly: a significantly higher percentage of average revenue now comes from Smart Grids and/or Electrical Vehicle Charging Equipment than was the case in the 2016 Profile Study. There are no other changes.

Average Percentage of Business in Previous Year From Specific Categories
(Total Sample 2018 vs. 2016)



(+) Denotes significantly higher than two years earlier (2018 v. 2016 Profile Study)

Table is Table 23, Pgs.76 ff, section 24

As noted in previous Profile reports, while Single Family projects account for a high percentage of revenue across the total sample, this type of work is extremely important to electrical contracting firms with 1-9 employees. On average, these small firms derive almost one-half of their revenue from Single Family projects.

- Electrical contracting firms with 10-99 employees derive the greatest percentage of their revenue from Commercial projects.
    - In addition, electrical contracting firms with 100+ employees get a disproportionate percentage of their revenue from Industrial and Institutional projects and from Utility/Non-Building work.

Average Percent of Business in Previous Year From Specific Categories
2018 Profile Study

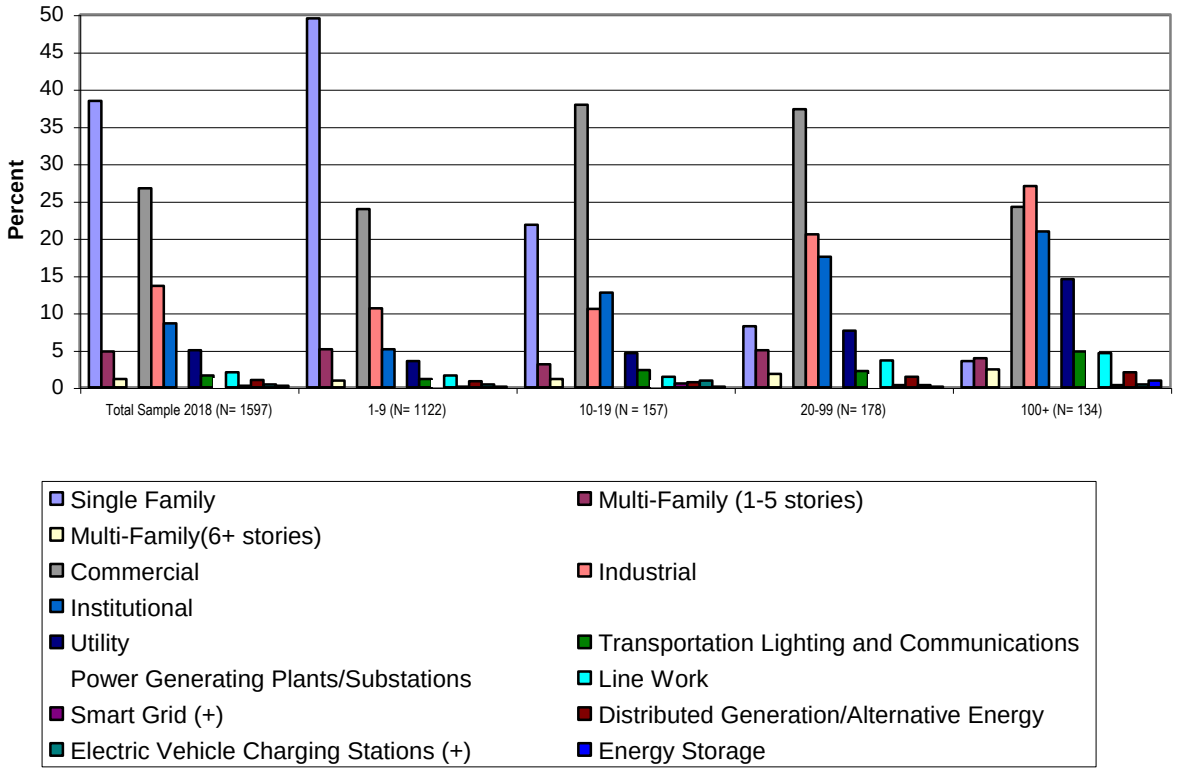


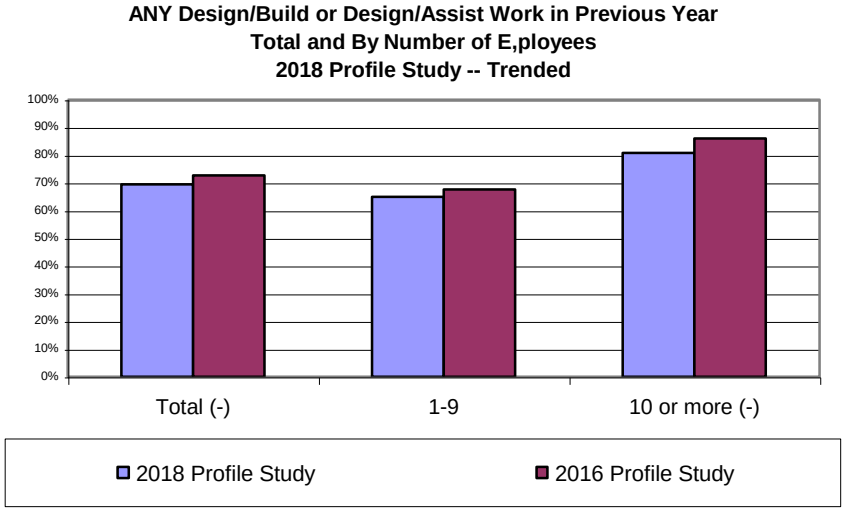
Table is Table 23, Pgs. 93-96

▲ *"HOW" DO CONTRACTORS PERFORM THEIR WORK?*

Roles in Specification/Types of Project Delivery (Design/Build or Design/Assist)

Across the total sample, 69% of electrical contractors performed (**any**) Design/Build or Design/Assist work in the previous year. As in the past, larger firms are even more likely than smaller firms to have engaged in D/B or D/A work:

- While 65% of firms with 1-9 employees performed any DB or DA work in 2017, **any** D/B//D/A work was performed by 81% of firms with 10+ employees.
    - Compared to two years earlier, levels of doing **any** D/B//D/A posted a significant decline among the total sample, driven by a significant decrease among firms with 10+ employees.



Q9a 2018 Sample = 1597; 2016 Sample = 2419

Table is Table 51, Pg. 218

The chart on the previous page shows whether the electrical contractor does **any** Design/Build or Assist work. The next few pages focus on the *amount* of work done, expressed as average revenue.

Overall, an average of 41% of electrical contractors' revenue was done on either a Design/Build or Design/Assist basis. This is statistically unchanged compared with the 2016 average of 43%. (As in the past, the vast majority continues to be done as Design/Build --30%-- rather than Design/Assist --11%).

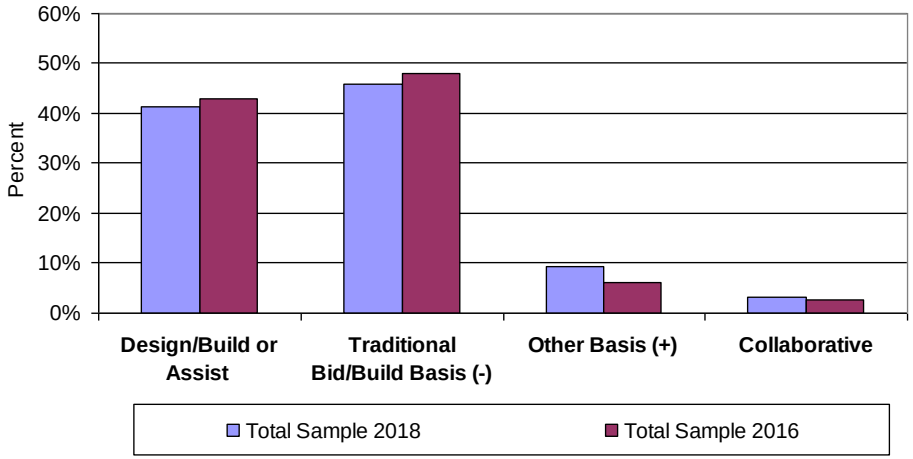
About one-half of electrical contractors' revenue comes from Traditional Bid/Build projects (46%, down significantly from 48% in 2016).

"Other delivery methods", which accounted for 9% of project delivery revenue, posted a sharp increase from its 2016 level of 6%. When asked to specify, other delivery methods was generally described as "time and materials" or some aspect of "maintenance, service or repair". These two categories should be pre-listed choices in the next wave of the survey.

Across the total sample, Collaborative building accounts 3.2% of average revenue, statistically unchanged compared with 2016.

- To put this into context, across the total sample, 12% continue to say that they have done **any** collaborative building (18% among firms with 10-19 employees and about 38% among firms with 100+ employees), again, making it an area to watch in the years to come. [**Any** collaborative building is not shown.]

Average Percent of Revenue from Projects Involving This Type of Project Delivery



Q 9a 2018 Sample = 1596 2016 Sample = 2419
(-) Indicates a significant decline vs. 2016; (+) Indicates a significant increase vs. 2016 Table is Table 50, Pgs. 227-228

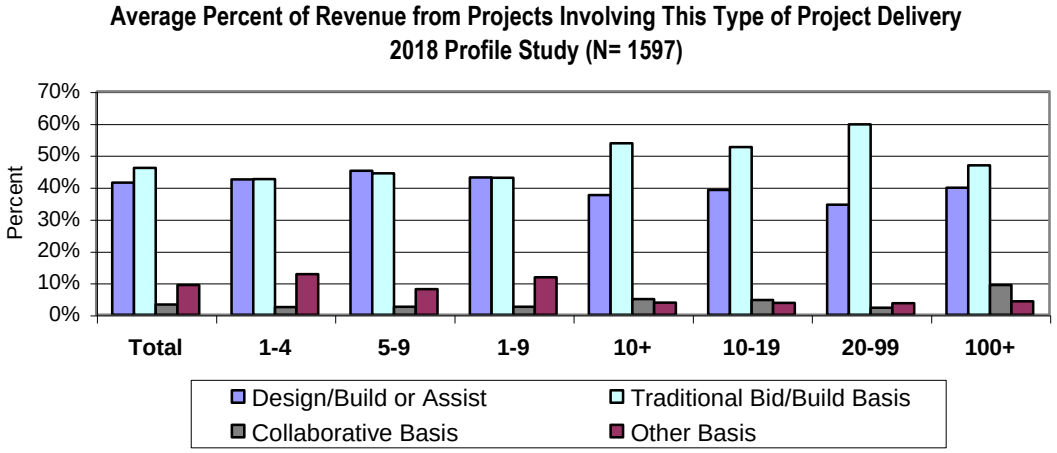
In the 2018 Profile Study, the average percent of revenue from Design/Build or Design/Assist continues to be significantly higher among firms with 1-9 employees. In contrast, average revenue from Traditional Bid/Build continues to be significantly higher among larger firms – especially those with 10-99 employees.

Average revenue from Collaborative is about twice as high among firms with 10+ compared with those with 1-9 employees; As w shown below, average revenue among larger firms is driven by firms with 100+ employees

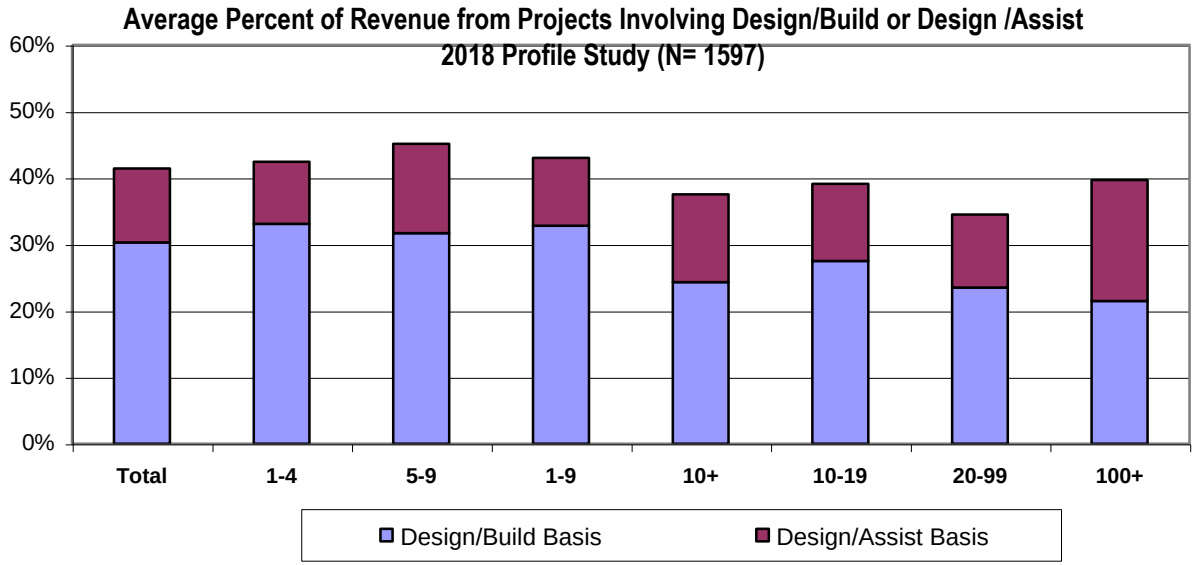
- Not only does Collaborative building continue to account for more revenue on average among larger firms (4.9% among firms with 10+ employees) compared with smaller firms (2.5% of revenue among firms with 1-9 employees), this is even more the case among firms with 100+ employees, where the average revenue from collaborative building was 9.3%. Further, the average revenue among firms with 100+ employees almost doubled compared with two years earlier, when it was 5.9%. This increase is statistically significant.

In contrast, some "Other" basis is about three times as high among firms with 1-9 employees compared with those with 10+ employees. "Other" includes time and materials and maintenance/service and repair.

[Earlier years are not illustrated]



Note the relative importance of Design/*Assist* in the 2018 Profile Study among firms with 100+ employees and of Design/*Build* to firms with 1 - 9 employees.



Tables are Table 50, Pgs. 227-228

BIM (Building Information Modeling)

Electrical contractors were asked to estimate the percentage of the time that they or someone in their firm uses BIM (Building Information Modeling). This question was first asked in the 2012 Profile Study.

As shown below, across the total sample, the use of BIM has been fairly steady over the past four Profile Studies: **any** use is in the range of 22%; average use is in the 6% to 7% range.

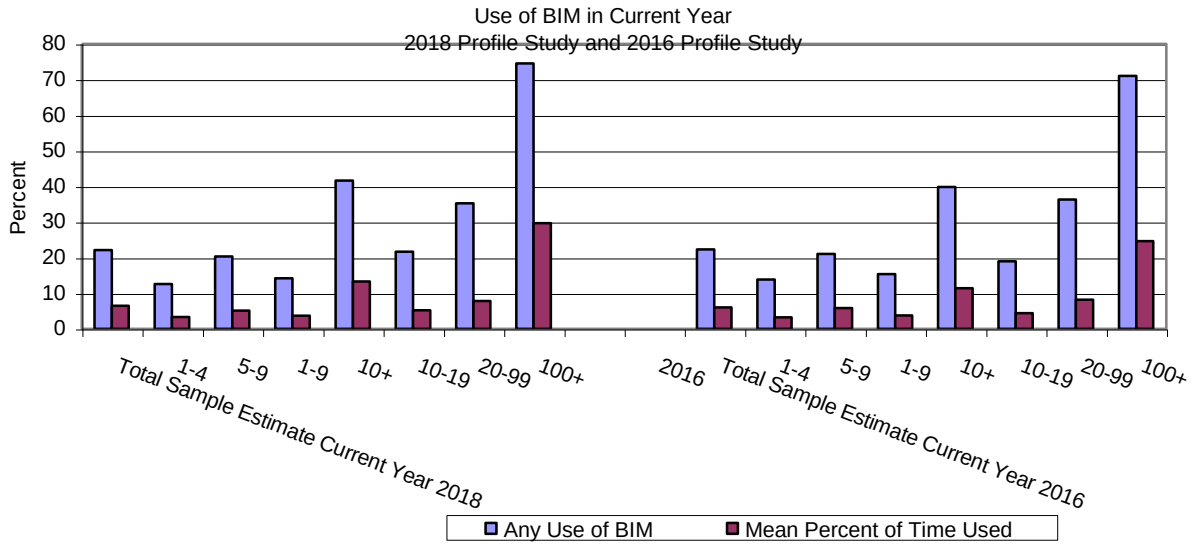
- Neither any use nor the mean revenue from BIM has changed significantly compared to two years earlier.

Use of Building Information Modeling (BIM)								
	2018		2016		2014		2012	
	Any Use	Average	Any Use	Average	Any Use	Average	Any Use	Average
Survey Year (Current Use)	22.1%	6.5%	22.3%	6.0%	23.7%	7.1%	20%	5.8%

Table is Table 52, Pgs. 231-232

However, as we mentioned in the 2016 Profile Study, looking at BIM usage among the total sample obscures a larger finding: that while BIM usage is low among firms with 1 - 4 employees, it increases dramatically as firm size increases. The increase in use and average revenue is evident among firms as small as 5 - 9 employees. In fact, firms with 5-9 and 10-19 are similar in terms of their use (**any** use and average revenue). Firms with 20 - 99 employees form a second, higher level of use and firms with 100+ employees use BIM the most and derive the highest average revenue from BIM.

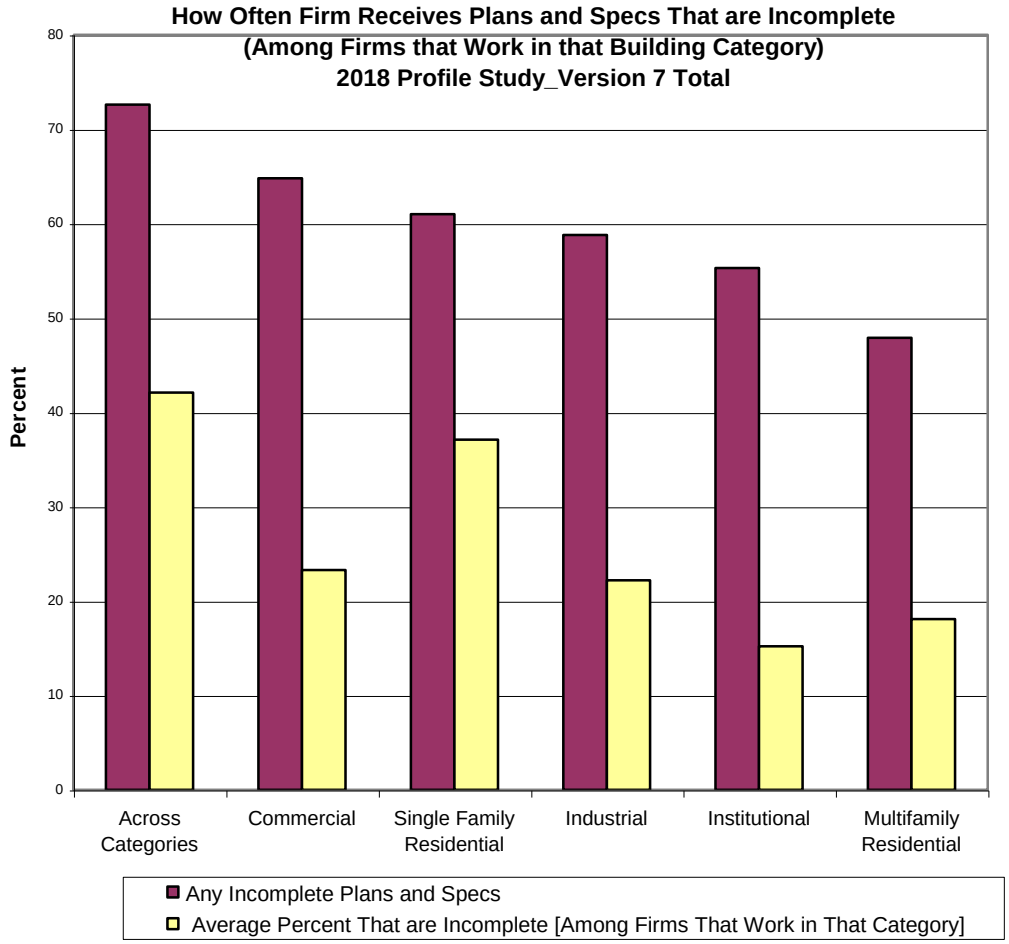
- There are no statistically significant changes either in any use or in average use between 2016 and 2018.



Completeness of Plans and Specifications

Receipt of incomplete plans and specs continues to be quite prevalent. 73% of firms have received ANY incomplete plans and specs in 2017, statistically unchanged from two years earlier, when it was 72%. On average, 42.1% of the plans and specs received were incomplete, statistically unchanged from 40.4% two years earlier.

Although upwards of 40% of electrical contractors report receiving **any** incomplete plans and specs, the average does vary by building type. It is highest in single-family construction, lower in the case of commercial, industrial or multifamily projects but lowest in the case of institutional work. This finding is not entirely unexpected as institutional work has a strong government component and therefore perhaps a higher degree of explicit specification.


How Often Firm Receives Plans and Specs That are Incomplete
(Among Firms that Work in that Building Category)
2018 Profile Study_Version 7 Total
Percent
80
70
60
50
40
30
20
10
0
Across Categories
Commercial
Single Family Residential
Industrial
Institutional
Multifamily Residential
Any Incomplete Plans and Specs
Average Percent That are Incomplete [Among Firms That Work in That Category]

Role of Engineers within Electrical Contracting Firms

Starting in the 2016 Profile Study, electrical contractors were asked about the professional relationship(s) that their firm has with engineers:

- Consulting Relationship
- On staff or in a separate engineering division
    - These questions were asked independent of each other since we did not want to assume that one type of relationship would rule out the other.

Across the total sample, almost one-half of firms (47%) have a professional relationship with an engineer, statistically unchanged from the 2016 Profile Study level of 42%. While *consulting* relationships continue to be more prevalent (42%), 13% report having an engineer on staff and/or having a separate engineering division. About one in ten firms (8%) have **both** a consulting relationship as well as having an engineer on staff or a separate engineering division. Not surprisingly, these types of relationships are far more common among large firms and the prevalence rises with firm size. However, even among firms with 1-4 employees, more than one-quarter has a professional relationship with an engineer. All of the percentages cited above are statistically unchanged compared with 2016 Profile findings.

The high prevalence of working with engineers speaks to the complexity of much of the work performed by electrical contractors.

	Professional Relationship With Engineer(s)								
		Number of Employees							
	TOTAL	**1-4**	**5-9**		**1-9**	**10+**	**10-19**	**20-99**	**100+**
	243	136	35*		171	70	23*	27*	20*
	%	%	%		%	%	%	%	%
Any Professional Relationship	47	31	<54		36	<73	61	<67	<95
Consulting	42	29	<49		33	<63	52	<63	<75
On staff/separate Division	13	4	<14		6	<30	13	15	<70
Both	8	2	<9		4	<20	4	11	<50

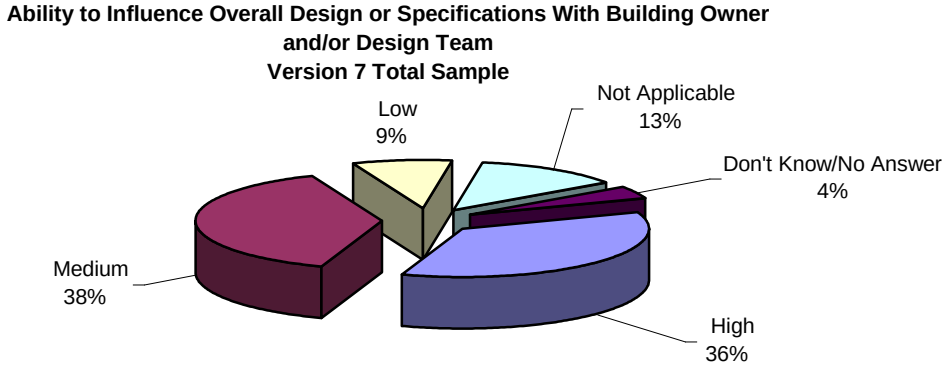
* Caution, small base size; percents in shaded cells are more reliable, particularly if the reciprocal (e.g., 1-4 vs.5-9) has a larger base size

Project Collaboration/Level of Influence

As has been the case in recent Profile Studies, about three-quarters of electrical contractors report having a “high” or “medium” ability to influence the overall electrical design or specifications with building owners and/or design team members

- About 4 in 10 describe their level of influence as "high" -- 36% -- while an equal number -- 38% -- characterize their level of influence as "medium."
- There are only a few differences by company size (not shown).
    - Those in firms with 1- 9 employees are more likely than those in firms with 10+ employees to report a “high” level of influence (39% in firms with 1-9 employees vs. 27% in firms with 10+ employees). This difference first emerged in the 2012 wave.
    - In contrast, larger companies (those with 10+ employees are more likely than average to report a “medium” ability to influence the overall electrical design or specifications (50%, compared with 34% among firms with 1-9 employees). Again, this finding is consistent with results from recent Profile Studies.

2018 Profile Study



2018 Profile Study: Q 15a Version 7 Total = 243 Table 163, pg 487

Electrical contractors were also asked about their current level of collaboration with these key trades: Mechanical, HVAC, Plumbing and Systems Integrator From Other Trades.

- As was the case two years ago, project collaboration is higher with mechanical and HVAC trades than with plumbing or systems integrators from other trades.
    - There are no meaningful differences by number of employees.

Current Level of Project Collaboration 2018 Profile Study					
	Building Owner/Other Design Team Members	Mechanical	HVAC	Plumbing	Systems Integrator from Other Trades
Base: Version 7 (N=243)	%	%	%	%	%
High or Medium	74	49	48	36	36
High	36	14	16	11	13
Medium	38	35	32	25	23
Low	9	24	23	26	19
Not Applicable	13	22	25	33	38
Don't Know/No Answer	4	5	4	5	7

Table is taken from Tables 163 ff09

Building Stage That Electrical Contracting Firm Gets Involved in Project Collaboration

Starting with the 2016 Profile Study, electrical contractors were asked at what stage their firm typically gets involved in Project Collaboration. In the 2018 Profile Study, "Construction" and "It depends" were tied at about one-third each. 20% say that they get involved in the "Pre-Construction" phase while 10% say that they get involved in the "Project Design" stage. Only 1% say that they get involved in "Procurement."

- There are no significant differences between firms with 1-9 and 10+ employees in terms of when they typically get involved in project collaboration.

Building Stage in Which EC Firm Gets Involved in Project Collaboration		
	Total 2018	Total 2016
Base: Version 7	(243)	(326)
	%	%
Project Design	10	13
Pre-Construction	20	24
Procurement	1	1
Construction	34	23
It depends	32	35
Don't Know/No Answer	3	4

Q15c Table 168

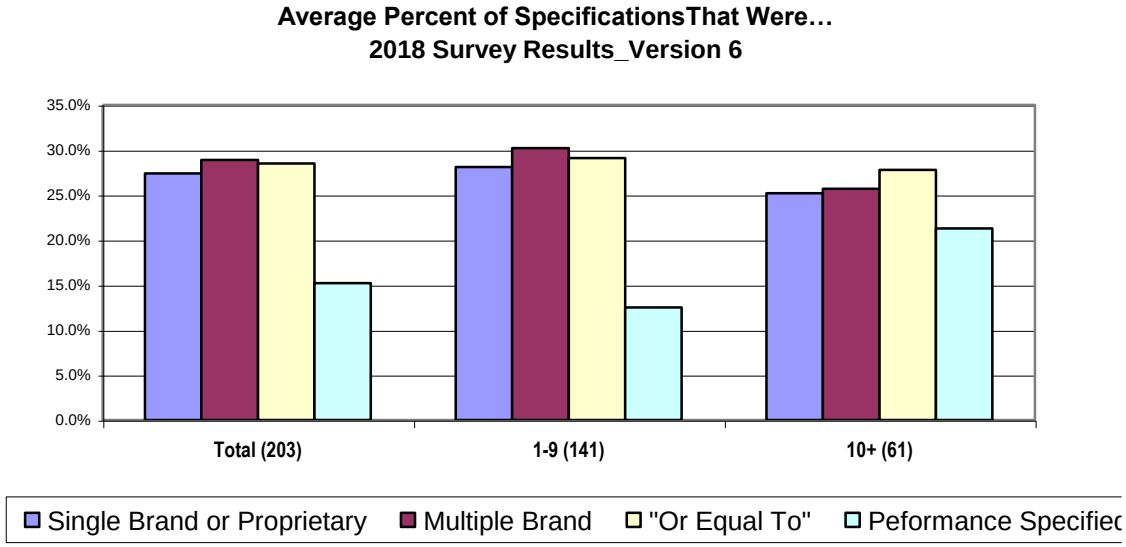
Across the total sample, 20% say that they now get involved *earlier* in the design collaboration; 57% report *no change* and 8% say that they now get involved *later* in the process, compared with 3- 5 years earlier. These percentages are statistically unchanged compared with the 2016 Profile Study findings. The remaining approximately 15% say either that this question is not applicable to them or they didn't answer the question.

- As was the case in 2016, in this wave, there is no difference by number of employees.
  [V7Q15d, Table 169]

Brand Specification Options

Respondents were shown a list of four options and were asked what percent of the specifications that their company receives fall into each category. On average, a "single" brand is specified about one-quarter of the time. In all other cases, other factors -- multiple brands, "or equal to" or performance specified – come into play.

- With the exception of performance specified, which is significantly higher among firms with 10+ employees, there is no statistically significant difference between firms with 1-9 and 10+ employees in terms of brand specification options.
    - Performance specified also jumped significantly among firms with 10+ employees from two years earlier: from 13.9% to 21.3% [2016 results are not shown].

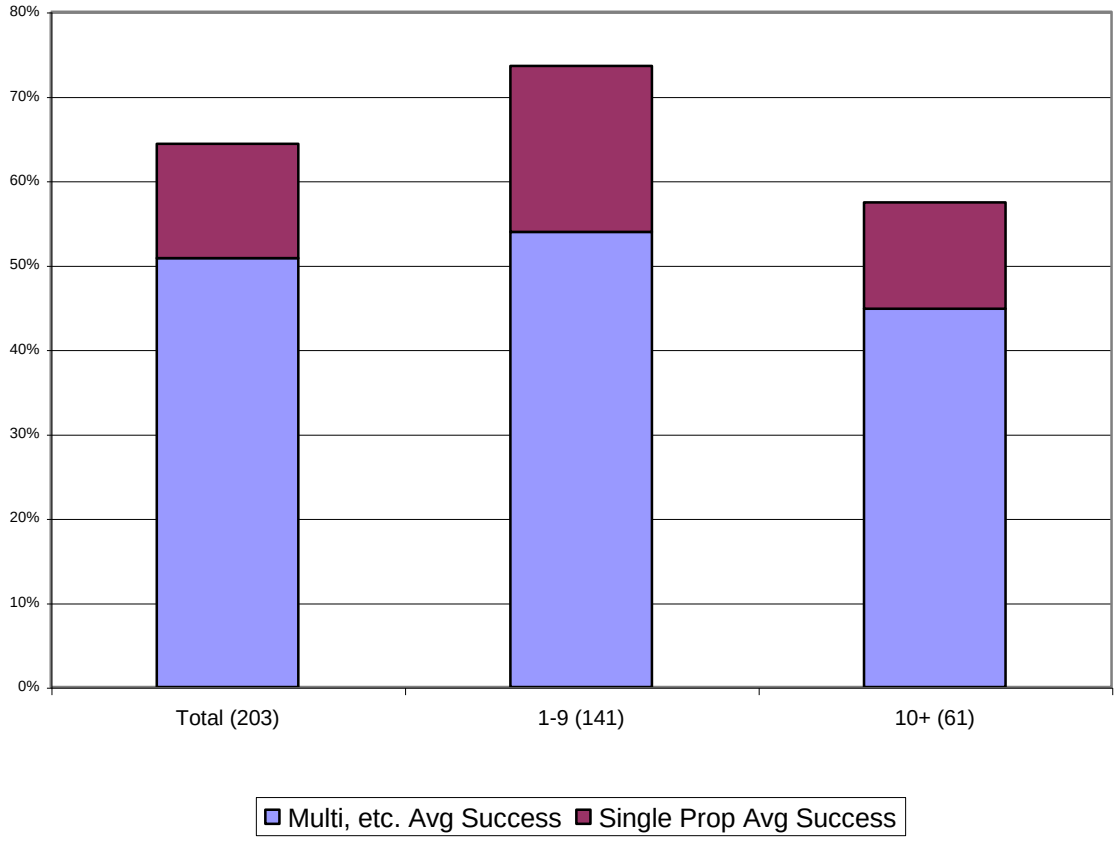


Version 6 Q14 N=203

Table is Table 134

Respondents were then asked how much discretion they have in making a brand substitution. Overall, contractors are able to make brand substitutions about two-thirds of the time; 74% in the case of firms with 1-9 employees and 58% in the case of firms with 10+employees.

Average Extent of Electrical Contractor Influence In Brand Selection
2018 Profile Survey
Version 6 Total



"Where a 'single or proprietary' specification is indicated, what percentage of the time are you or someone in your firm able to successfully make a substitution?"
"Where 'multiple or equal or performance' specification is indicated, what percentage of the time do you or someone in your firm make the brand decision for installation?"
N=203 TABLES 136, 142

Main Reasons for Original Brand Selection and Substitution

Original Brand Selection: Among the total sample, Availability and Price trump all other attributes as a top-3 reason for original brand selection. Note that as a first choice, Availability completely overshadows all of the other attributes. (This has been the case since at least the 2014 Profile Study.)

Compatibility with Existing Systems, which was first asked in 2014, had resonance with 32% of electrical contractors. It is now comparable with Durability, Prior Experience and Ease of Installation and is a little higher than Made in America or Manufacturer Reputation.

Specific Features, Energy Efficiency, Real-Time Technical Support, Manufacturer Support and Training and Word of Mouth were chosen by between around 10% or less of electrical contractors.

Once again, it is somewhat surprising that Energy Efficiency does not play a larger role as a top-3 reason for original brand selection.

- One hypothesis is that energy efficiency takes place long after the project has been specified and installed and there is no mechanism for the electrical contractor to be tied to the energy savings.

- Another hypothesis is that energy efficiency is so integral to electrical products that it is not seen as a separate feature.

Top 3 Reasons for Original Brand Selection
Base: 2018 Version 6 Total (N= 203)

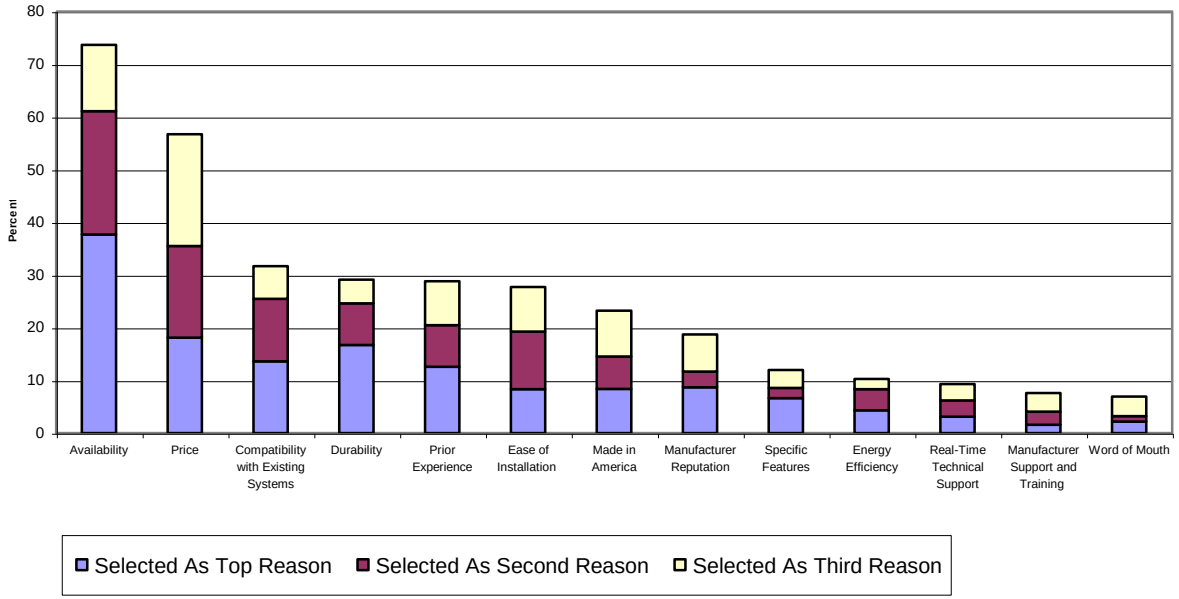
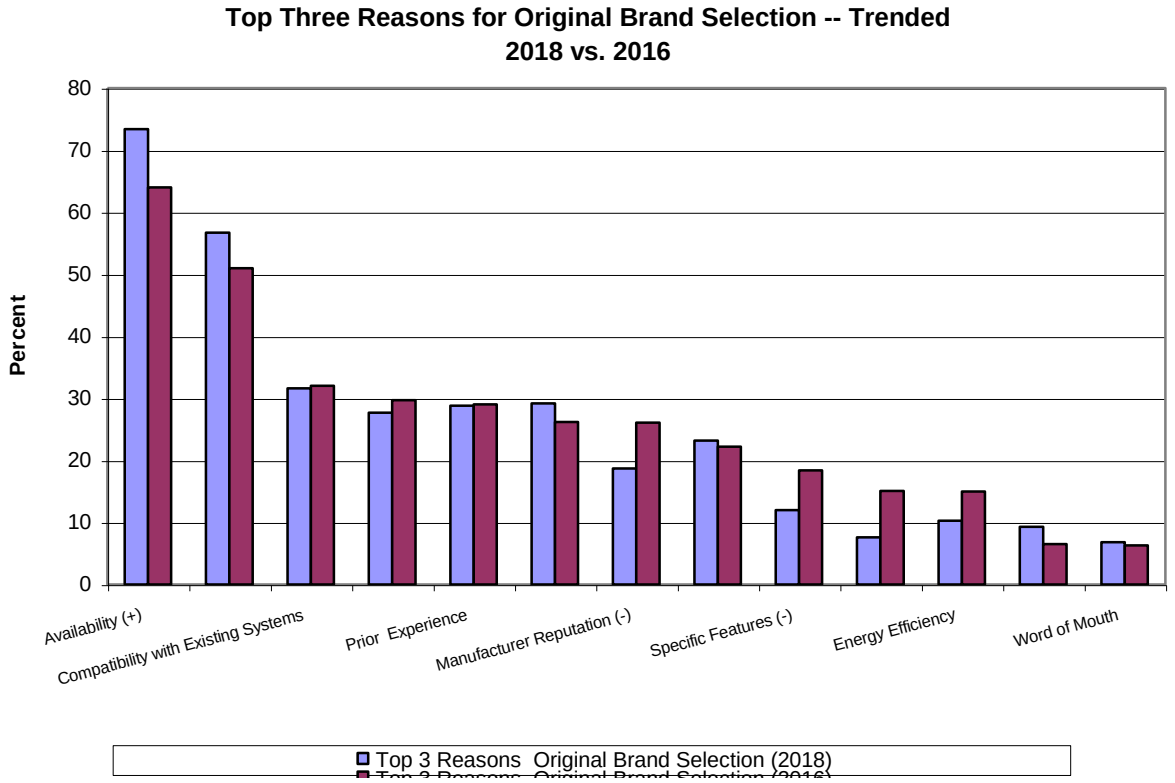


Table is Table 147 (for top 3 reasons)

Top 3 Reasons for Original Brand Selection – Trended

In 2018, compared with 2016, Availability continues to be top-3 reason for original brand selection as does Price. Note that as a first and top-3 choice, Availability completely overshadows all of the other attributes. This was also the case in 2016. Further, the relative importance of Availability rose while Price remains statistically unchanged between 2016 and 2018.

- Manufacturer Reputation, Specific Features and Manufacturer Support and Training all dropped significantly between 2016 and 2018. In contrast, with the exception of Availability, no other reason was cited by significantly more electrical contractors in 2018 compared with two years earlier.



Total Sample for V6 in 2018 = 203; Total Sample for V6 in 2016 = 359
(-) Indicates a significant decline vs. 2016 (+) Indicates a significant increase vs. 2016

Brand Substitution: The top-3 reasons for brand substitution mirror that of original brand selection. Among the total sample, Availability and Price trump all other attributes as a top -3 reason for brand substitution. Note that as a first and top -3 choice, Availability completely overshadows all of the other attributes. This was also the case in 2016.

Compatibility with Existing Systems, which was first asked in 2014, had resonance with 35% of electrical contractors. Ease of Installation was mentioned by 30%. Made in America, Durability and Prior Experience were each chosen by between 20% - 25% of electrical contractors on a top-3 reason basis and together with Ease of Installation, form a third tier of top reasons for brand substitution.

Manufacturer Reputation and Specific Features were each chosen by about 15%. Energy Efficiency, Real-Time Technical Support, Word of Mouth and Manufacturer Support and Training were each chosen by about 10% or less.

Once again, it is somewhat surprising that Energy Efficiency does not play a larger role as a top-3 reason for brand substitution.

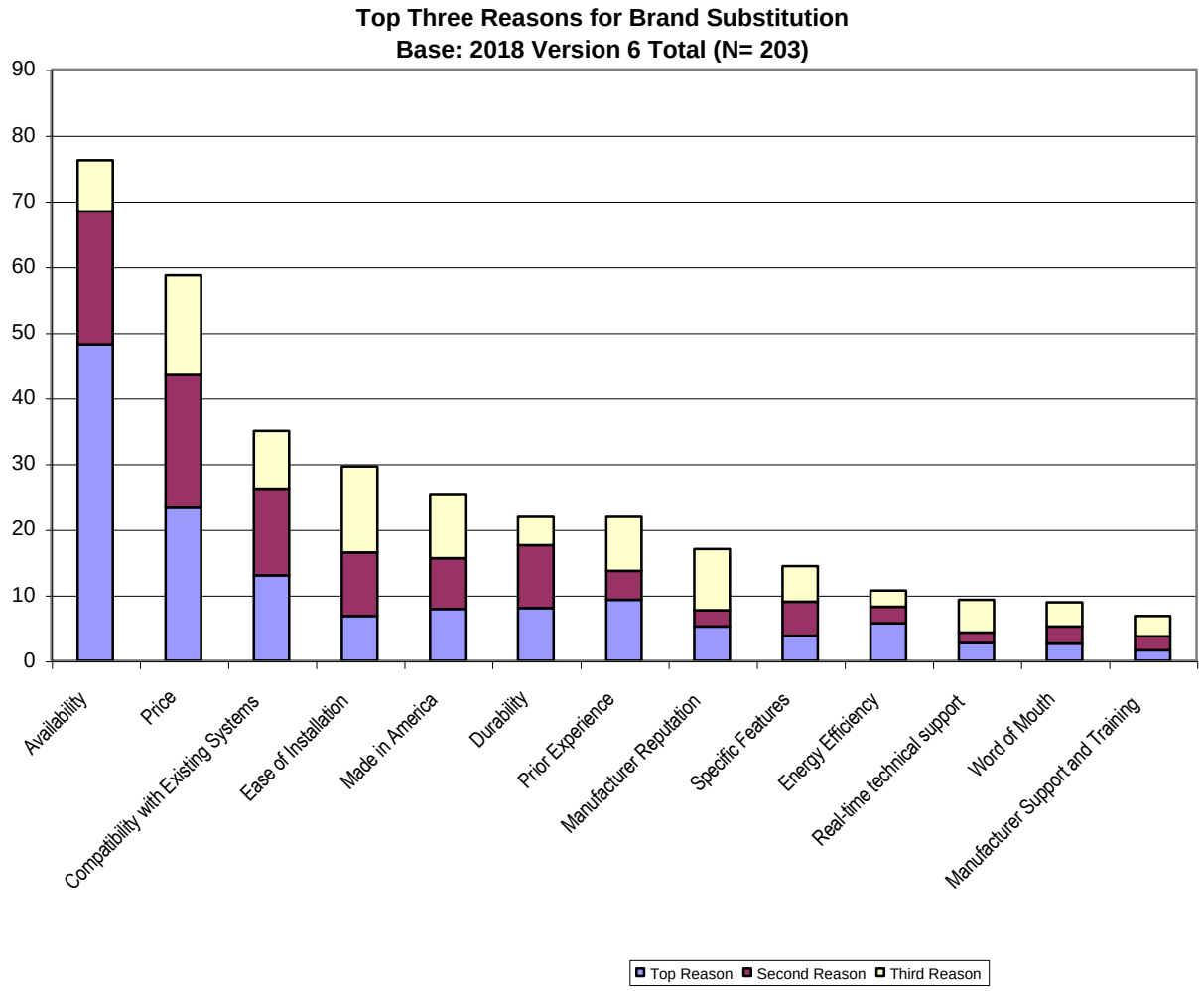


Table is Table 141 (for top 3 reasons)

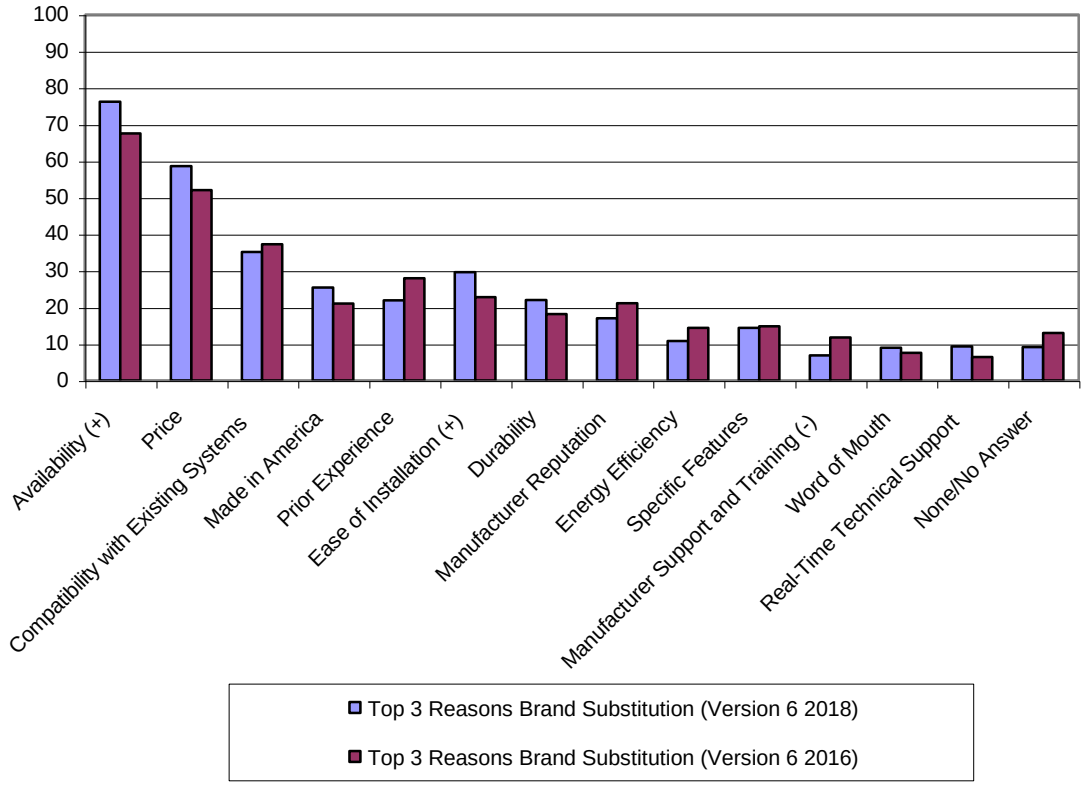
Top 3 Reasons for Brand Substitution – Trended

In 2018, compared with 2016, Availability continues to be top-3 reason for original brand selection, as does Price. However, the relative importance of Availability increased significantly from 68% to 76%, while Price increased directionally to 59% from 52% in 2016. With the exception of 2012, when it was 44%, Price historically has been in the 63% to 66% range. It will be interesting to see if Price remains below its historical level in subsequent Profile Studies.

Only two other attributes experienced significant changes: Ease of Installation posted a significant increase vs. 2016 while and Manufacturer Support and Training posted a significant decline compared with two years earlier.

- The apparent decline in Energy Efficiency as a top reason for brand substitution is not statistically significant vs. 2016 but does draw attention to the low number of mentions it receives. One on-going hypothesis is that it is "assumed" to already "be in there" and/or that there is a perception that brands do not differ on this attribute.

Top 3 Reasons for Brand Substitution --Trended
Version 6 (2018 Vs. 2016)



(-) lndicates a significant decline vs. 2016
(+) Indicates a significant increase vs. 2016

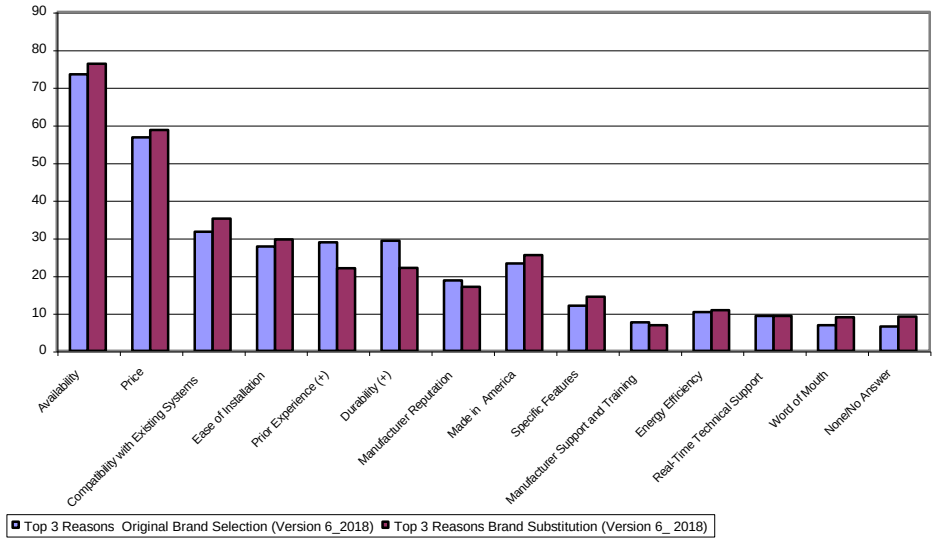
Table is Table 141 (for top 3 reasons)

Comparison of Main Reasons for Original Brand Selection Vs. Substitution

Regardless of whether the context is original brand selection or brand substitution, Availability and Price emerge as substantially more important than any of the other attributes as the reason for originally selecting a brand and for brand substitution. Compatibility with Existing Systems, which was first introduced in 2014, is now higher than or comparable to Ease of Installation, Prior Experience, Durability, Manufacturer Reputation and Made in America.

- There are only two statistically significant differences shown below. Prior Experience and Durability each assume higher importance in the original specification may play greater role in the case of original brand selection than in the case of brand substitution.

Top 3 Reasons for Originally Selecting a Brand Versus Making a Substitution
2018 Profile Study
(Base: Version 6 Total N = 203)



(+) Indicates that reason is significantly higher than corresponding bar at the 90% level of confidence
Tables are 147 for Original Selection (top 3 reasons) and Tables 141 for Substitution (top 3 reasons)

)

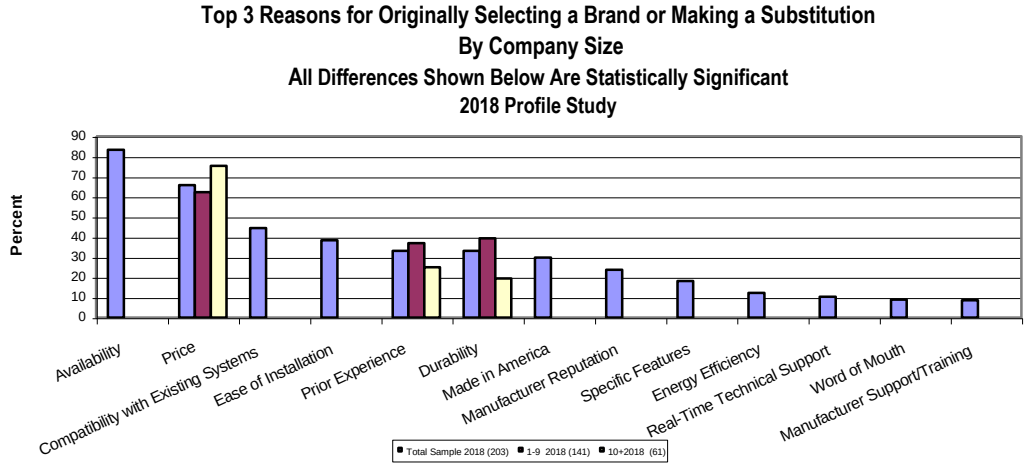
Brand Choice: Main Reasons for Original Brand Selection /Substitution

Of the 13 reasons for original brand selection/brand substitution (on a combined basis), those in small companies are more likely than their larger counterparts to mention only two attributes: Prior Experience and Durability.

It is interesting that two years ago, the difference by company size involved fully seven attributes: Ease of Installation, Durability, Made in America, Energy Efficiency, Word of Mouth and Availability of Real Time Mobile Information. It will be interesting to see if the number of differences by company size stays low or grows in two years. **[2016 results not shown]**

As was the case two and four years ago, Price is the only area that is more important to larger firms (10+ employees) than to their smaller counterparts (1-9 employees).

- In 2018, Made in America emerged as significantly less important to firms with 5-9 employees compared with firms with 1-4 employees (17% vs. 33%, respectively, not shown). This is undoubtedly related to the types of work that they perform.



Only significant differences by company size are shown

Brand Choice: Main Reasons for Original Brand Selection /Substitution – By Age

- Respondents who are aged 65+ are more likely than those who are aged 35-54 to cite Prior Experience, and more likely than those aged 35-54 to cite Made in America. Those aged 65+ are more likely than the total sample to cite Energy Efficiency and Word of Mouth.

- Respondents aged 55-64 are more likely to cite Durability compared to the totals sample but less likely than the total sample to cite Ease of Installation or Prior Experience.

- Those aged 35-54 are less likely than the total sample to cite Specific Features.

Main Reasons for Original Brand Selection/Substitution
-- By Respondent Age
2018 Profile Study (Only Statistically Significant Differences Are Shown)

	Total Sample (203)	35-54 (41)	55-64 (82)	65+ (66)
	%	%	%	%
Availability	83			
Price	66			
Compatibility with Existing Systems	44			
Ease of Installation	38		*29*	
Durability	33		**40**	
Prior Experience	33		*27*	**43**
Made in America	30	*20*		**41**
Manufacturer Reputation	24			
Specific Features	18	*10*		
Energy Efficiency	12			**20**
Real-Time Technical Support	10			
Word of Mouth	9			**14**
Manufacturer Support/Training	9			

On this table, results by subgroup are compared to the total. Where a subgroup is greater than the total, the percentage is **bolded**; where it is smaller it is in *italic*s. Empty cells indicate that there is no difference between that subgroup and the total.

▲*TRAINING and TOPICS OF INTEREST*

Will Take/Have Taken Training and What Was Studied

More than seven in ten electrical contractors say that they, or someone in their firm, has taken training in the past 12 months or plans to take training in the next 12 months to improve or broaden skills or for certification. This training could be in the form of on-line, correspondence or classroom training. There is no statistically significant difference between the percentages that took training (74%) vs. those who plan to take training (77%). Further, there is no change in the percent taking training or planning to take training versus two years ago.

However, there has been a consistent decline in the percentage mentioning many of the individual courses. Further, there is a related finding that electrical contractors are participating in significantly fewer of these training and certification classes, perhaps because they are busier with paid work. If that is indeed the reason, it is a positive finding!

For example, while NEC changes are mentioned most often, the percentage mentioning it dropped dramatically from 71% to 54%. Other interesting subjects for training included:

- Lighting (46%, down from 58% two years ago), particularly lamp technology and lighting controls and systems (currently about 33% each)
- Grounding and Bonding (32% down from 49%)
    - Automation and controls (32% down from 43%). Interest in this has, however, decreased since 2014 (when it was 52%); however, in the most recent wave, only Home Automation Systems training posted a significant drop from 23% to 9%
- Safety (37%, statistically unchanged)
- Green/Sustainable (23% down from 40% two years ago)
- Electrical Testing and Maintenance (from 34% t0 27%)
- Cabling (from 33% to 23%)

None of the training topics included in this survey has posted a significant increase compared with two year ago. Further, topics such as Drones and the Internet of Things has not yet attracted large attendance.

Courses Taken or Will Take

	2018 (233)	2016 (350)	2014 (560)
	%	%	%
Have Taken Training in Past 12 Months	74	70	76
Will Take Training in Next 12 Months	77	78	74
Courses Taken or Will Take			
Base	189	282	414
	%	%	%
MENTIONED ANY	97	98	97
NEC Changes	54<	71	67
LIGHTING (Net)	46<	58	58
Lamp Technology, incl. LED	33	39	33
Controls/Systems	32<	44	50
Drivers/Ballasts	23<	30	35
Lighting Design	18<	26	31
Safety (Electrical/Personal/On-site/Jobsite	37	42	47
Grounding/Bonding	32<	49	50
AUTOMATION/CONTROLS (Net)	32<	43	**<52**
Fire/Life Safety Systems	20	23	**<30**
Building Automation Systems	15	17	**<25**
Security Systems	12	13	**<20**
Home Automation Systems	9<	23	20
Electrical Testing and Maintenance	27<	34	N/A
GREEN/SUSTAINABLE (Net)	23<	40	39
Alternative Energy Systems	11<	22	24
Electric Vehicle Charging Stations	10	14	13
Green/Sustainable Building/Energy Audits	7	8	10
LEED Certification	6<	12	12
Energy Use Regulations	6<	11	12
Community Solar	6	10	N/A
Energy Storage	6	9	8

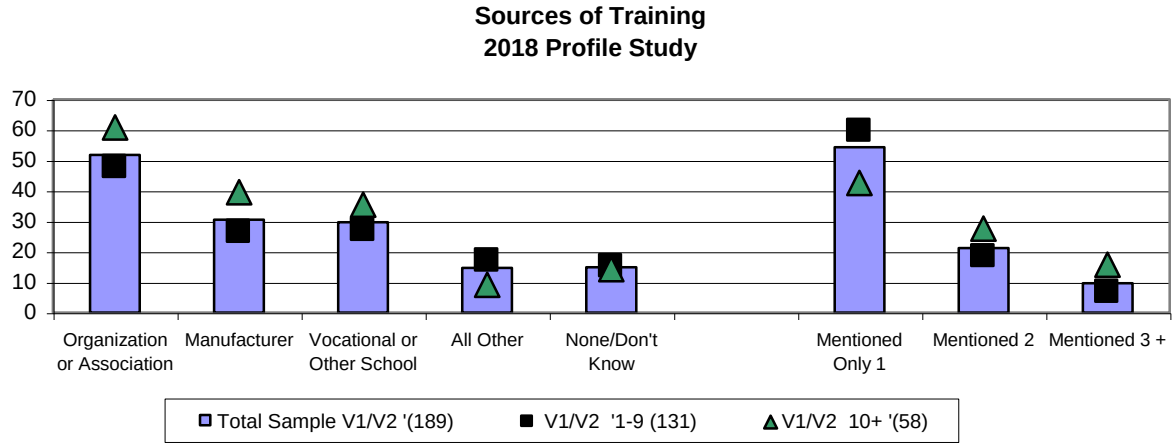
Courses Taken or Will Take, Continued

		2018	2016	2014
Base		189	282	414
		%	%	%
CABLING (Net)		23<	33	37
	Data and Telecom: Cable, Conduit, etc.	15	19	23
	Power	14<	24	24
	Data and Telecom: Testing	13	16	18
Power Quality		14	19	21
Estimating/Financial Management		13<	19	21
Design/Build		10<	**25>**	19
HVAC		10	N/A	N/A
Electrical System Design or BIM		9<	22	18
Increasing Productivity		9<	17	20
How to Use New Software		9<	15	N/A
Systems Integration		9	11	**<21**
Developing New Business Opportunities		8<	21	17
Sound and Video/VDV (Residential)		7	11	12
Internet of Things		7	N/A	N/A
Sound and Video/VDV (Commercial)		5<	11	13
Line Work		4<	8	8
Pre-Fab/Off-site Building		3<	10	N/A
Renovation/MACS/Maintenance		3<	9	**<17**
Collaborative Building (Including IPD)		2<	5	N/A
Drones		2	N/A	N/A
How to Recruit a Workforce		0	N/A	N/A
Mentioned 1		24>	9	12
Mentioned 2		15	**11>**	7
Mentioned 3 or more		58<	78	78
Mentioned 6 or more		35<	50	49

Sources of Training

Organizations/Associations are among the most frequently mentioned sources of training.

- Not surprisingly, electrical contractors in small firms (1-9 employees) are more likely to only mention one training source compared with those in larger firms.



Sources of Certification

About 8 in 10 who have or who will take training named a source for the Certification (not shown). Organizations/Associations are among the most frequently mentioned sources of certification. Not surprisingly, electrical contractors in small firms (1-9 employees) are more likely to only mention one certification source compared with those in larger firms.

Version 1/Version 2 (Sources of Certification; Sample = 189)