

North American Distribution Automation Market Assessment & Outlook 2018-2020

Final Report



©June 2018

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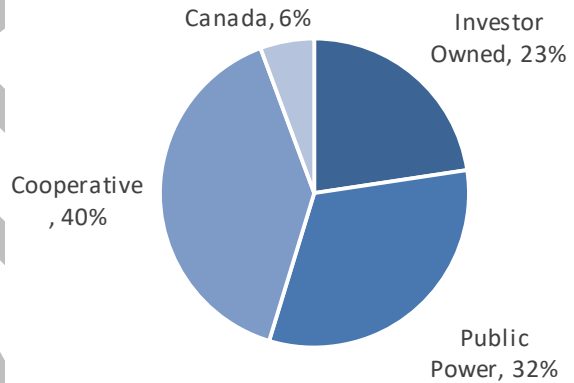
Introduction

The findings presented in this report are based on the completion of surveys received from 12 investor-owned utilities, 17 public power utilities, 21 electric cooperatives, and 3 electric utilities in Canada. This utility sample represents electric power service to more than 16 million customers in the US and Canada, amounting to about a 10% sample based on North American customer totals.

About one-half of the utilities in the survey sample consist of companies providing electricity to at least 100,000 users. A listing of all participating utilities is included at the end of this report. Several of the largest public power and electrical cooperatives participated in this year’s survey.

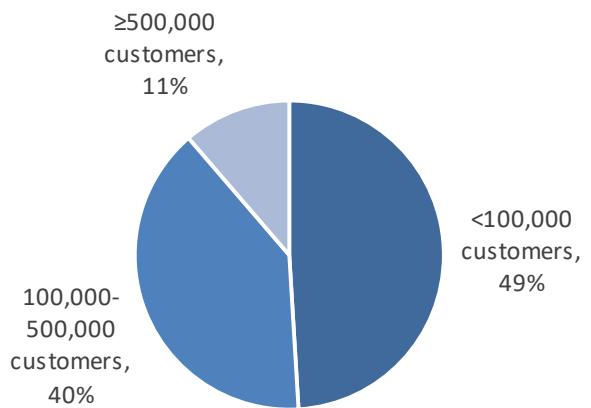
Type

Investor Owned	12	23%
Public Power	17	32%
Cooperative	21	40%
Canada	3	6%



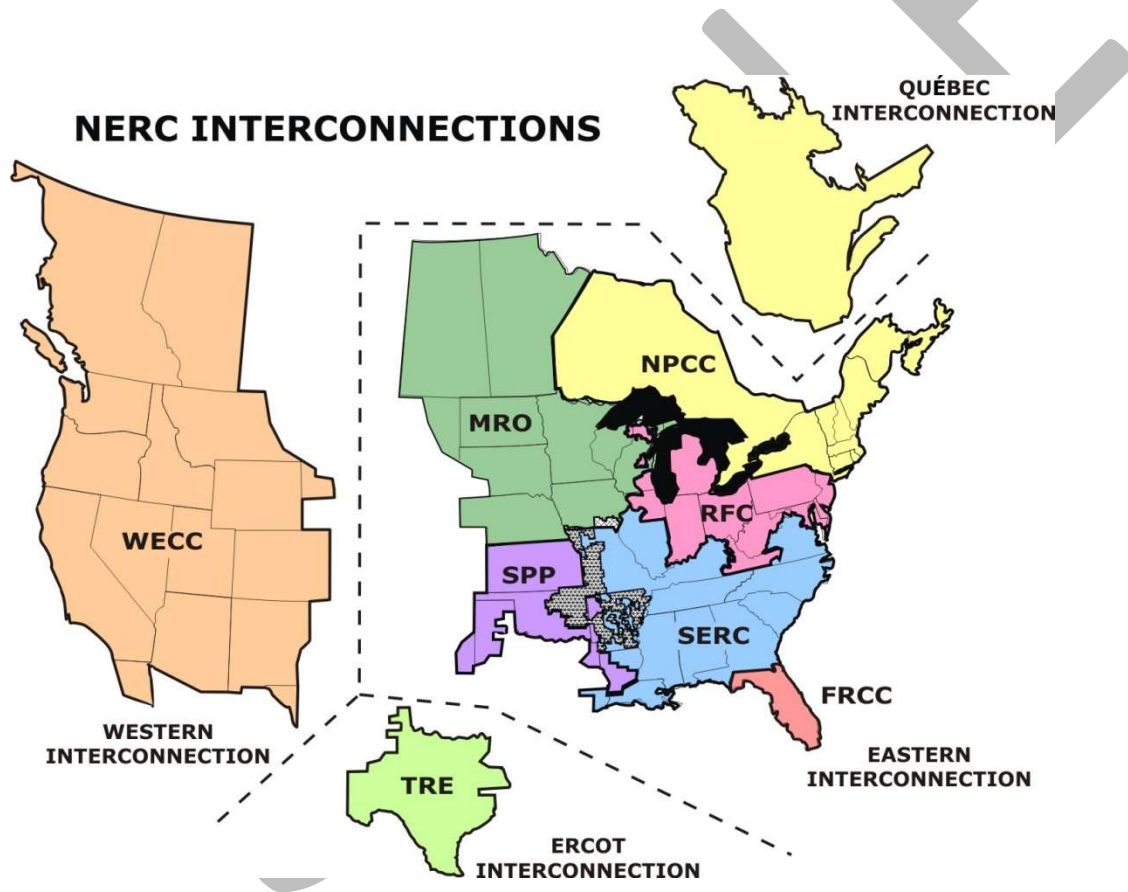
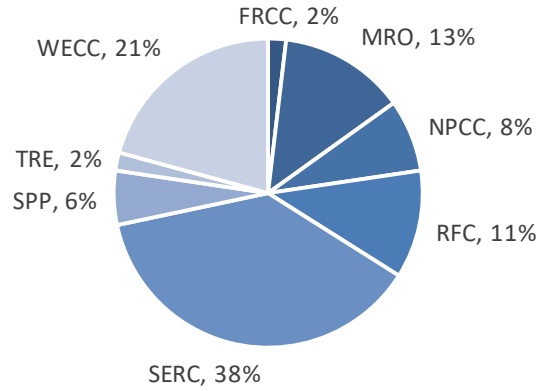
Number of Customers

<100k	26	49%
100k-499k	21	40%
>=500k	6	11%



NERC Interconnection region

NPCC	9	12%
RFC	10	13%
SERC	22	29%
FRCC	3	4%
MRO	6	8%
SPP	5	7%
TRE	4	5%
WECC	16	21%



Outlook Section for North American Distribution Automation: Trends in DA Investment for 2018-2024

The basis for the Newton-Evans outlook presented in this section of the report has its roots in multiple utility survey-based studies dating from 2005. More than 300 large and mid-size U.S. and Canadian utilities have participated in at least one DA survey-based study over the 2005-2018 era.

The 2018 survey data found that among our participant sample (representing nearly 10% of total electricity customers served (165 million end-use customers in North America), nearly \$ [SAMPLE] was budgeted for DA-specific external spending for the three-year period 2018-2020. At about \$[SAMPLE] per year, using a 10x multiplier to estimate a range of North American total DA investment, the resulting dollar value is about \$[SAMPLE] in annual investment. This amount is in line our mid-range estimate.

U.S. Electric Utility Investments in Distribution Automation:
Sum of All DA Categories
(line graph, 2008-2024)

Following are three representations of the outlook for DA investments in total, under the low, mid-range and high outlook scenarios. These estimates include low, mid-range and high economic outlooks for DA investments planned by North American utilities for the years 2018, 2019 and 2020.

SAMPLE

[SAMPLE]

U.S. Electric Utility Investments in Distribution Automation:
Sum of All DA Categories
LOW ESTIMATE (line graph, 2008-2024)

SAMPLE

[SAMPLE]

U.S. Electric Utility Investments in Distribution Automation:
Sum of All DA Categories
MID-RANGE ESTIMATE (line graph, 2008-2024)

SAMPLE

[SAMPLE]

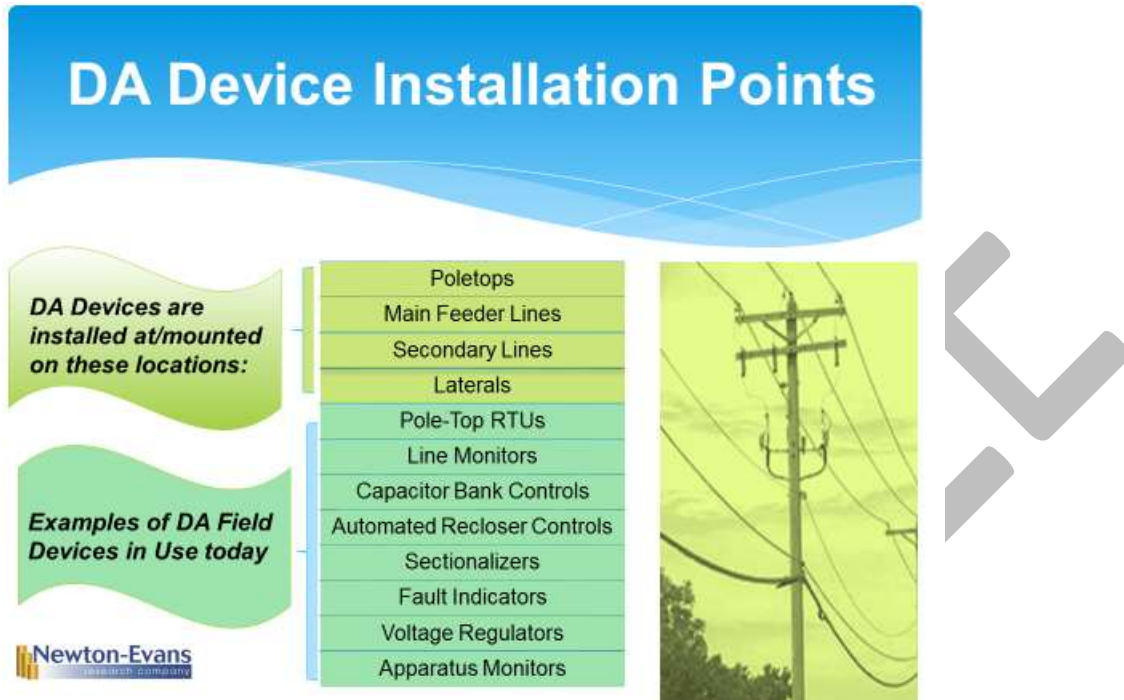
U.S. Electric Utility Investments in Distribution Automation:

Sum of All DA Categories

HIGH ESTIMATE (line graph, 2008-2024)

The following sub-sections of the outlook section of the DA report takes a closer look at the spending outlook for each of five major components of DA investments under the low growth, mid-range and high growth outlooks. Some of the financial market segment estimates are based on findings reported in the Newton-Evans Research Company's *2018 Market Overview Series of Distribution Automation topics*.

Smart Field-based Distribution Equipment: The list of applicable equipment that is included in our mix of smart field-based equipment – and some of the DA controllers - is shown in the following illustration:



[SAMPLE]

U.S. Electric Utility Investments in Distribution Automation:
Smart Field-Based Distribution Equipment (line graph, 2008-2024)

[SAMPLE]

U.S. Electric Utility Investments in Distribution Automation:
DA Controllers (line graph, 2008-2024)

SAMPLE

[SAMPLE]

U.S. Electric Utility Investments in Distribution Automation:
CC-based DA Software and Platforms (line graph, 2008-2024)

U.S. Electric Utility Investments in Distribution Automation:
SS--based DA Software and Platforms (line graph, 2008-2024)

SAMPLE

[SAMPLE]

U.S. Electric Utility Investments in Distribution Automation:
Telecoms for DA (line graph, 2008-2024)

SAMPLE

Survey Findings

This section of the report presents question-by-question findings from a survey of 53 electric utilities in North America and Canada.

The survey sample's responses to each question are addressed by a few written observations, a pie chart or bar chart, and a table comparing responses by type and size of utility. In some cases, comparisons between the 2014 study and similar questions in the 2018 study are shown in the bar chart graphic.

SAMPLE

1. Please indicate the approximate number of distribution feeders (4kv-38kv) on your system. This year's survey sample indicated a total of 52,562 distribution feeders. The majority of these feeders (85%) are assets owned and operated by large investor owned utilities. Based on our estimate of 225,000 MV distribution feeders currently in operation across North America, at an average of 4 feeders per MV substation, that would provide a 23% sample for the study. Please see the introduction for more detailed information on North American substations, distribution line miles, and feeder estimate derivation.

% of distribution feeders in North America accounted for by the survey sample (out of an estimated 225,000 distribution feeders operating in North America)

distribution feeders in survey sample
52,562
23%

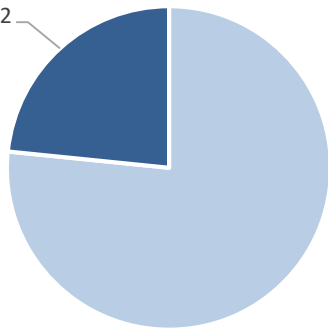


Fig. 1

Table 1. Total number of distribution feeders reported by utilities answering the survey

	Totals	Percent
Summary	52,562	100%
Investor Owned	44,680	85%
Public Power	3,945	7.5%
Cooperative	3,793	7.2%
Canada	144	0.3%
<100,000	2,554	5%
100k-499k	6,998	13%
≥500,000	43,010	82%

2014 Survey Findings

In 2014, the 75 survey respondents accounted for many thousands of primary feeders. Newton-Evans Research estimated the total number of primary distribution feeders in the US and Canada to be 175,000-180,000. Of this total, the 2014 survey sample represented 34,122 feeders, providing a 19% sample. The majority of utilities (and the majority of feeders) operate MV feeders at 13/15kV.

2. Approximately what percentage of all your feeders have SCADA controlled sectionalizing switches installed with operation that is A) manual B) semi-automatic or C) fully automatic?
[SAMPLE]

Average Percent of feeders with SCADA controlled sectionalizing switches that are manual only, semi-automatic, fully automatic

Fig. 2

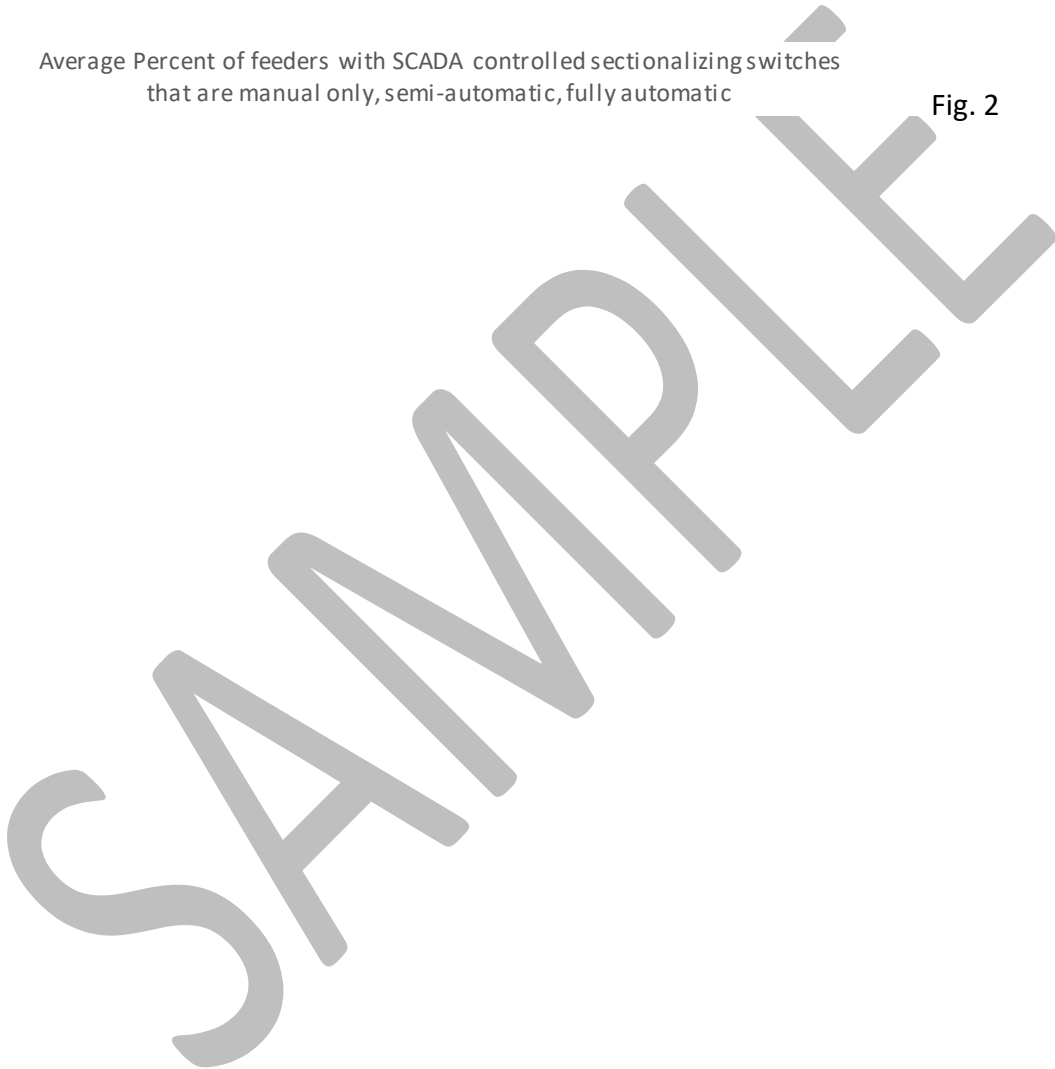


Table 2. Average Percent of feeders with SCADA controlled sectionalizing switches that are manual only, semi-automatic (upstream restoration is automatic and downstream restoration is manual), fully automatic (upstream and downstream restoration are both automatic)

	A) manual operation only	B) semi-automatic operation (upstream restoration is automatic and downstream restoration is manual)	C) fully automatic operation (upstream and downstream restoration are both automatic)
Summary			
Investor Owned			
Public Power			
Cooperative			
Canada			
<100,000 customers			
100,000-500,000			
≥500,000 customers			

2014 Survey Findings

This question was asked slightly differently in 2014: "Approximately what percentage (%) of all your feeders have both fully automatic and SCADA controlled sectionalizing switches/reclosers installed?"