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COMPANY NAME: IDAHO POWER COMPANY

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Report is required by:  OAR 860-023-0151

Statute

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Electric Service Reliability Report

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**CONNIE ASCHENBRENNER**  
Rate Design Senior Manager  
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April 28, 2022

**VIA ELECTRONIC FILING**

[puc.FilingCenter@puc.oregon.gov](mailto:puc.FilingCenter@puc.oregon.gov)

Re: RE90(10) - Idaho Power Company's Electric Service Reliability Annual Report for the Year 2021

Filing Center:

Pursuant to OAR 860-023-0151, Idaho Power Company transmits for electronic filing its Electric Service Reliability Annual Report for the Year 2021.

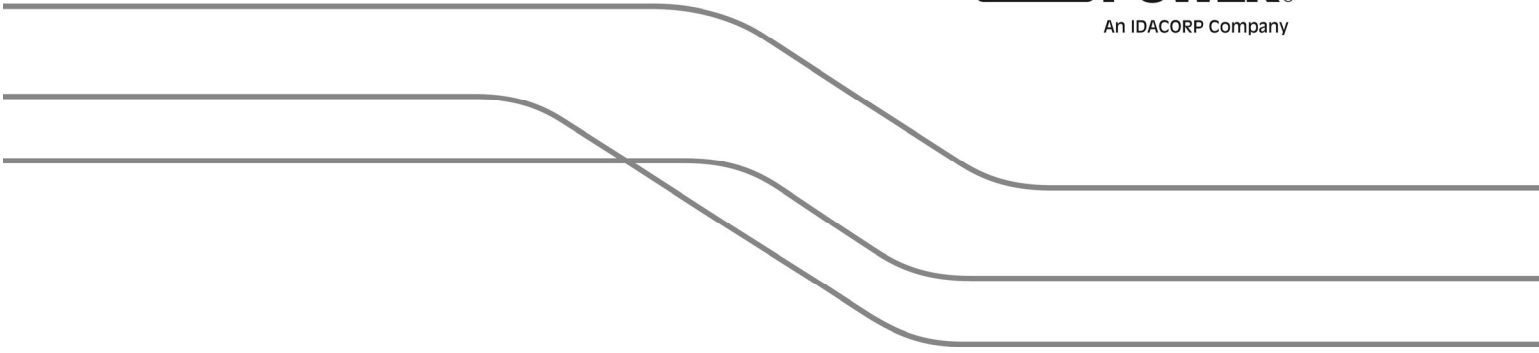
If you have any substantive questions, please call Jon Axtman at 208-388-5036.

Very truly yours,

A handwritten signature in blue ink that reads "Connie Aschenbrenner".

Connie Aschenbrenner

CA:sg  
Enclosure



**Idaho Power Company  
2021 Electric Service  
Reliability Annual Report**

**April 2022**  
2022 Idaho Power



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## EXECUTIVE SUMMARY

The information in this document presents Idaho Power's 2021 Electric Service Reliability Annual Report in accordance with OAR 860-023-0151. The report discusses the performance of Idaho Power's Oregon electric service through a narrative summary and includes several tables and figures.

At year-end 2021, Idaho Power served 19,538 customers from 64 distribution circuits served by 30 substations in the far central-eastern portion of Oregon. The composite performance of the circuits in 2021 included the following:

- 779 sustained (greater than five minutes) interruption events
- 28,965 customer interruptions
- 72,018 customer hours out
- System Average Interruption Frequency Index (SAIFI) of 1.48
- System Average Interruption Duration Index (SAIDI) of 3.69 hours
- Momentary Average Interruption Event Frequency Index (MAIFI<sub>E</sub>) of 1.80

Idaho Power used the calculation of a threshold for major event days (MEDs) as defined in the Institute of Electrical and Electronic Engineers (IEEE) Standard 1366 and monitored its Oregon service area for MED occurrences. All the indices at the circuit and system levels in this report are shown with and without MED events for years 2017-2021. Idaho Power's 2021 threshold in Oregon for a major event day ( $T_{MED}$ ) per the IEEE 1366 definition was a daily SAIDI of 10.19 minutes per customer. With the additional criterion of a daily customer average interruption duration index (CAIDI) of 5 hours (300 minutes) per OAR 860-023-0161, Idaho Power experienced 0 major event day in its Oregon service area in 2021. Idaho Power's calculated  $T_{MED}$  for 2022 in Oregon is 10.66 minutes per customer. The calculation of the  $T_{MED}$  and identification of major event days is done while considering all of Idaho Power's Oregon customers.

Compared to 2020, Idaho Power's Oregon service area SAIFI increased by 0.52 interruptions per customer from 0.97 in 2020 to 1.48 in 2021. Excluding major events, SAIFI increased by 0.54 from 0.94 in 2020 to 1.48 in 2021. The average duration of sustained outages also increased compared to last year; SAIDI increased by 0.60 hours per customer from 3.09 in 2020 to 3.69 in 2021. The increase also occurred when excluding major events, as 2021 saw an increase of 0.81 hours per customer over 2020 (2.87 to 3.69). Finally, MAIFI<sub>E</sub> decreased in 2021 compared to 2020 by 0.27 momentary interruption events per customer from 2.07 in 2020 to 1.80 in 2021.

The attached charts and tables show Idaho Power's Oregon system performance over the previous five years for SAIFI, SAIDI and MAIFI<sub>E</sub> at the system and circuit level in accordance with OAR 860-023-0151 (2)(a). In addition to the reliability indices, a summary of sustained interruption causes is shown at the system level in accordance with OAR 860-023-0151 (2)(b). A table translating Idaho Power's cause categories to the cause categories listed in OAR 860-023-151 (2)(b) can be found in the Appendix. The Appendix also includes supplemental information such as substation, voltage, operating area and customers connected for each distribution circuit in accordance with OAR 860-023-0151 (2)(h). A map is also provided which shows the distribution circuits in Idaho Power's service area with Oregon customers in accordance with OAR 860-023-0151 (2)(g).

Idaho Power continues to collect detailed outage information for all sustained outage events through its Outage Management System (OMS). Historical data from the OMS is stored and circuit performance is analyzed for the prioritization of capital projects to improve reliability. Idaho Power also continues to utilize data from its Smart Grid Monitoring system to calculate MAIFI<sub>E</sub> as it has in past years.

Idaho Power continues to implement programs and projects to improve customer service and electric service reliability. Company programs related to electric service reliability include the annual Oregon safety inspection/reliability patrols, the line clearing and vegetation management program, the pole inspection and treatment program, and annual maintenance and capital projects that replace aging assets and improve reliability.

Idaho Power completed its Oregon AMI Expansion Project in 2021 where the Company replaced 1487 meters as outlined in the table below. AMI meters provide numerous benefits to customers and the Company with one of the major benefits being improved reliability. As a result of the project, 98.9 percent of Idaho Power's Oregon customers are now using AMI meters.

Year	# of AMI Meters Installed
2020	575
2021	912
<b>Total</b>	<b>1487</b>

## DEFINITIONS

**CAIDI** – Customer Average Interruption Duration Index; the average duration that a customer experienced per sustained outage (greater than 5 minutes).

**CHO** – Customer Hours Out; CMI divided by 60.

**CI** – Customer Interruptions; the total number of customer interruptions from sustained outages (greater than 5 minutes).

**CMI** – Customer Minutes of Interruption; the total number of customer minutes of interruption from sustained outages (greater than 5 minutes). This is calculated as the product of customer interruptions and outage duration in minutes.

**IEEE** – The Institute of Electrical and Electronic Engineers.

**IEEE 1366** – The Institute of Electrical and Electronic Engineers (IEEE) Standard 1366 entitled *IEEE Guide for Electric Power Distribution Reliability Indices* (the 2012 edition), approved on May 14, 2012 by IEEE-SA Standards Board.

**MAIFI<sub>E</sub>** – Momentary Average Interruption Event Frequency Index; the average number of momentary interruption events per customer (less than or equal to 5 minutes).

**Major Event** – An event that exceeds the reasonable design and/or operational limits of the electric power system. A major event includes at least one major event day (MED).

**MED** – Major Event Day; a day when the daily SAIDI exceeds a predefined threshold value.

**MedEx** – Major Event Day Excluded; this suffix is used after a reliability index to indicate major event days are excluded. For example, SAIFI MedEx is SAIFI excluding major event days.

**OMS** – Outage Management System; refers to Idaho Power’s system for distribution system mobile workforce, switching and outage event tracking.

**Operating Area** – Idaho Power’s customers in Oregon are split into two operating areas: 1) the Jordan Valley region of the reporting area served by the Canyon Operations Center in Caldwell, ID and 2) the rest of the reporting area served by the Western Operations Center in Payette, ID. Approximately 97% of Idaho Power’s customers in Oregon are within the Western operating area, while the remaining 3% of Idaho Power’s customers in Oregon are within the Canyon operating area.

**Reporting Area** – Idaho Power’s entire service area in Oregon.

**SAIDI** – System Average Interruption Duration Index; the average duration from all sustained outages that a customer experienced per year (greater than 5 minutes).

**SAIFI** – System Average Interruption Frequency Index; the average frequency of sustained outages that a customer experienced per year (greater than 5 minutes).

**SGM** – Smart Grid Monitor; refers to Idaho Power’s system for monitoring momentary interruption events on its distribution network.

**T<sub>MED</sub>** – A major event day threshold value.



# SYSTEM SAIDI, SAIFI AND MAIFI<sub>E</sub>

## System SAIDI

Year	2017	2018	2019	2020	2021
SAIDI	3.66	2.47	2.01	3.09	3.69
SAIDI MedEx	3.34	2.47	1.70	2.87	3.69

Table 1 Five Years of System SAIDI

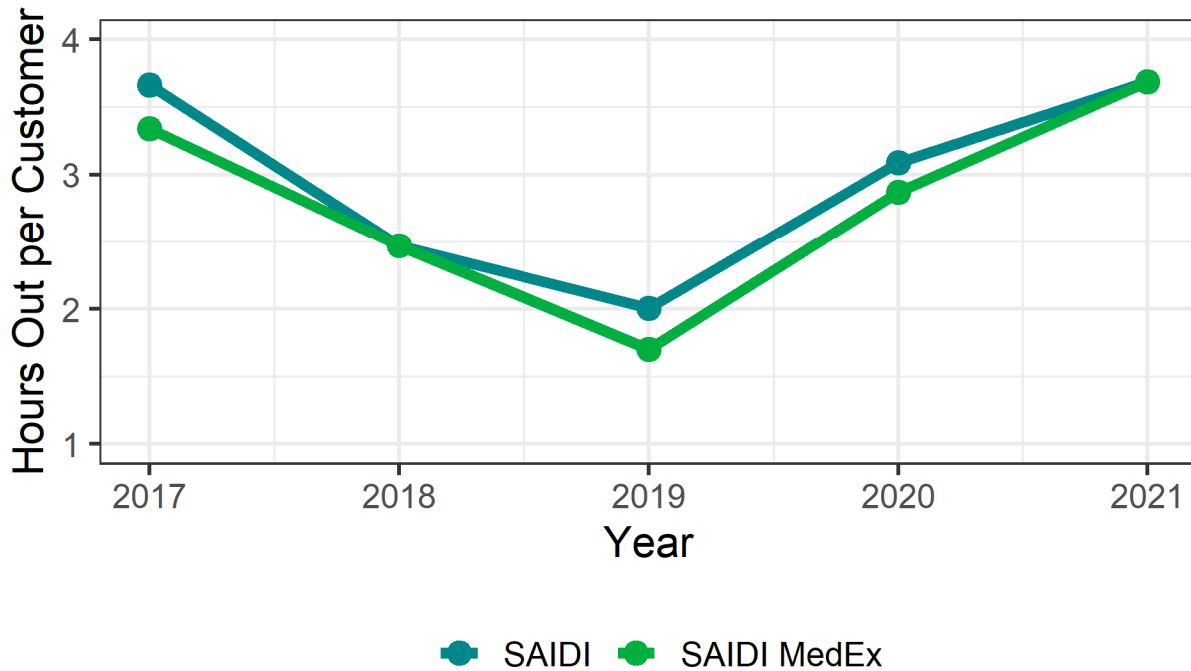


Figure 1 Five Years of System SAIDI

### System SAIFI

Year	2017	2018	2019	2020	2021
SAIFI	1.22	0.95	0.63	0.97	1.48
SAIFI MedEx	1.16	0.95	0.63	0.94	1.48

Table 2 Five Years of System SAIFI

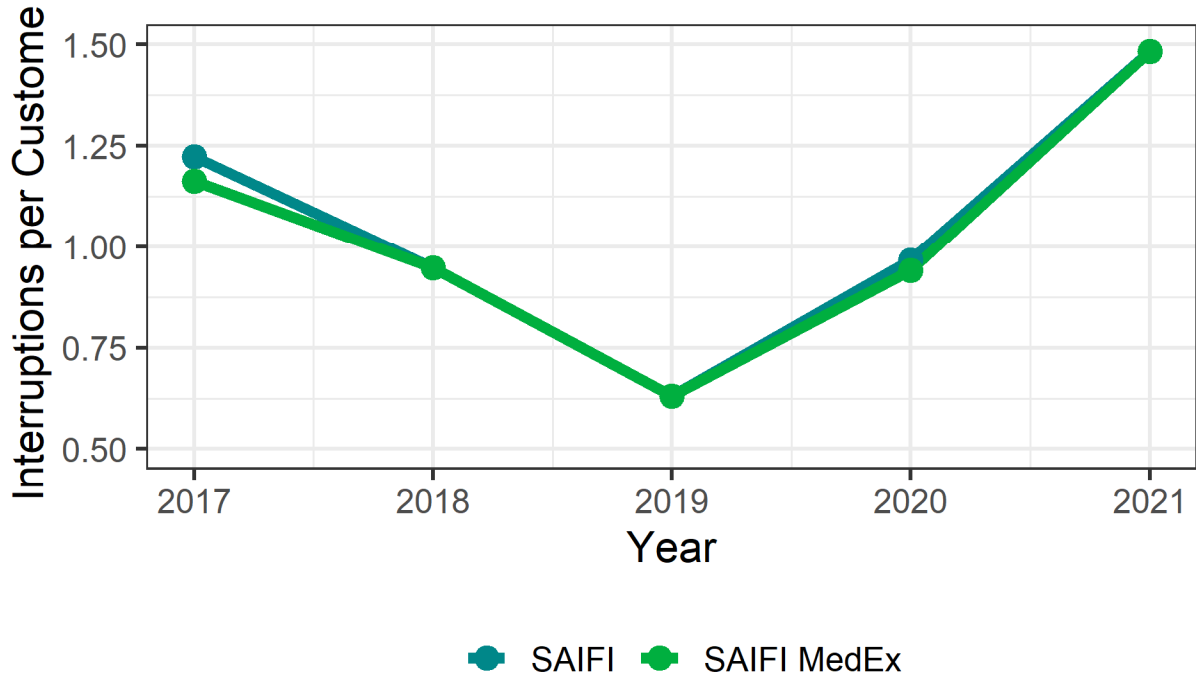


Figure 2 Five Years of System SAIFI

### System MAIFI<sub>E</sub>

Year	2017	2018	2019	2020	2021
MAIFI <sub>E</sub>	2.44	3.16	2.28	2.07	1.80
MAIFI <sub>E</sub> MedEx	2.44	3.16	2.28	2.07	1.80

Table 3 Five Years of System MAIFI<sub>E</sub>

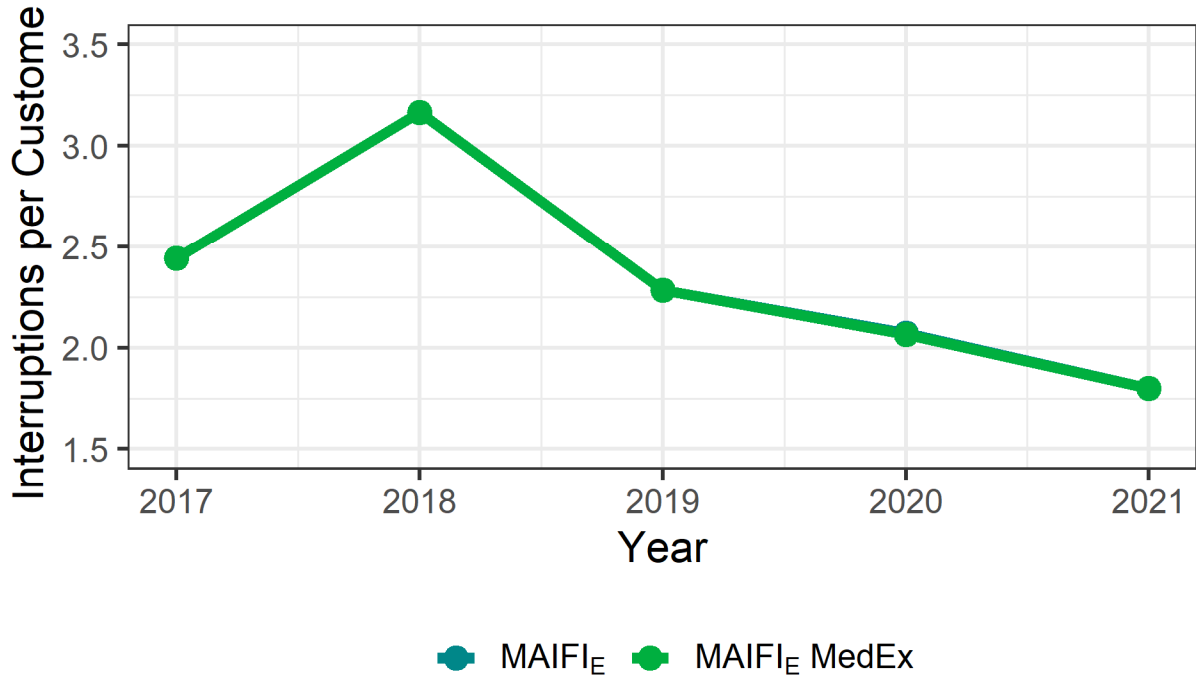


Figure 3 Five Years of System MAIFI<sub>E</sub>





## Sustained Interruption Event Causes

Cause	Number of Sustained Interruption Events					Percent of Total Sustained Interruption Events				
	2017	2018	2019	2020	2021	2017	2018	2019	2020	2021
Distribution – Equipment	277	159	172	150	197	27.5%	24.4%	25.2%	21.5%	25.3%
Distribution – Lightning	17	10	23	8	16	1.7%	1.5%	3.4%	1.1%	2.1%
Distribution – Other	63	46	46	41	27	6.3%	7.1%	6.7%	5.9%	3.5%
Distribution – Planned	114	91	119	133	125	11.3%	14.0%	17.4%	19.0%	16.0%
Distribution – Public	77	59	54	54	69	7.6%	9.1%	7.9%	7.7%	8.9%
Distribution – Unknown	97	72	62	99	108	9.6%	11.1%	9.1%	14.2%	13.9%
Distribution – Vegetation	118	79	91	120	128	11.7%	12.1%	13.3%	17.2%	16.4%
Distribution – Weather (Non-Lightning)	70	16	25	17	7	7.0%	2.5%	3.7%	2.4%	0.9%
Distribution – Wildlife	127	93	82	55	73	12.6%	14.3%	12.0%	7.9%	9.4%
Loss of Supply – Substation	11	7	3	2	5	1.1%	1.1%	0.4%	0.3%	0.6%
Loss of Supply – Transmission	36	19	6	20	24	3.6%	2.9%	0.9%	2.9%	3.1%
<b>Total</b>	<b>1,007</b>	<b>651</b>	<b>683</b>	<b>699</b>	<b>779</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

*Table 4 Five Years of Sustained Interruption Event Causes*

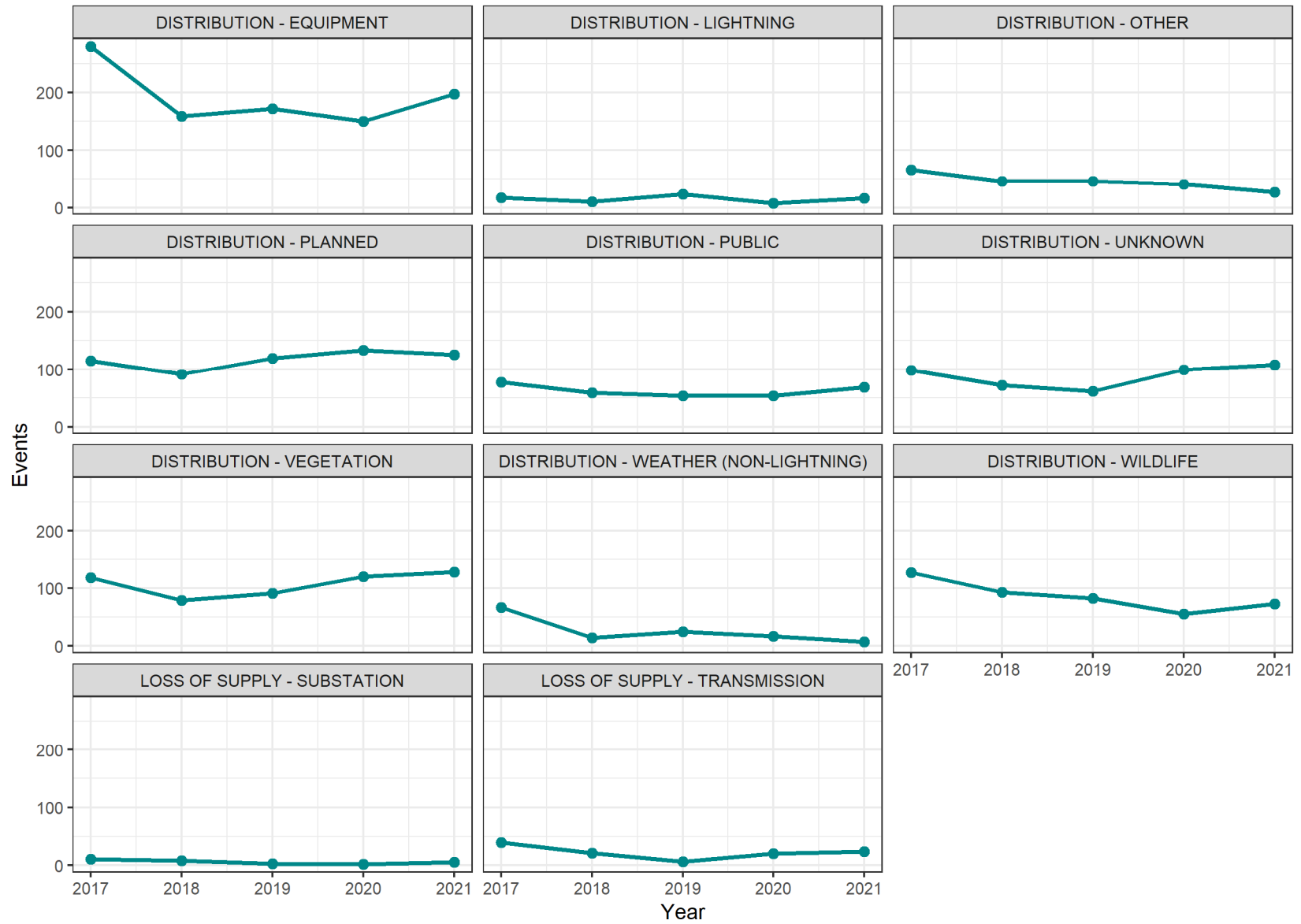


Figure 4 Five Years of Sustained Interruption Events by Cause

<b>Cause</b>	<b>Events</b>	<b>Hours Out</b>	<b>Event Ranking</b>	<b>Hours Out Ranking</b>
Distribution – Equipment	197	678	1	2
Distribution – Lightning	16	79	9	8
Distribution – Other	27	71	7	9
Distribution – Planned	125	3,029	3	1
Distribution – Public	69	246	6	5
Distribution – Unknown	108	445	4	4
Distribution – Vegetation	128	506	2	3
Distribution – Weather (non-Lightning)	7	21	10	10
Distribution – Wildlife	73	172	5	6
Loss of Supply – Substation	5	20	11	11
Loss of Supply – Transmission	24	85	8	7
<b>Total</b>	<b>779</b>	<b>5,361</b>		

*Table 5 2021 Sustained Interruption Event Cause Ranking*

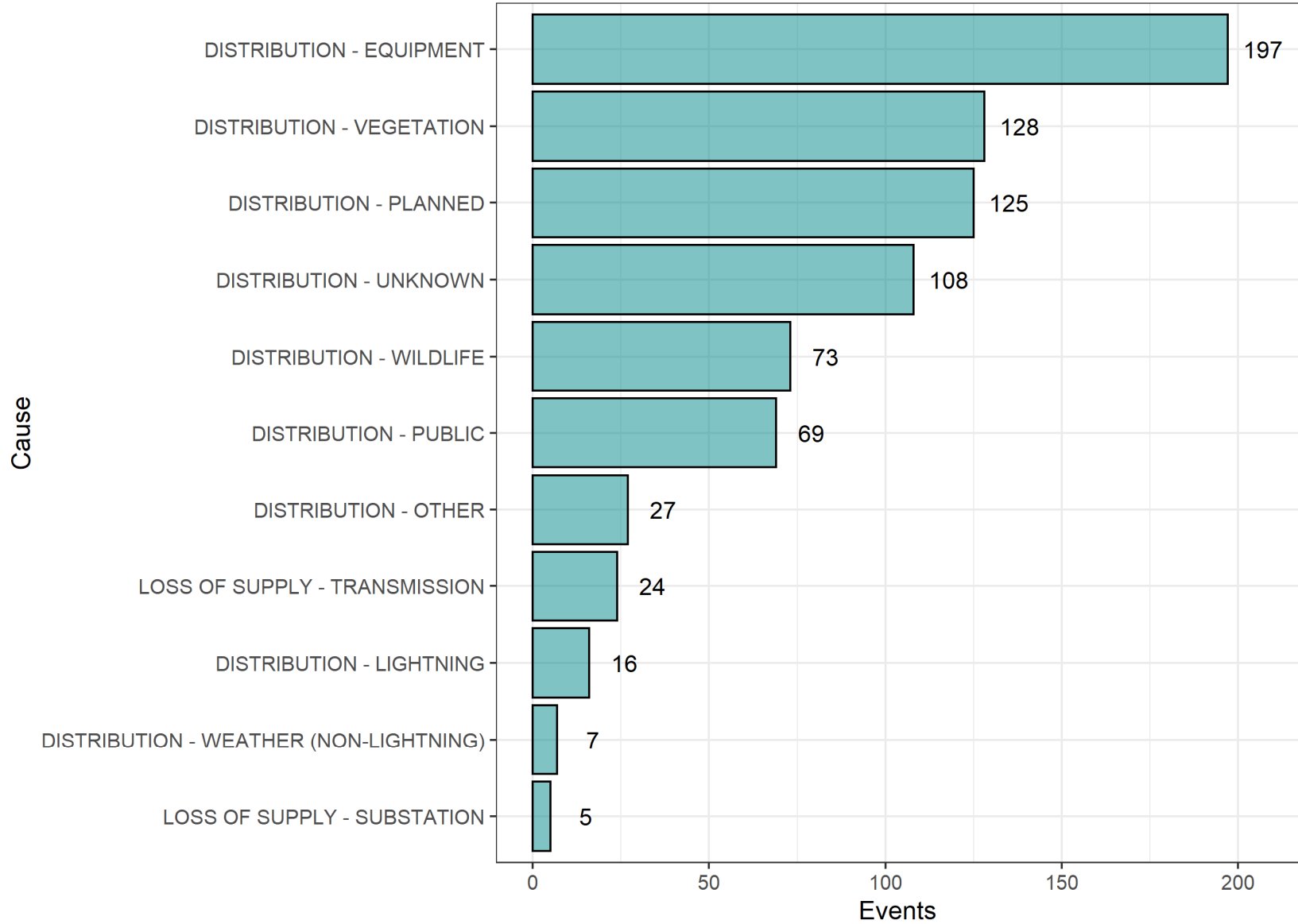


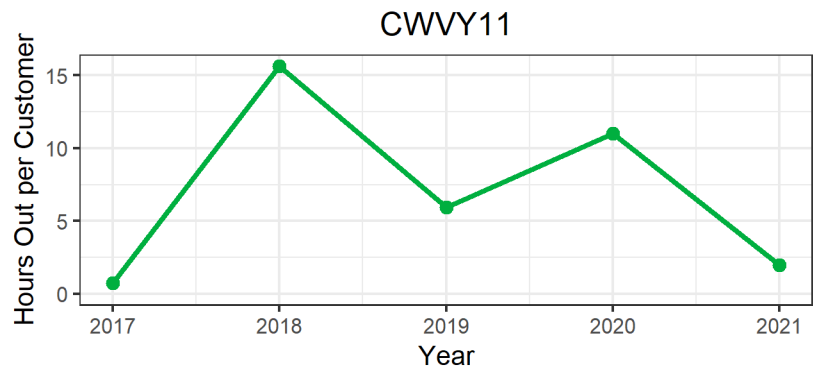
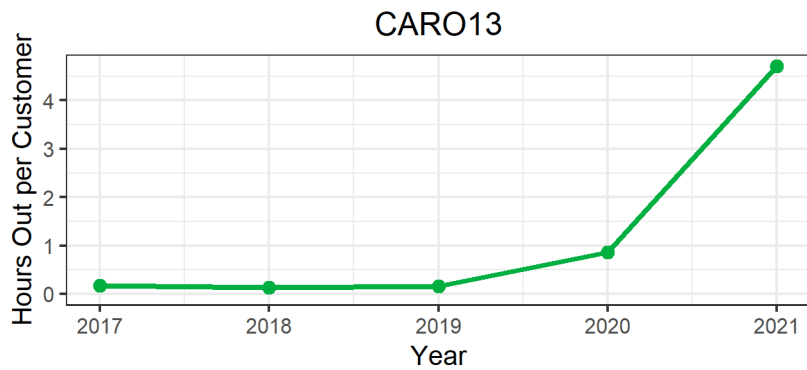
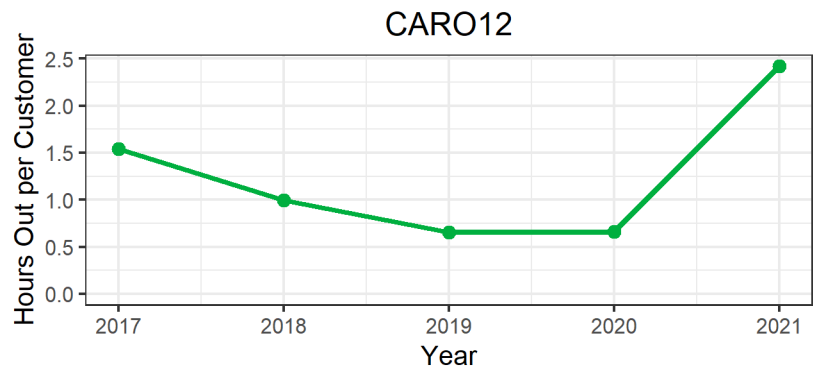
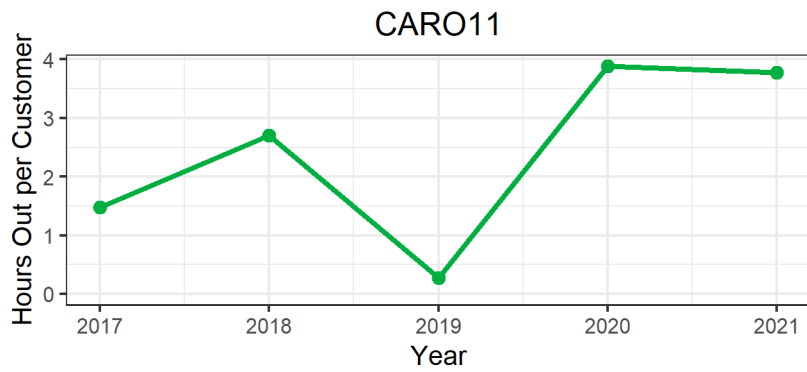
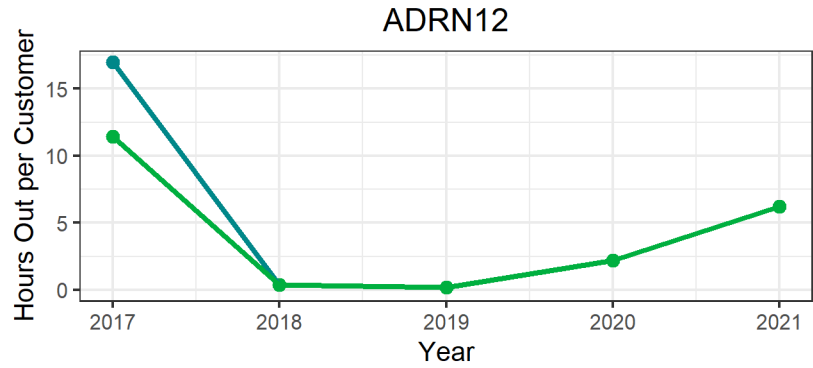
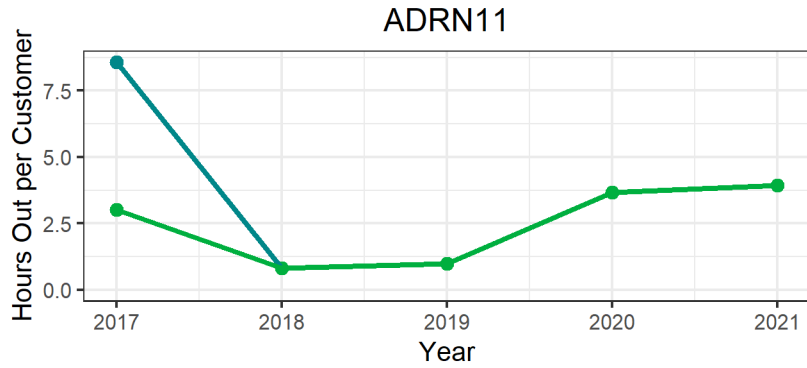
Figure 5 2021 Ranking of Sustained Interruption Event Causes

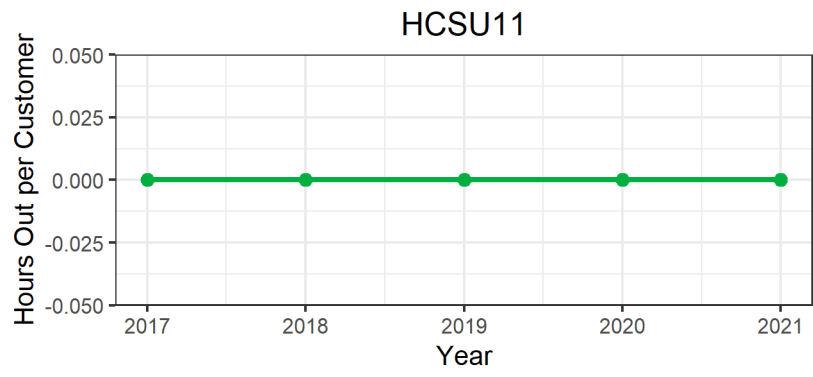
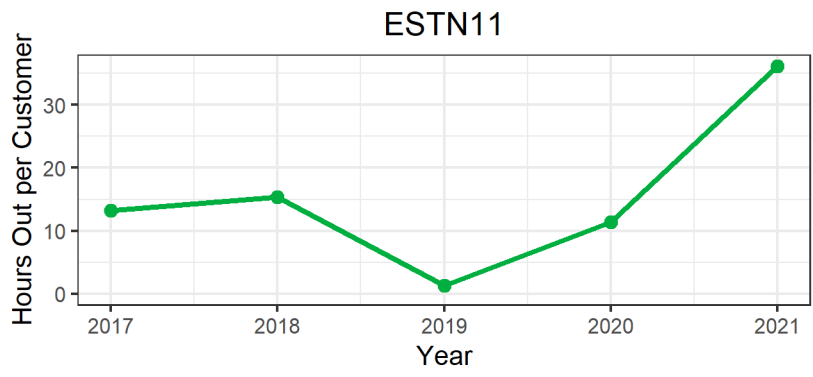
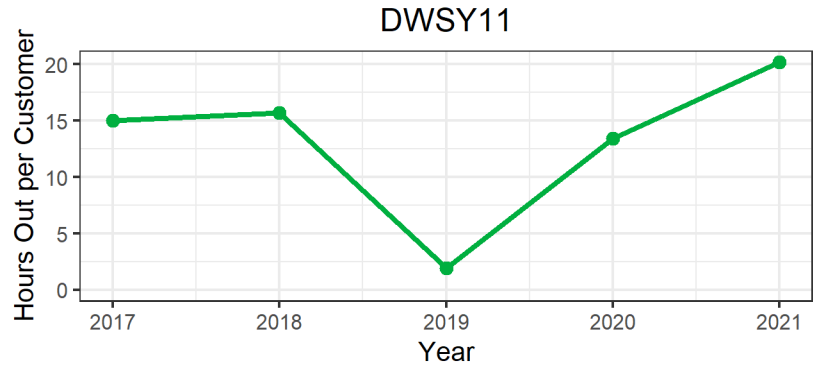
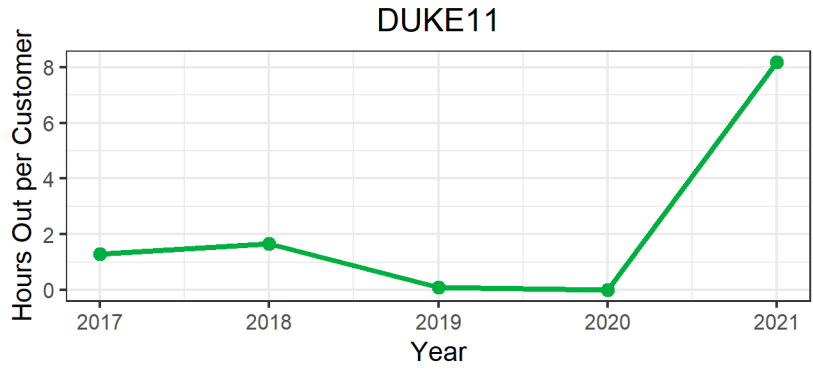
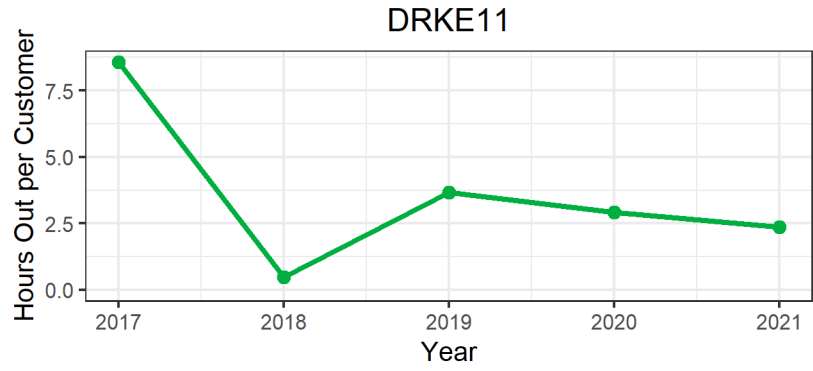
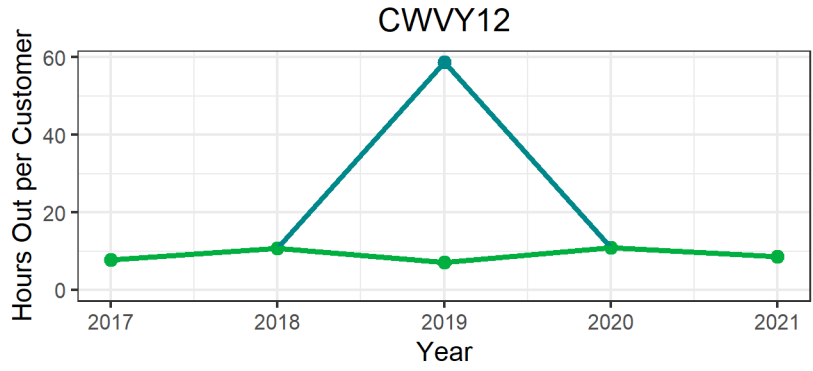
# CIRCUIT SAIDI, SAIFI AND MAIFI<sub>E</sub>

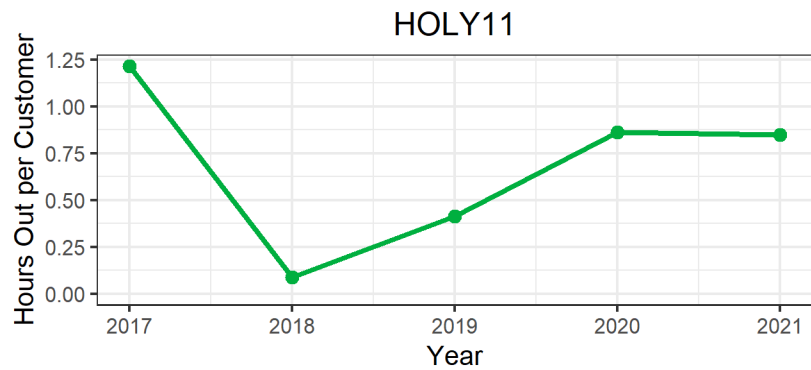
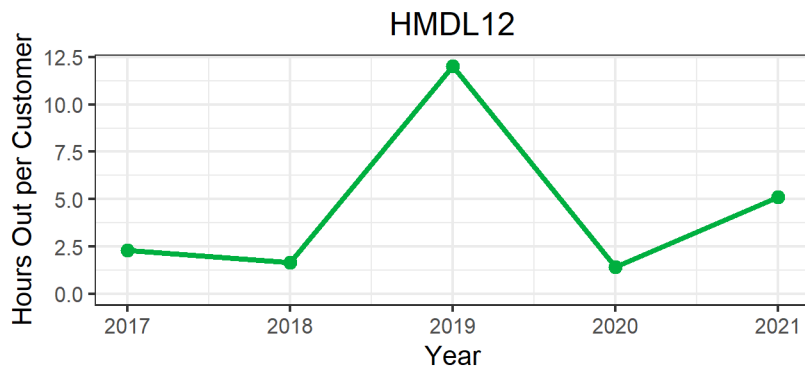
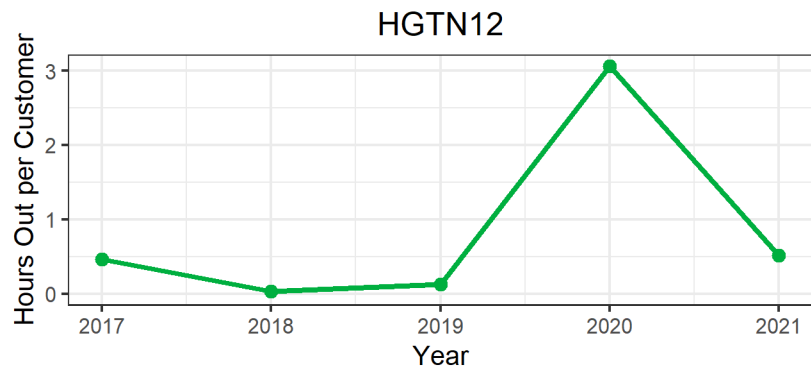
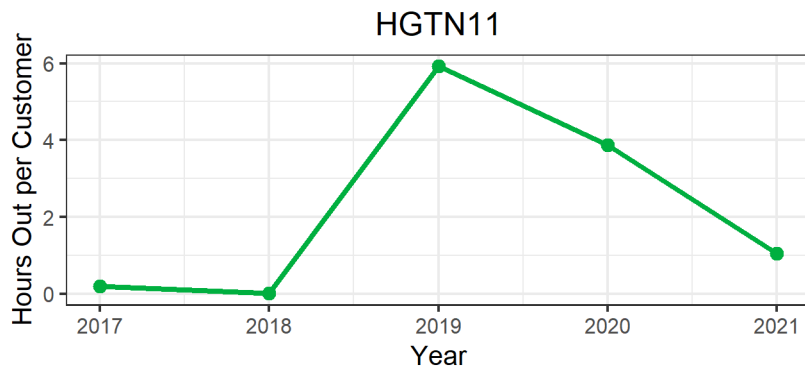
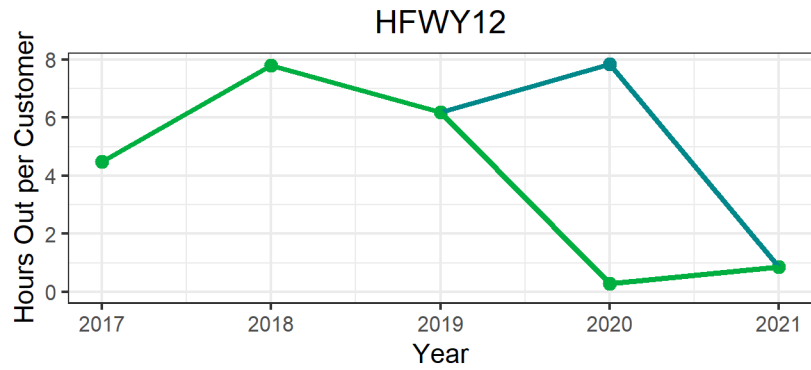
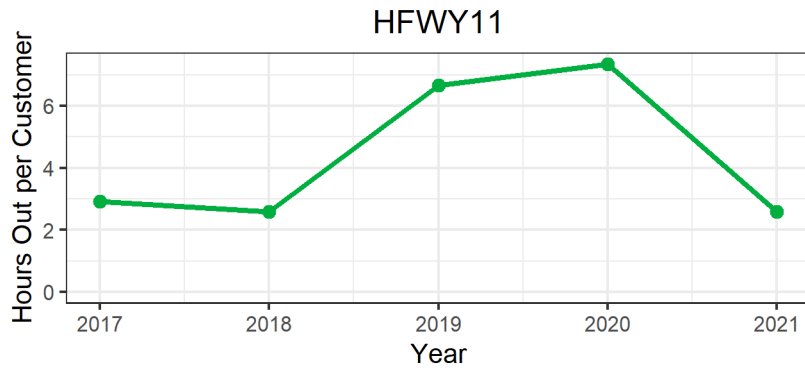
## Five Years of Circuit SAIDI

Circuit	2017	2018	2019	2020	2021	2021 MedEx
ADRN11	8.60	0.83	0.99	3.68	3.93	3.93
ADRN12	17.14	0.41	0.19	2.19	6.21	6.21
CARO11	1.49	2.70	0.28	3.89	3.78	3.78
CARO12	1.56	0.99	0.65	0.66	2.42	2.42
CARO13	0.17	0.13	0.16	0.86	4.71	4.71
CWVY11	0.74	16.00	5.93	11.00	1.96	1.96
CWVY12	7.78	10.77	59.83	10.99	8.55	8.55
DRKE11	8.44	0.48	3.70	2.93	2.35	2.35
DUKE11	1.34	1.90	0.11	0.00	8.18	8.18
DWSY11	15.18	15.68	1.94	13.44	20.21	20.21
ESTN11	13.21	15.40	1.27	11.40	36.14	36.14
HCSU11	0.00	0.00	0.00	0.00	0.00	0.00
HFVY11	2.94	2.60	6.70	7.36	2.58	2.58
HFVY12	4.50	7.87	6.20	7.84	0.86	0.86
HGTN11	0.21	0.01	6.00	3.88	1.06	1.06
HGTN12	0.47	0.03	0.13	3.06	0.52	0.52
HMDL12	2.32	1.67	12.11	1.43	5.10	5.10
HOLY11	1.23	0.09	0.43	0.86	0.85	0.85
HOLY12	7.60	0.41	1.72	0.92	0.64	0.64
HOLY13	0.19	1.35	3.69	1.08	1.35	1.35
HOLY14	NA	NA	1.33	0.00	0.00	0.00
HOPE11	1.87	3.32	1.36	6.11	6.46	6.46
HRPR11	8.10	2.03	3.66	14.32	15.33	15.33
HRPR12	21.23	6.02	4.54	9.70	25.32	25.32
JMSN11	0.60	2.24	6.41	3.50	2.09	2.09
JMSN12	2.07	1.10	1.18	2.15	4.34	4.34
JNTA11	6.65	3.93	1.31	10.89	20.88	20.88
JNTA12	7.56	4.73	1.33	12.08	34.56	34.56
JNVY11	11.30	2.59	0.17	17.02	0.09	0.09
JNVY12	10.75	1.70	0.10	16.29	2.64	2.64
JNVY31	14.50	3.37	6.40	19.07	13.73	13.73
LIME11	27.62	5.65	1.47	6.87	2.92	2.92
MRBT41	11.96	2.78	2.61	4.15	5.28	5.28
MRBT42	1.54	2.65	1.78	0.00	6.29	6.29
NYSA11	0.37	0.21	3.23	0.10	1.42	1.42
NYSA12	6.95	1.87	1.12	0.20	3.49	3.49
NYSA13	0.27	0.22	0.77	1.71	0.72	0.72
NYSA14	0.12	0.22	1.21	0.31	2.14	2.14
NYSA15	0.00	0.00	0.00	0.00	329.78	329.78
OBPR11	0.00	0.00	0.00	0.00	0.00	0.00
OIDA11	1.12	0.78	1.73	2.77	3.05	3.05
OIDA12	2.80	0.00	5.58	0.00	0.00	0.00
ONTO14	0.54	0.00	0.04	0.00	0.00	0.00
ONTO18	0.12	1.48	0.55	0.03	0.32	0.32
ONTO19	0.69	2.05	0.59	0.55	2.52	2.52
ONTO20	0.64	0.51	0.63	0.98	0.54	0.54
ONTO23	4.07	0.28	0.00	0.00	1.23	1.23
ONTO24	5.23	11.00	2.13	0.48	1.94	1.94
ONTO25	0.37	0.12	1.50	0.03	0.11	0.11
OYDM11	3.48	0.28	2.97	0.00	3.87	3.87
PNCK11	0.26	0.69	1.38	27.39	0.00	0.00
PNCK12	3.17	0.00	0.00	4.48	12.97	12.97
PRMA12	7.22	5.04	0.23	0.00	6.61	6.61
PRMA42	12.84	7.15	0.89	5.95	12.50	12.50
RKVL11	4.61	1.29	0.30	17.07	0.05	0.05
UNTY11	27.58	12.35	0.30	5.99	2.37	2.37
UNTY12	17.21	11.57	0.81	6.85	7.66	7.66
VALE11	1.09	0.92	0.33	0.10	4.10	4.10
VALE12	1.07	0.15	0.00	0.00	0.70	0.70
VALE13	3.68	0.69	0.34	3.42	3.15	3.15
VALE14	2.93	6.49	0.31	3.14	1.68	1.68
VALE15	1.82	2.72	0.26	0.48	1.18	1.18
WESR13	3.21	1.89	1.37	1.04	5.26	5.26
WESR14	12.55	6.98	1.62	1.71	8.70	8.70

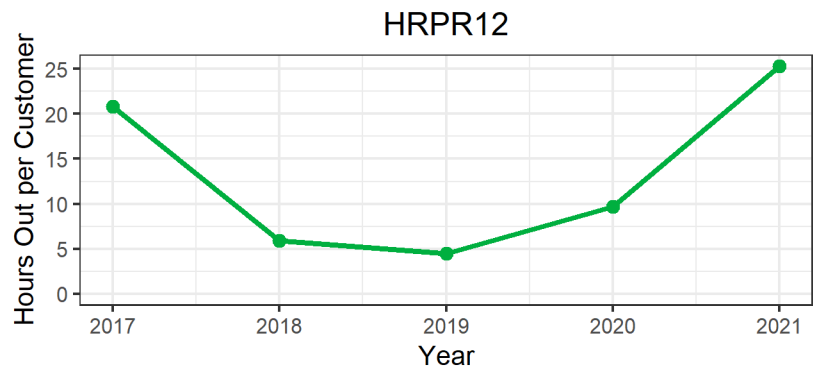
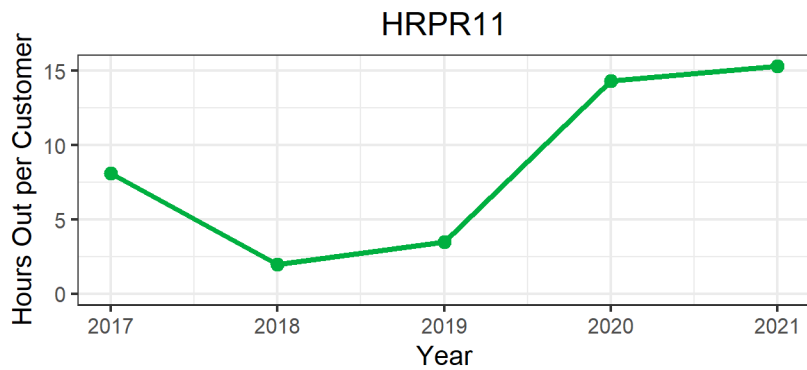
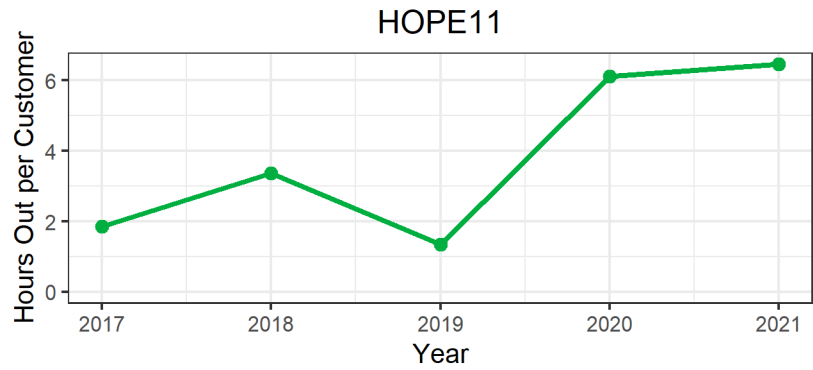
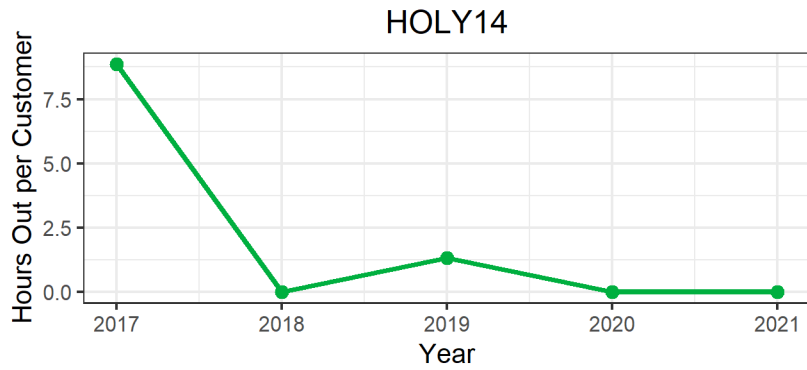
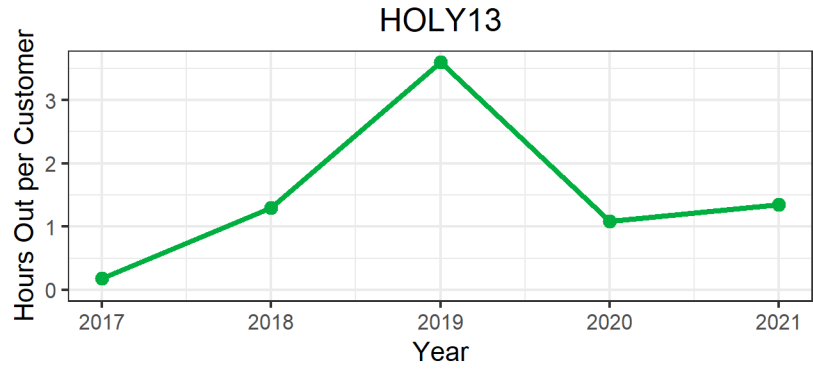
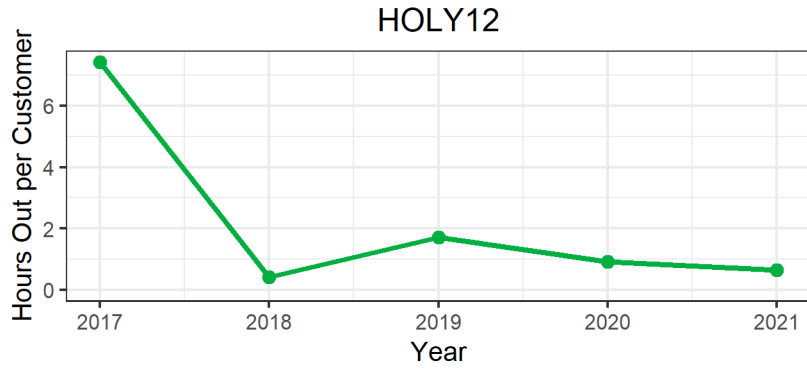
Table 6 Five Years of Circuit SAIDI

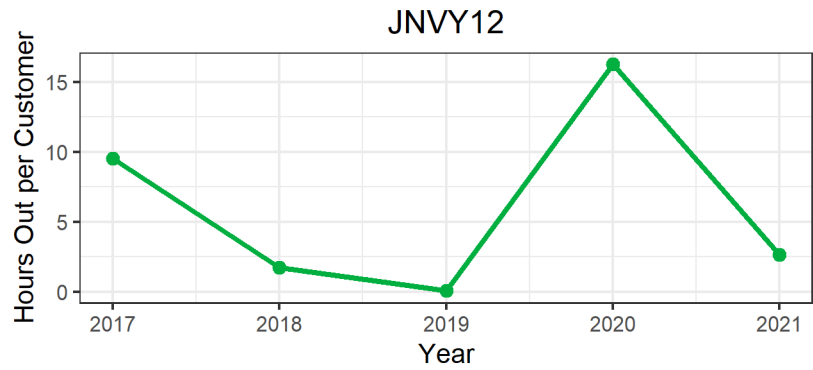
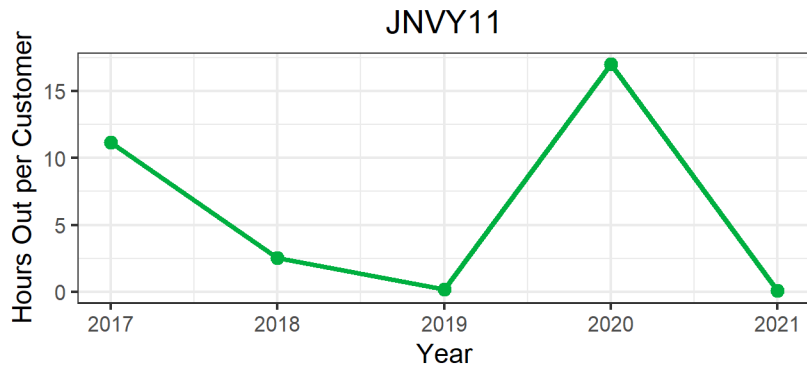
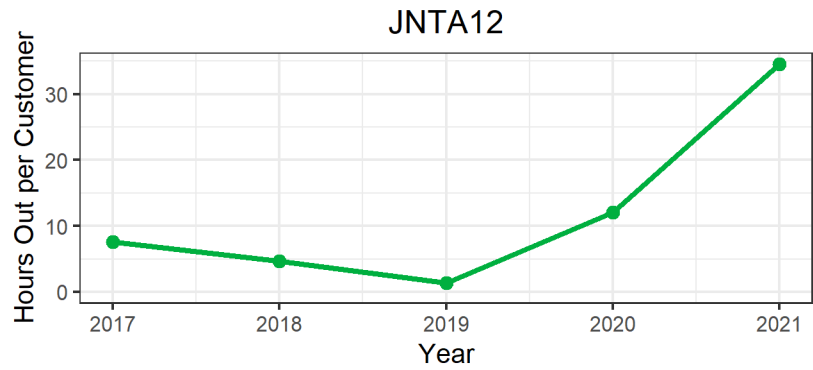
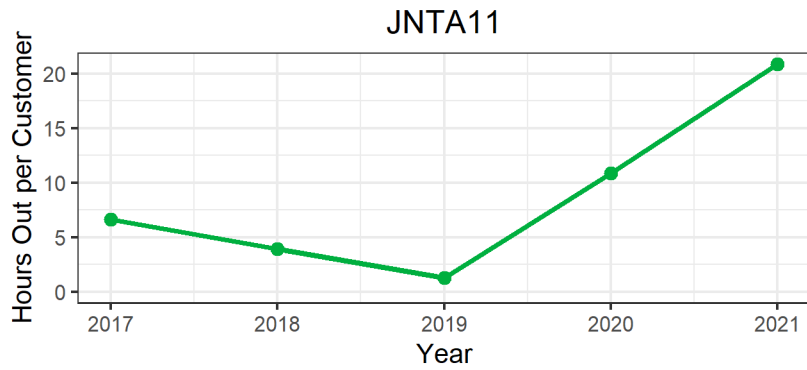
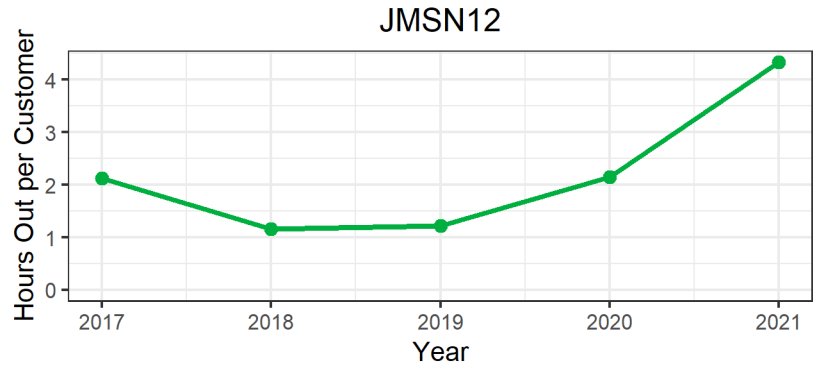
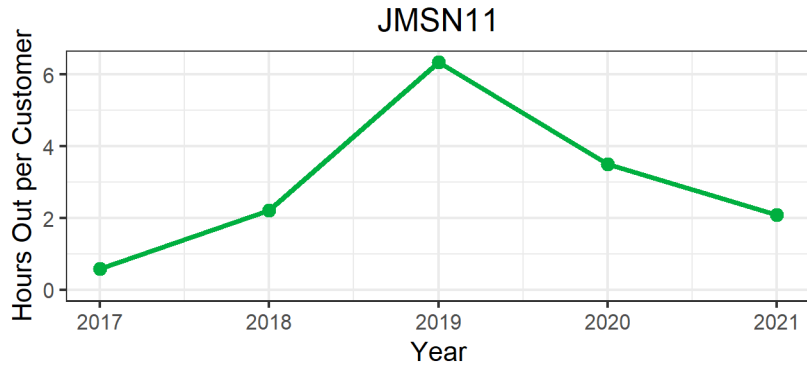


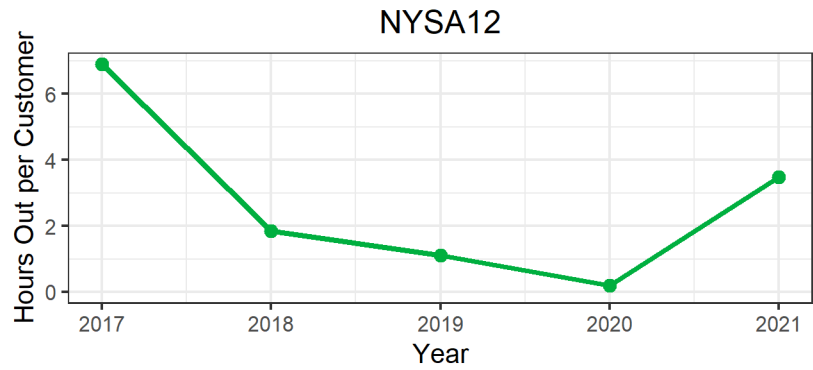
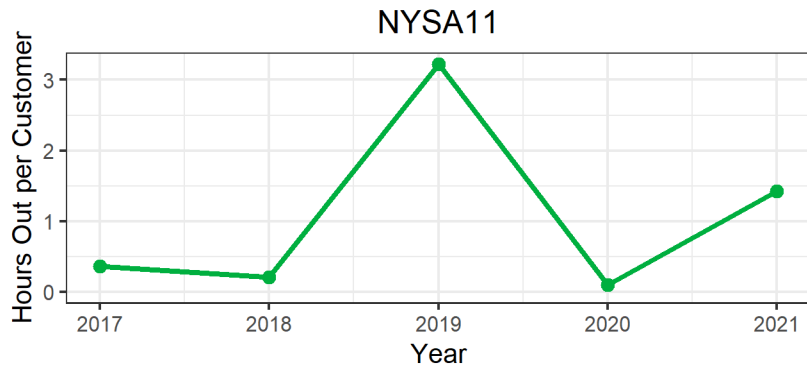
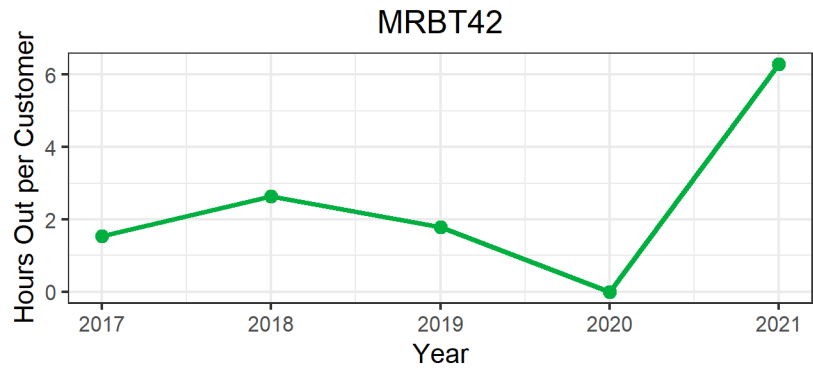
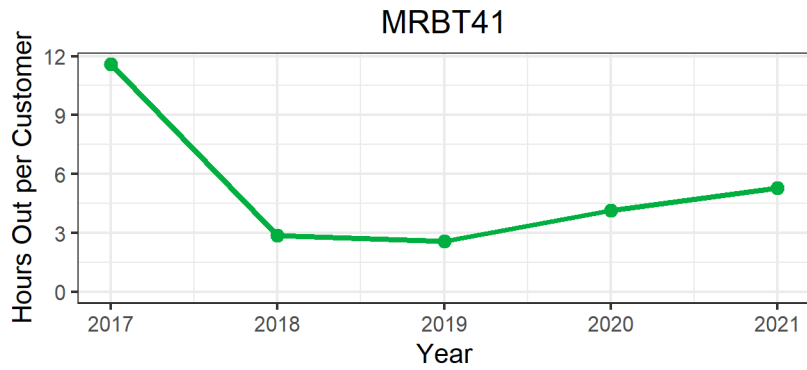
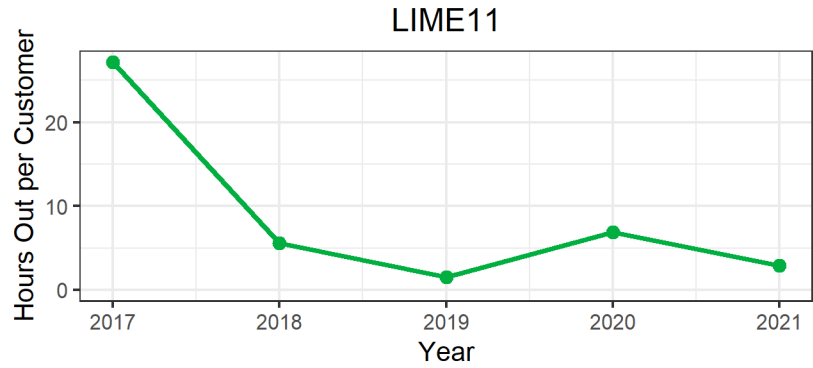
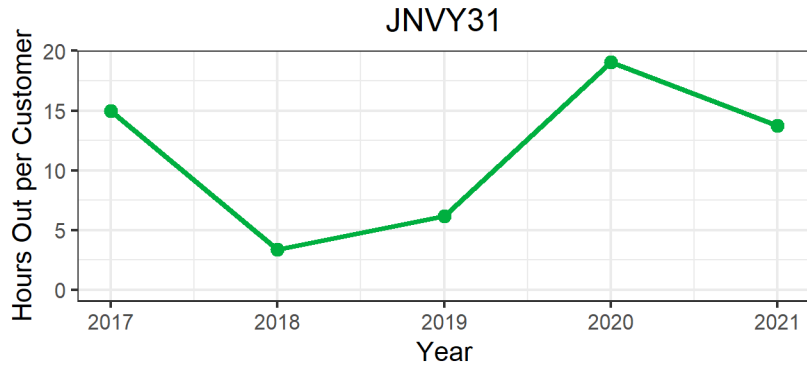


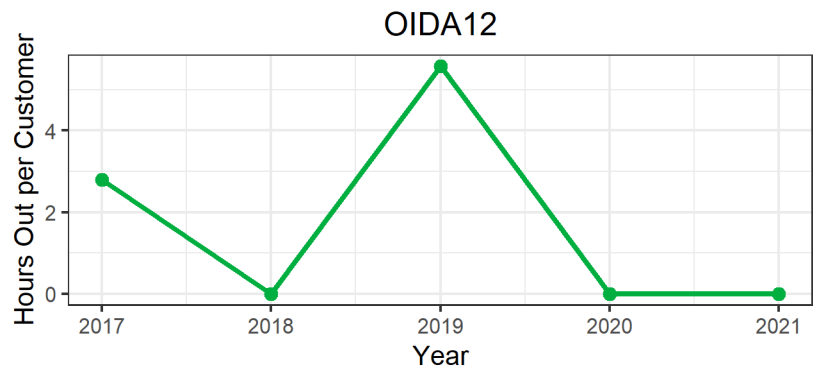
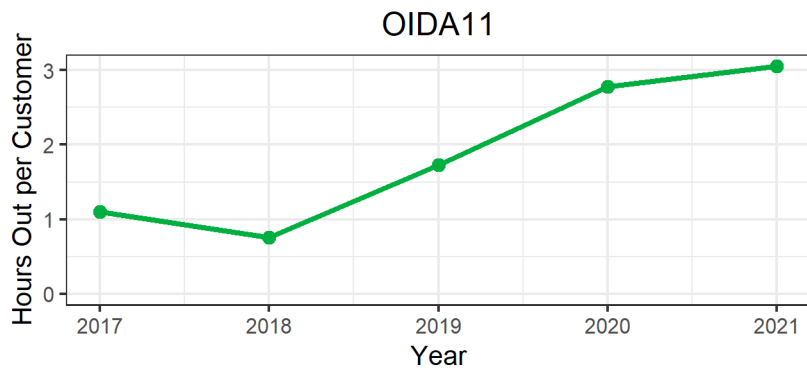
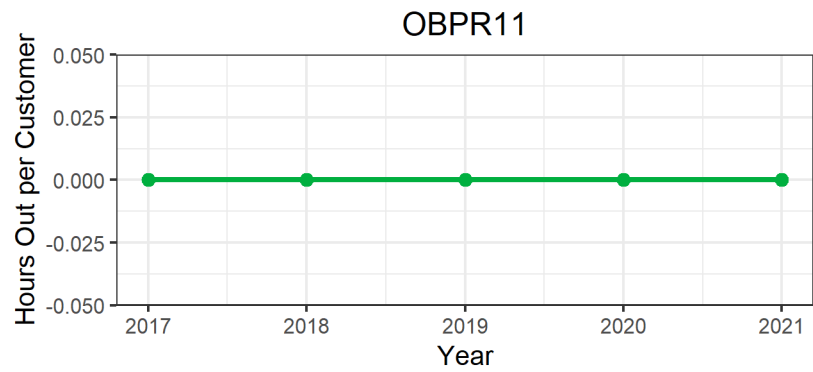
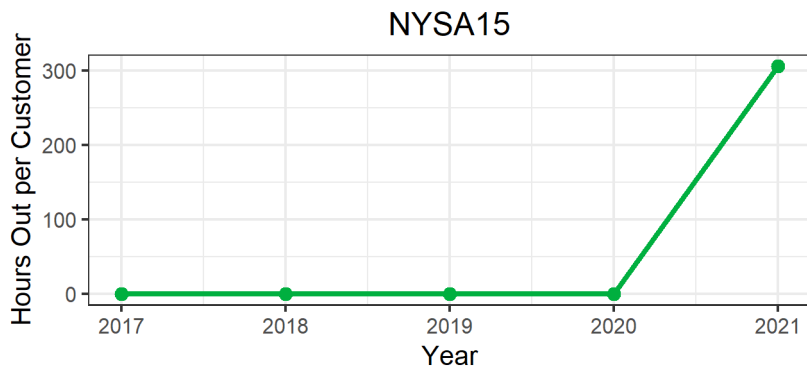
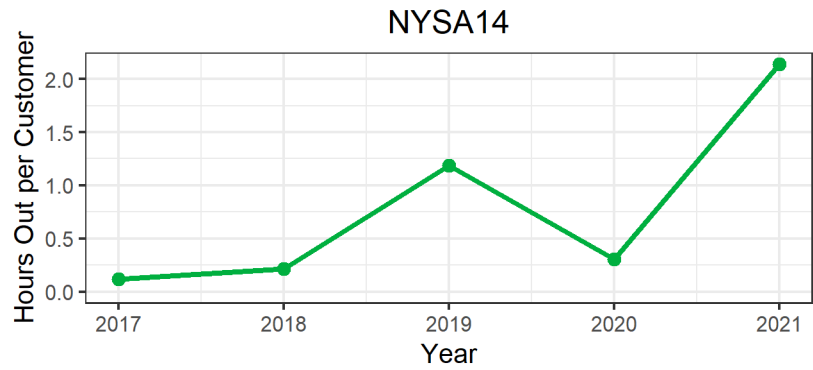
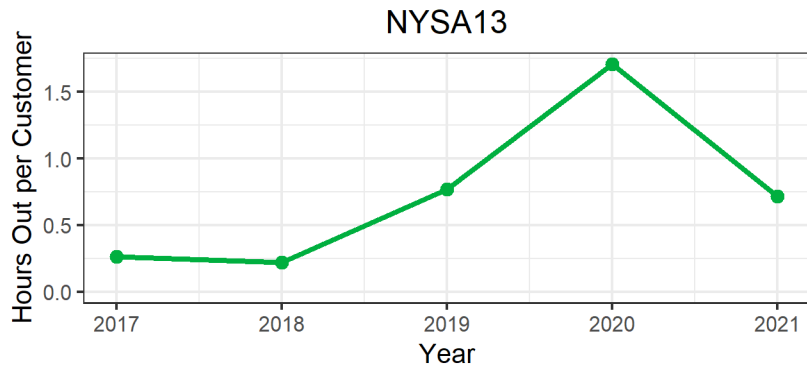


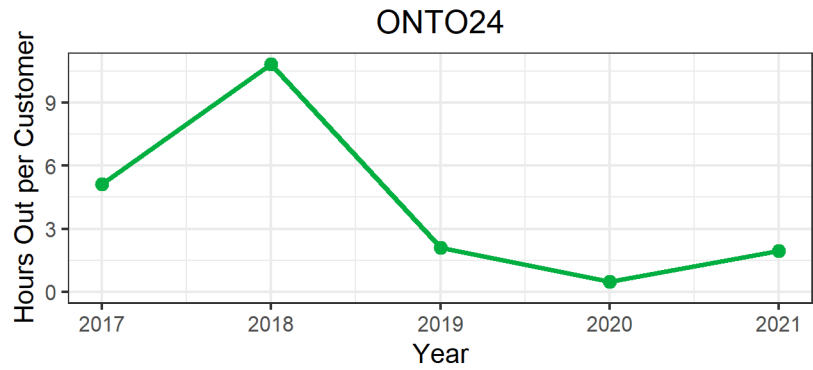
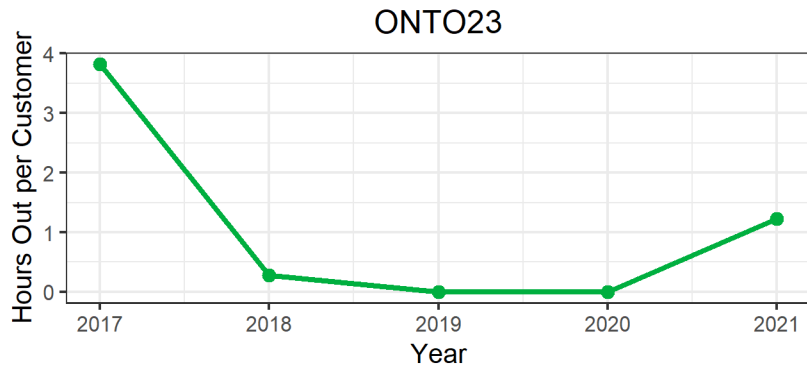
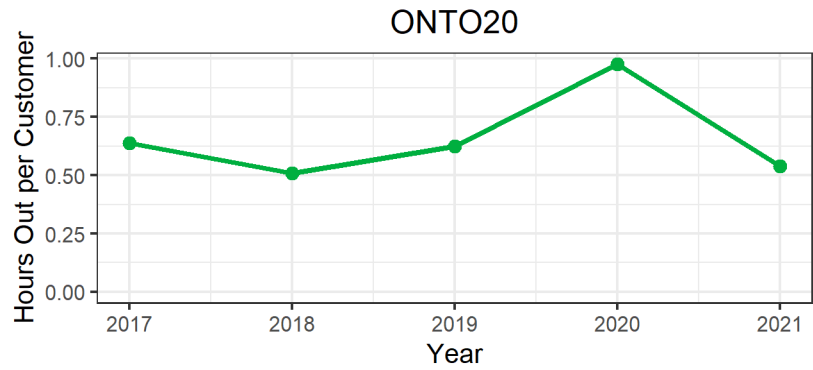
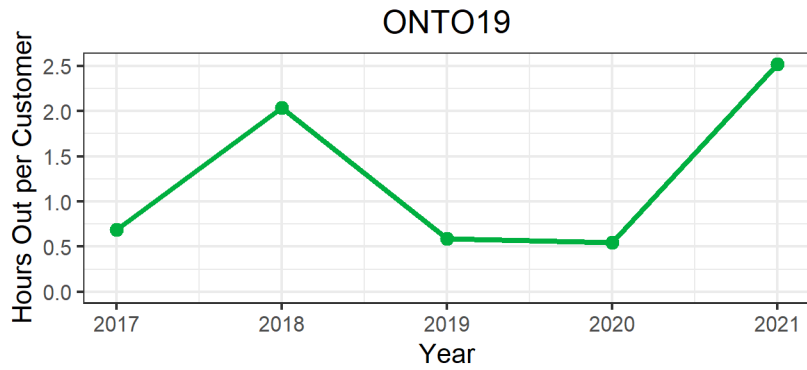
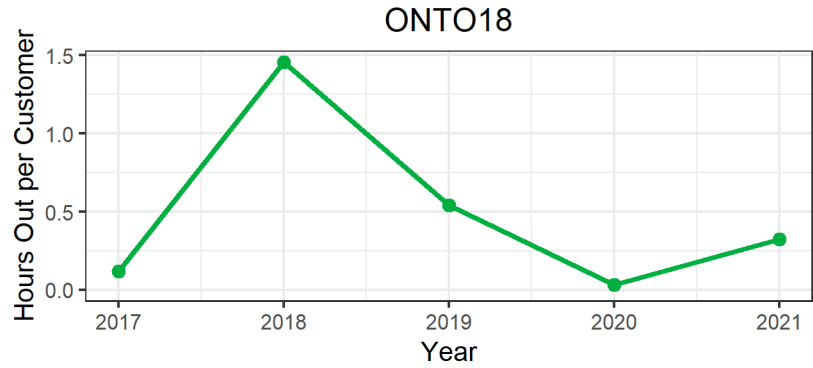
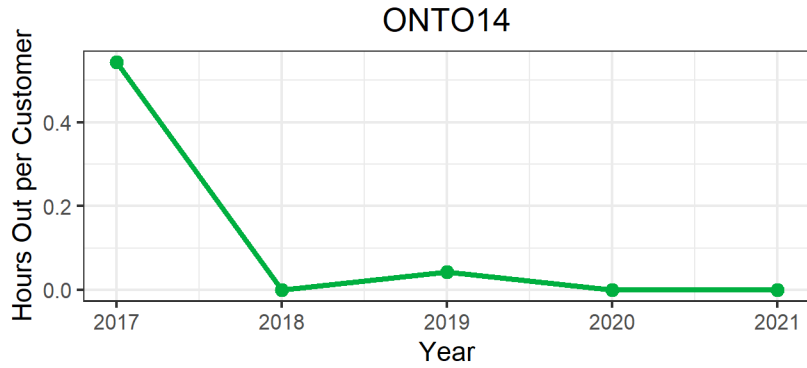


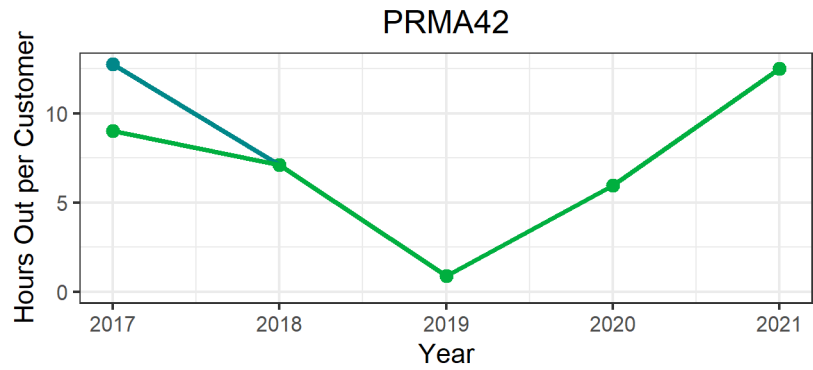
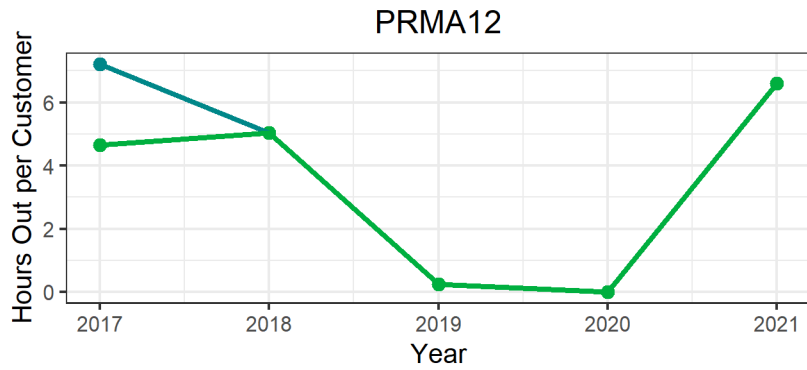
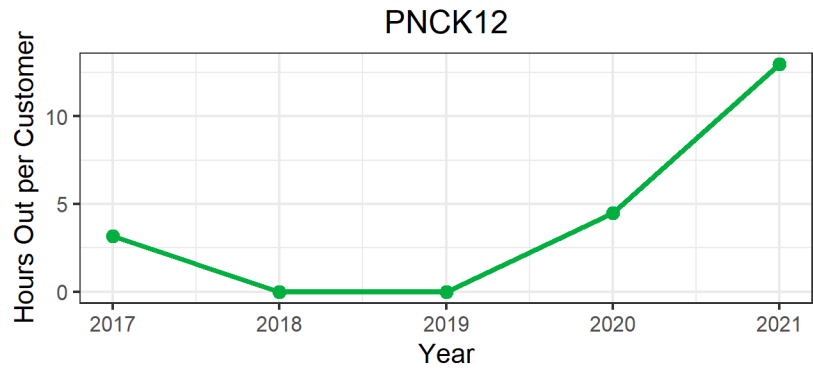
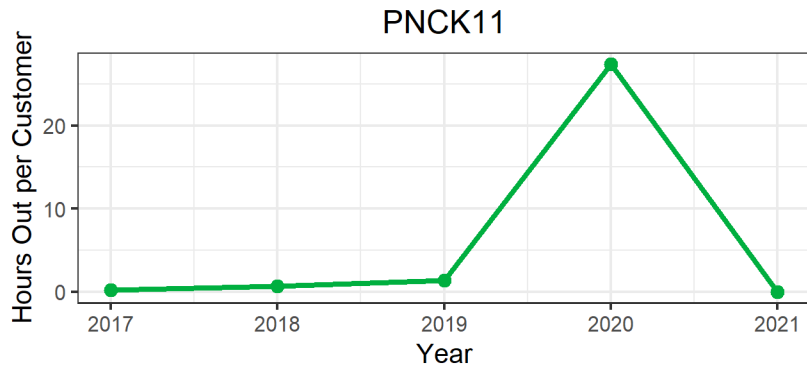
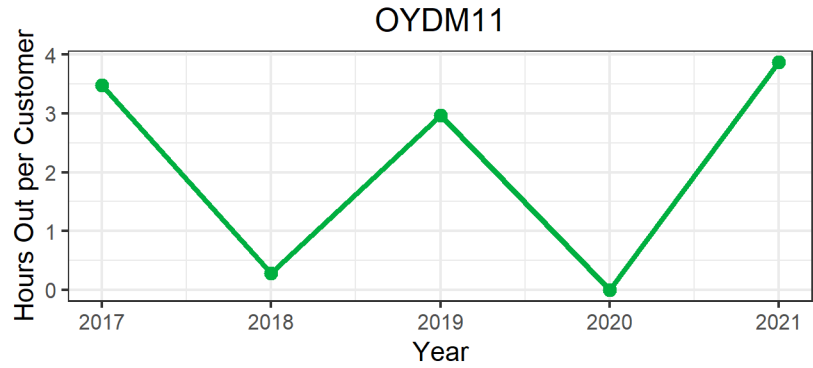
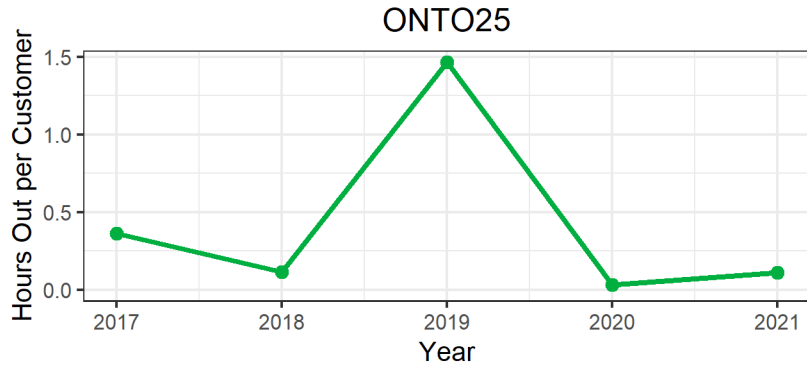


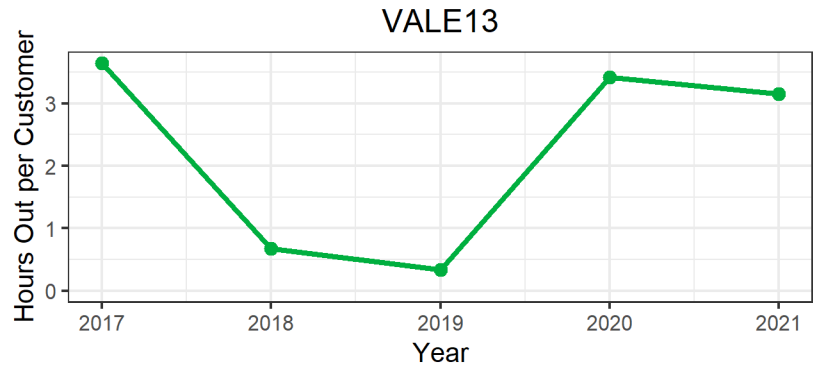
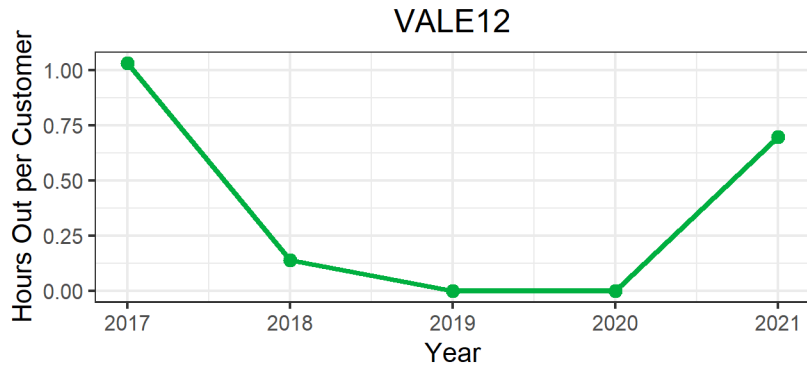
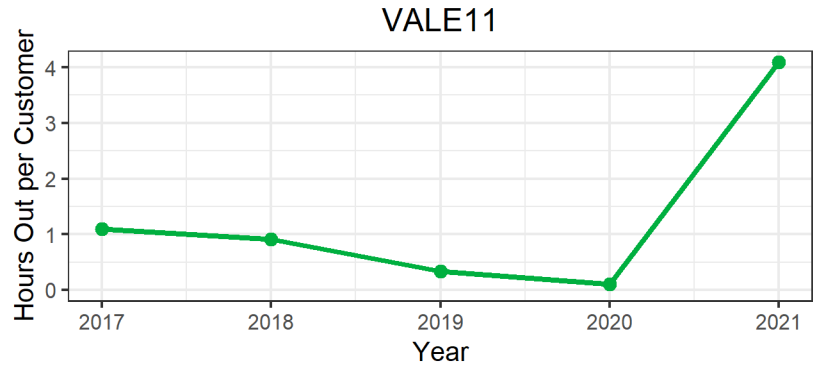
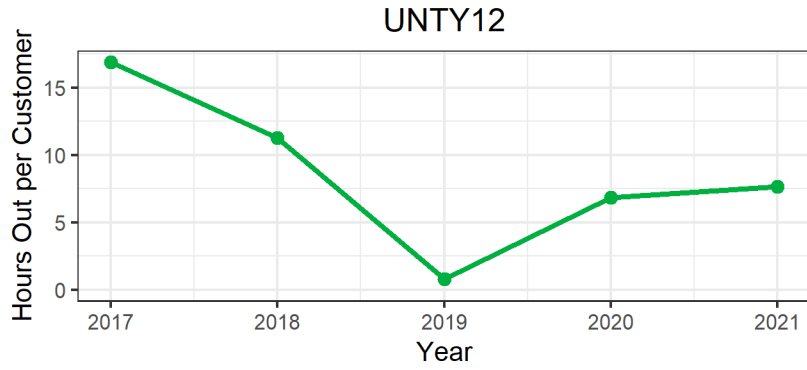
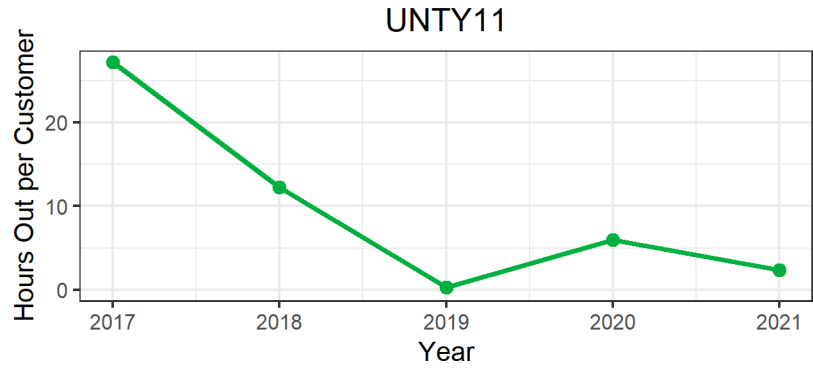
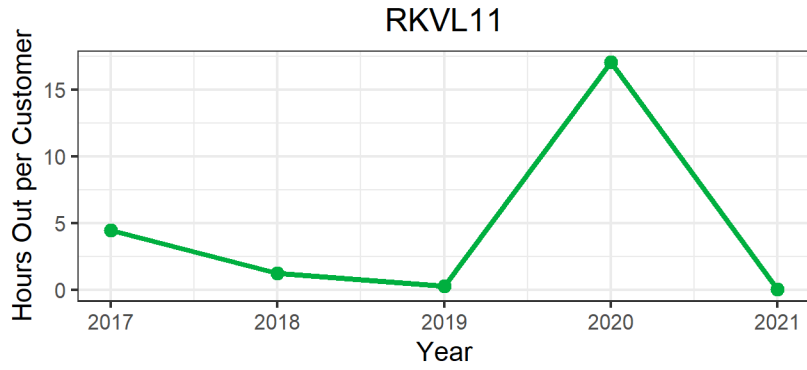












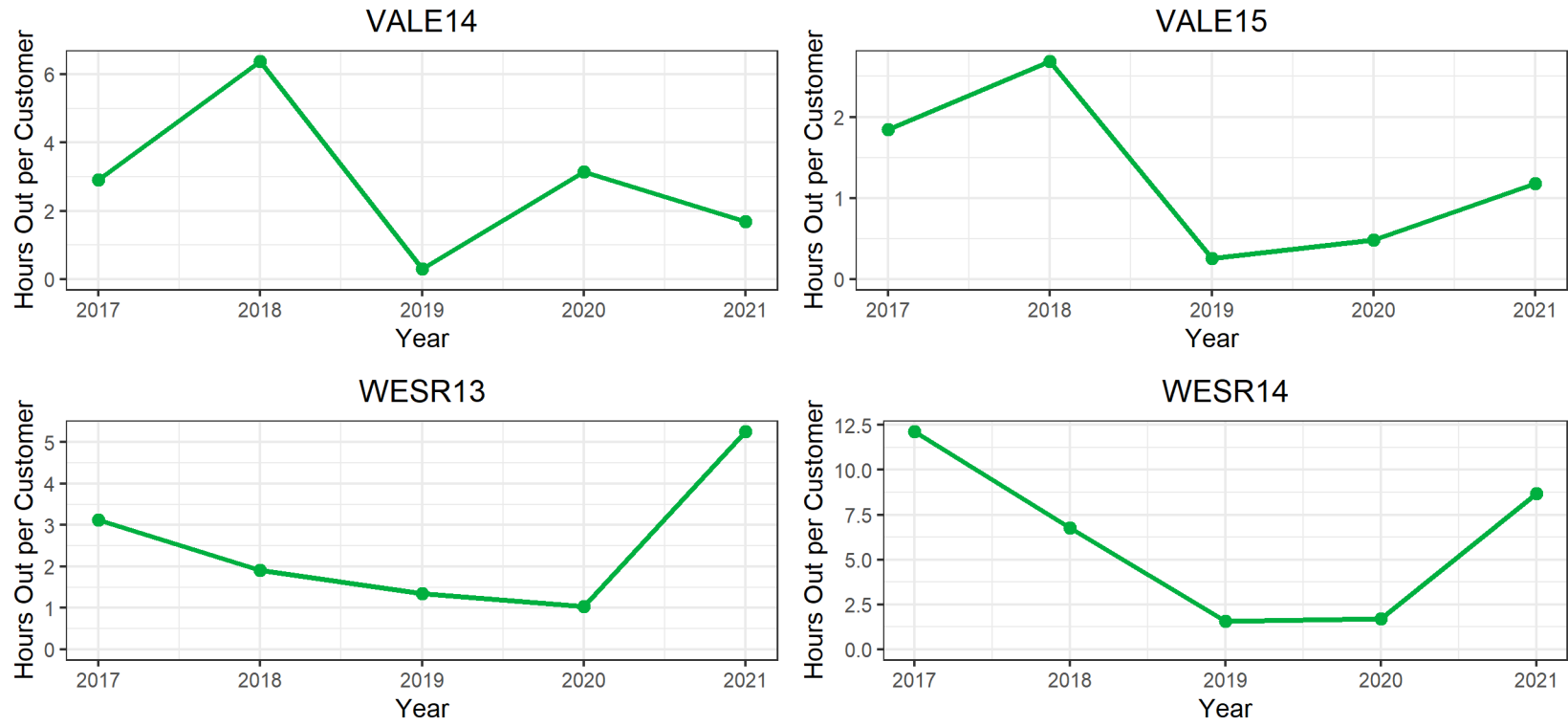


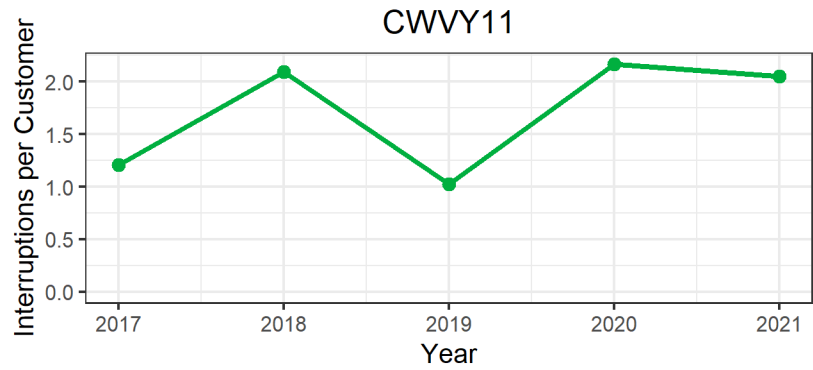
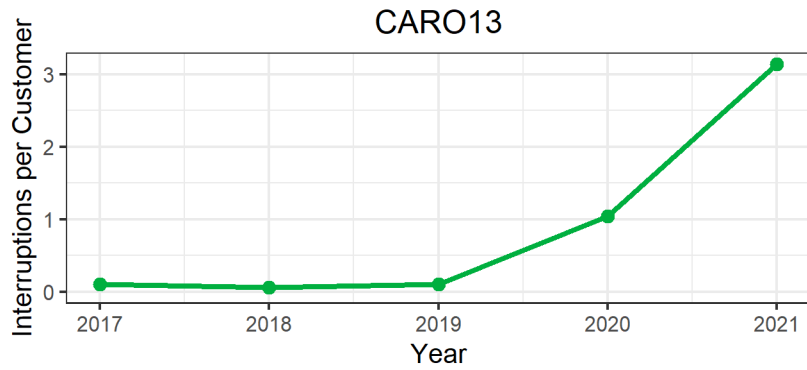
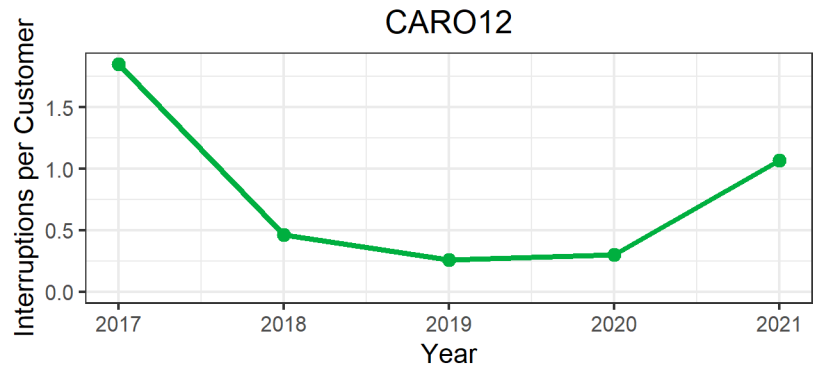
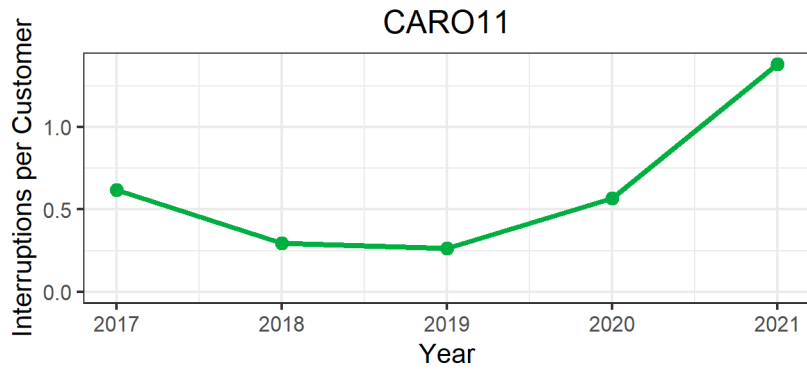
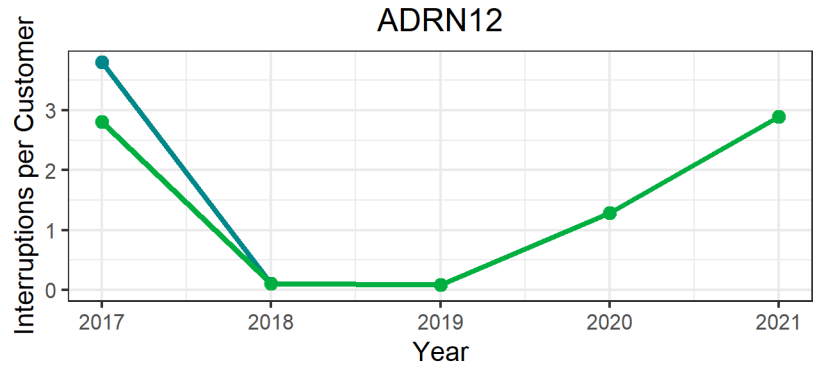
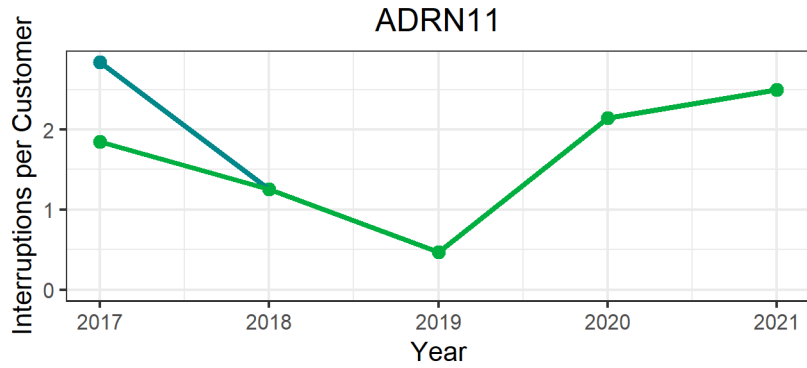
Figure 6 Five Years of Circuit SAIDI

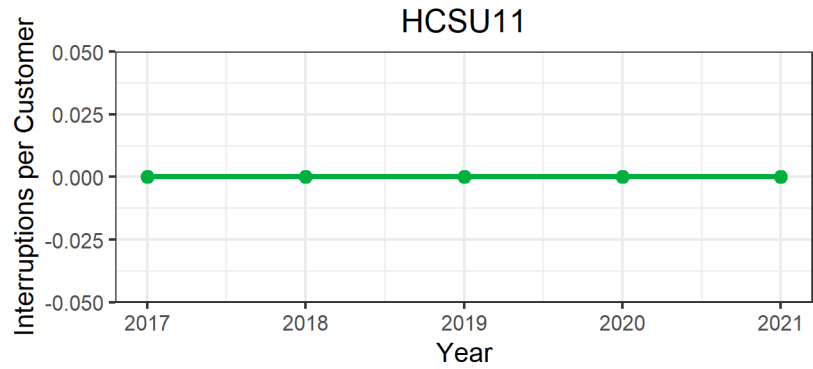
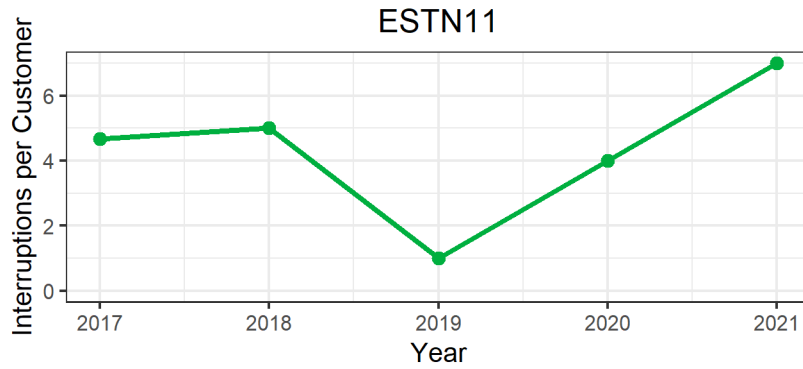
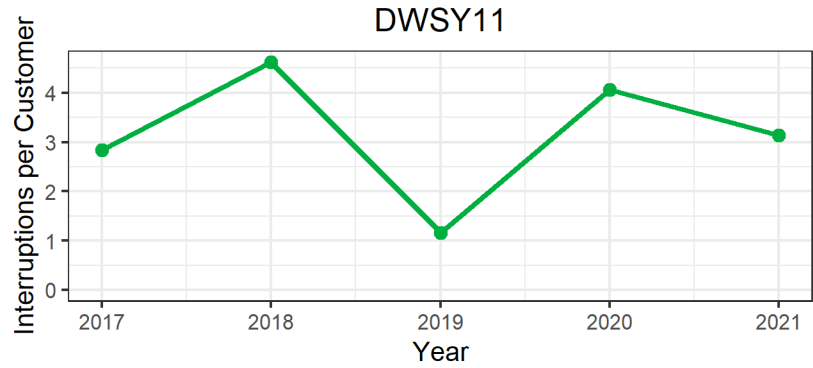
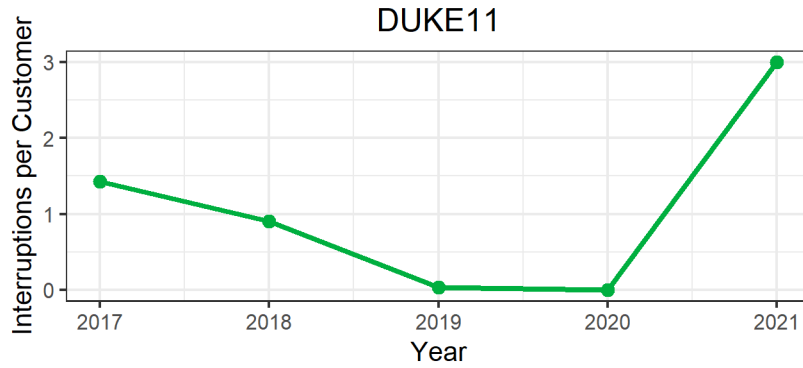
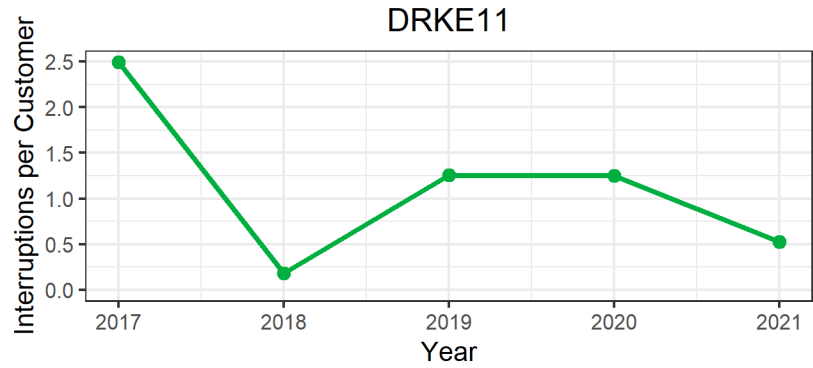
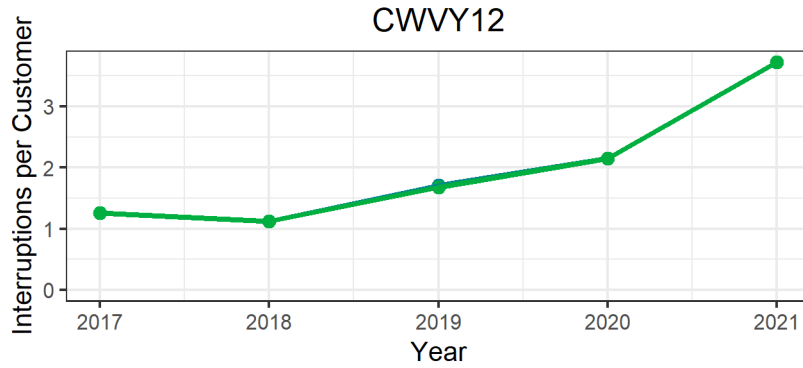


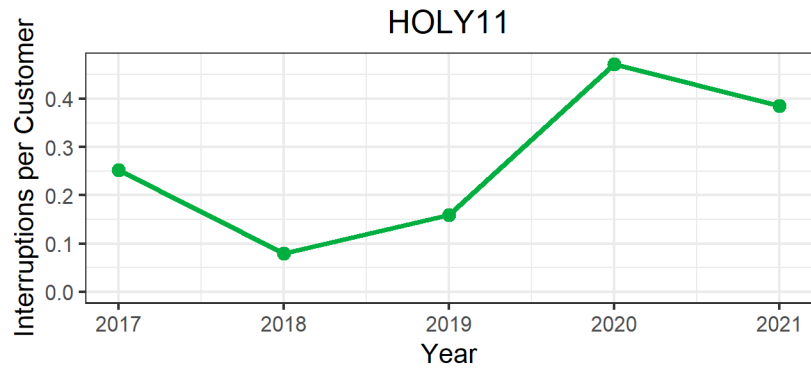
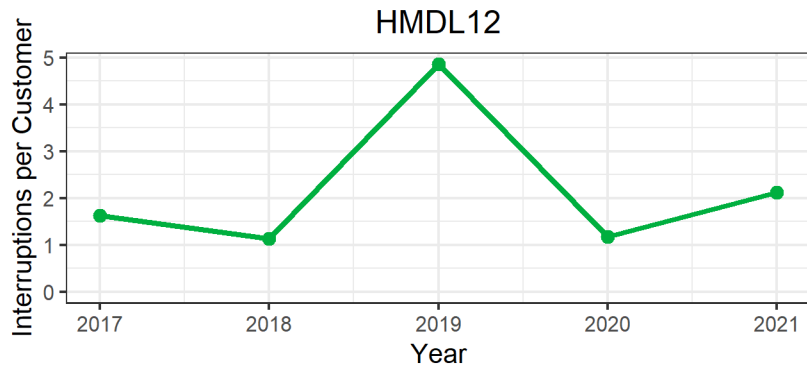
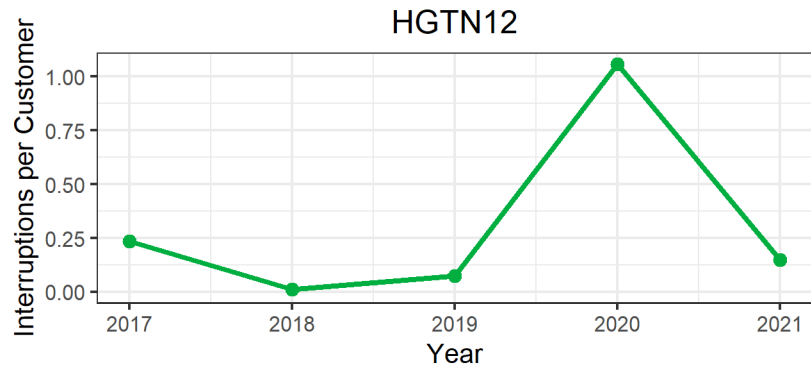
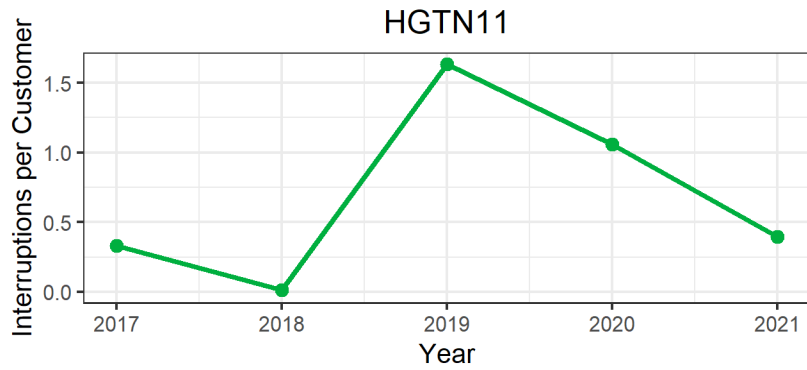
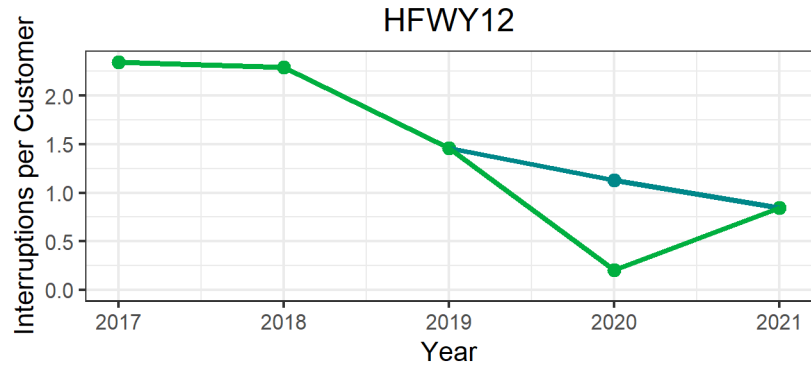
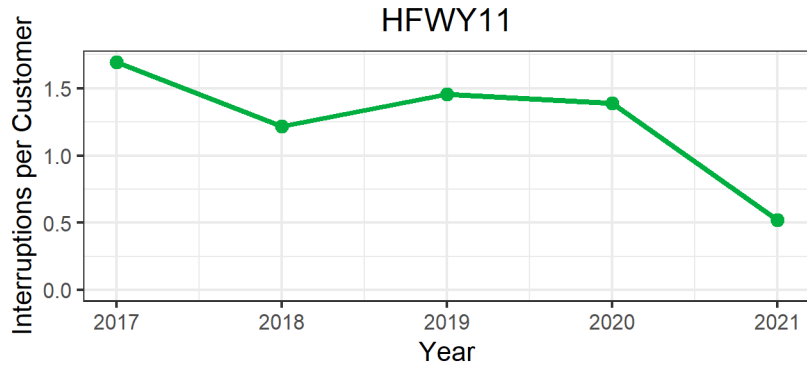
## Five Years of Circuit SAIFI

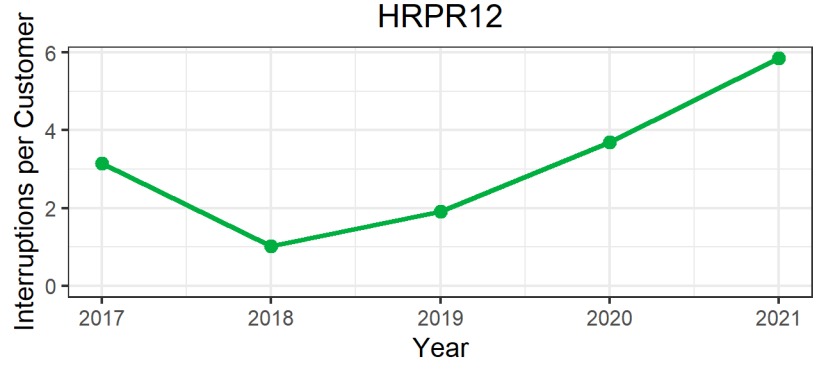
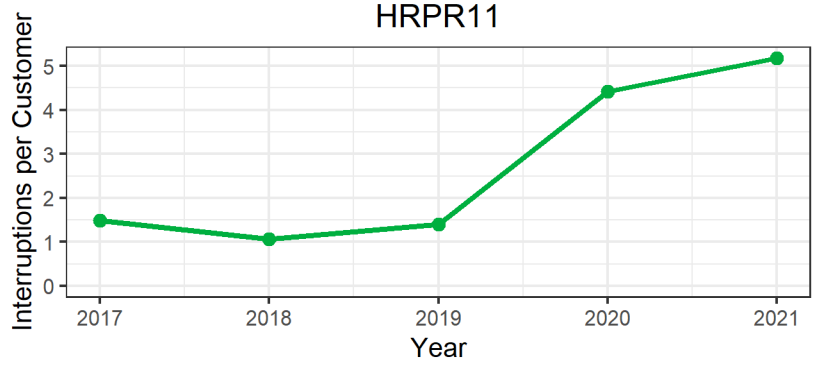
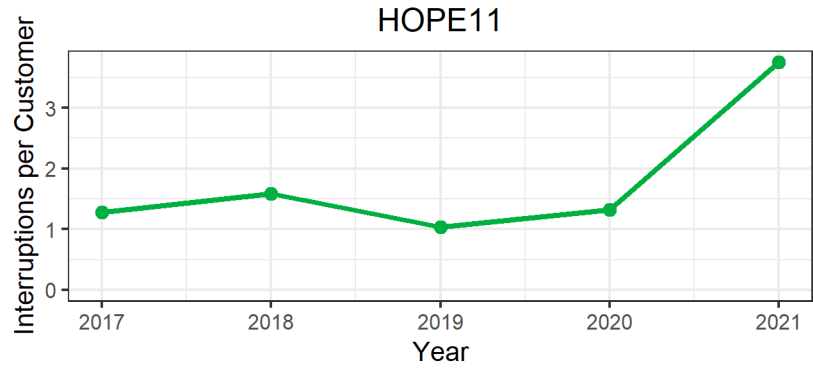
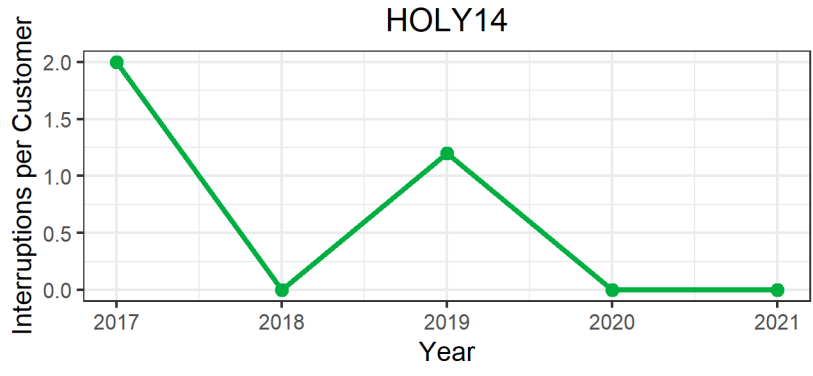
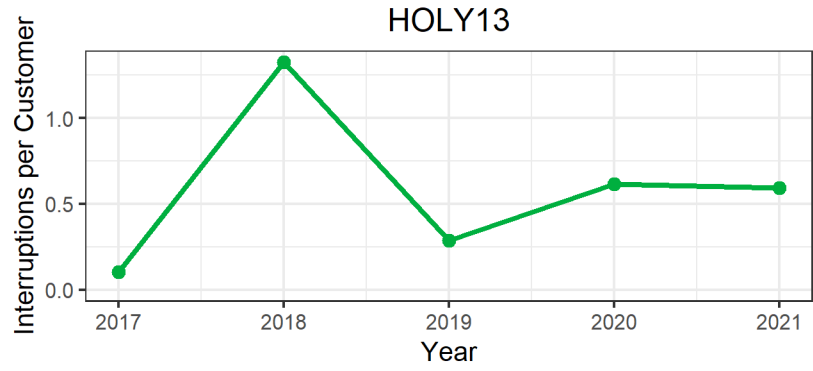
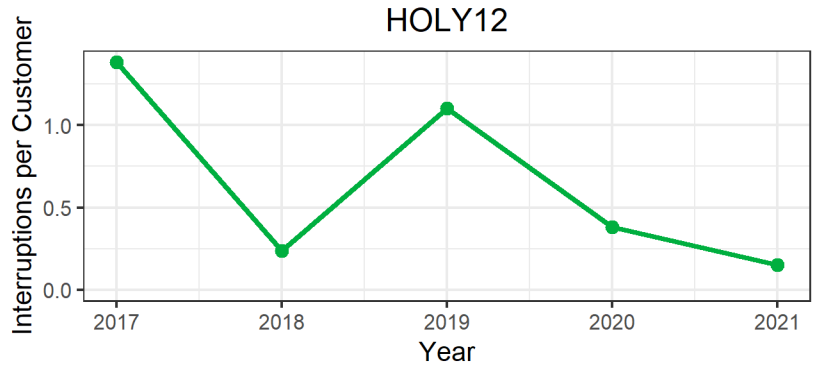
Circuit	2017	2018	2019	2020	2021	2021 MedEx
ADRN11	2.85	1.29	0.48	2.14	2.49	2.49
ADRN12	3.84	0.11	0.08	1.29	2.90	2.90
CARO11	0.62	0.30	0.27	0.57	1.38	1.38
CARO12	1.87	0.46	0.26	0.30	1.07	1.07
CARO13	0.11	0.06	0.10	1.04	3.14	3.14
CWVY11	1.20	2.14	1.02	2.17	2.05	2.05
CWVY12	1.27	1.13	1.74	2.15	3.73	3.73
DRKE11	2.46	0.18	1.27	1.25	0.52	0.52
DUKE11	1.48	1.04	0.04	0.00	3.00	3.00
DWSY11	2.87	4.63	1.16	4.06	3.14	3.14
ESTN11	4.67	5.00	1.00	4.00	7.00	7.00
HCSU11	0.00	0.00	0.00	0.00	0.00	0.00
HFVY11	1.71	1.23	1.46	1.39	0.52	0.52
HFVY12	2.36	2.32	1.46	1.13	0.85	0.85
HGTN11	0.34	0.01	1.65	1.06	0.40	0.40
HGTN12	0.24	0.01	0.08	1.06	0.15	0.15
HMDL12	1.64	1.13	4.89	1.17	2.12	2.12
HOLY11	0.26	0.08	0.17	0.47	0.39	0.39
HOLY12	1.43	0.24	1.10	0.38	0.15	0.15
HOLY13	0.11	1.37	0.30	0.61	0.59	0.59
HOLY14	NA	NA	1.20	0.00	0.00	0.00
HOPE11	1.28	1.57	1.05	1.32	3.75	3.75
HRPR11	1.49	1.10	1.47	4.42	5.18	5.18
HRPR12	3.21	1.04	1.91	3.68	5.86	5.86
JMSN11	0.37	1.23	0.34	1.88	2.24	2.24
JMSN12	1.16	1.07	0.33	1.12	2.29	2.29
JNTA11	1.00	2.03	1.02	3.16	3.05	3.05
JNTA12	1.23	2.24	1.02	3.19	4.09	4.09
JNVY11	2.26	1.11	0.20	4.14	0.02	0.02
JNVY12	2.26	1.16	0.05	3.86	1.00	1.00
JNVY31	3.66	3.01	0.86	4.57	1.38	1.38
LIME11	2.44	1.46	0.53	2.33	1.05	1.05
MRBT41	1.22	2.15	1.59	2.03	1.09	1.09
MRBT42	1.00	3.00	1.55	0.00	1.27	1.27
NYSA11	0.19	0.18	1.44	0.05	0.76	0.76
NYSA12	3.21	1.33	1.24	1.02	2.39	2.39
NYSA13	0.16	0.15	0.34	0.78	0.30	0.30
NYSA14	0.05	0.14	1.29	0.23	1.38	1.38
NYSA15	0.00	0.00	0.00	0.00	1.85	1.85
OBPR11	0.00	0.00	0.00	0.00	0.00	0.00
OIDA11	0.74	0.29	1.15	1.63	2.08	2.08
OIDA12	2.00	0.00	2.00	0.00	0.00	0.00
ONTO14	1.09	0.00	0.06	0.00	0.00	0.00
ONTO18	0.06	1.12	0.30	0.02	0.18	0.18
ONTO19	0.29	1.22	0.31	0.19	0.70	0.70
ONTO20	0.17	0.32	0.35	0.49	0.24	0.24
ONTO23	2.17	0.21	0.00	0.00	0.46	0.46
ONTO24	1.69	2.85	1.39	0.38	1.21	1.21
ONTO25	0.13	0.17	1.08	0.04	0.05	0.05
OYDM11	0.93	0.13	0.93	0.00	1.00	1.00
PNCK11	0.96	0.25	0.35	4.82	0.00	0.00
PNCK12	1.00	0.00	0.00	1.00	2.00	2.00
PRMA12	3.00	2.33	1.00	0.00	4.67	4.67
PRMA42	4.60	2.64	0.30	2.15	6.51	6.51
RKVL11	2.25	1.00	0.03	5.22	0.03	0.03
UNTY11	6.21	2.15	0.16	2.10	2.12	2.12
UNTY12	6.81	2.06	0.21	1.65	2.92	2.92
VALE11	1.59	0.74	0.14	0.03	2.94	2.94
VALE12	0.50	0.14	0.00	0.00	1.02	1.02
VALE13	1.18	0.33	0.18	0.54	1.67	1.67
VALE14	0.91	1.59	0.12	1.67	1.66	1.66
VALE15	1.37	1.69	0.12	0.20	1.32	1.32
WESR13	2.34	1.08	0.78	0.61	2.62	2.62
WESR14	3.23	3.73	1.23	1.29	3.89	3.89

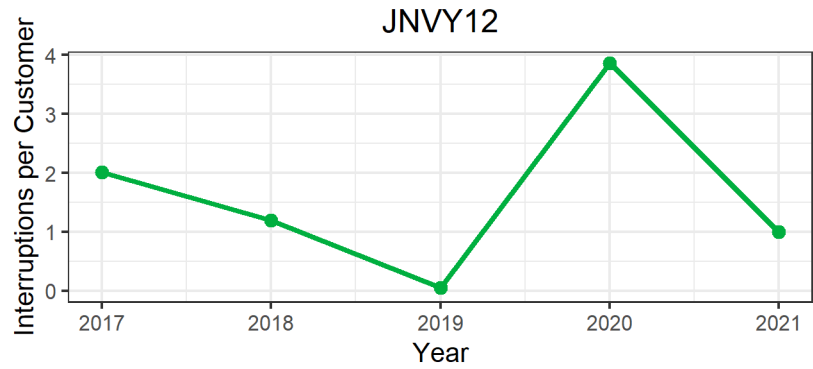
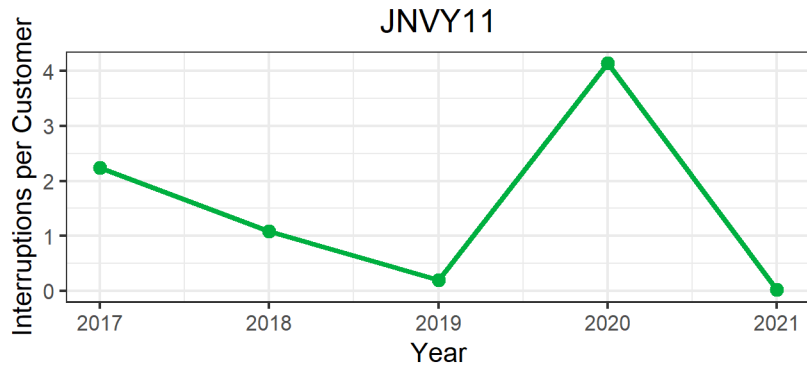
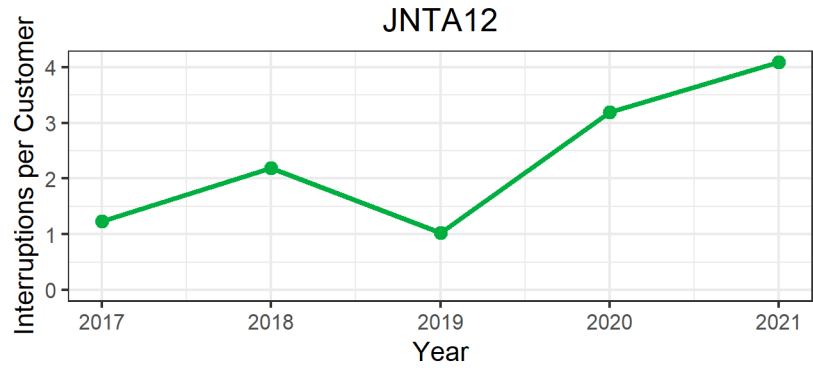
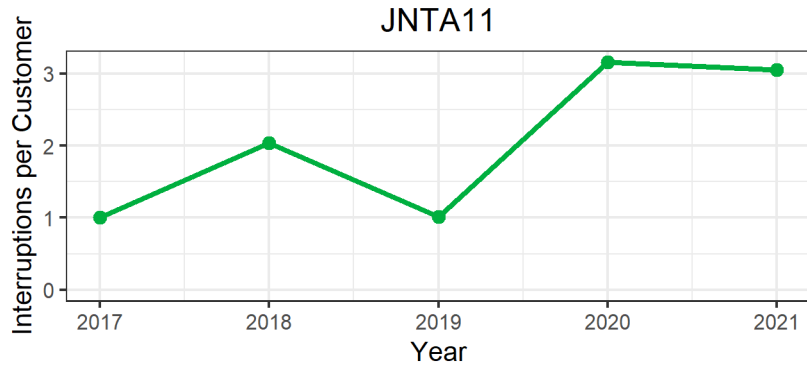
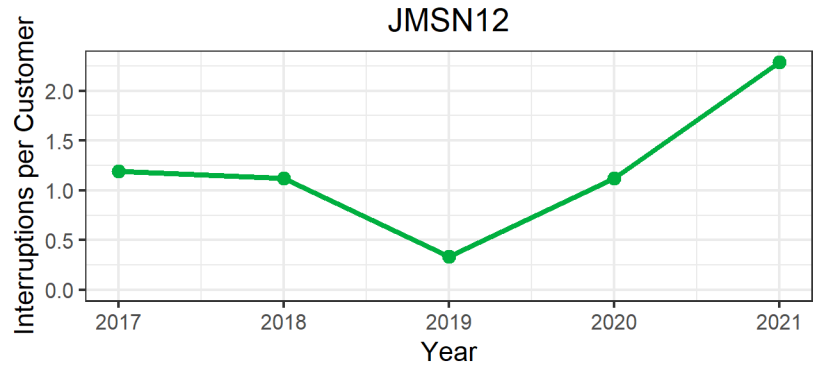
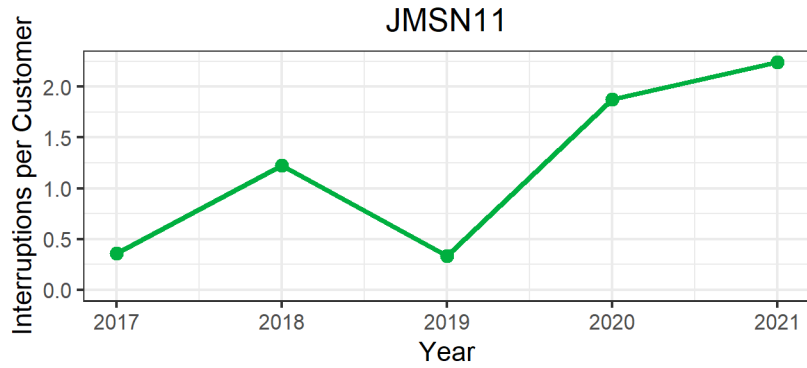
Table 7 Five Years of Circuit SAIFI

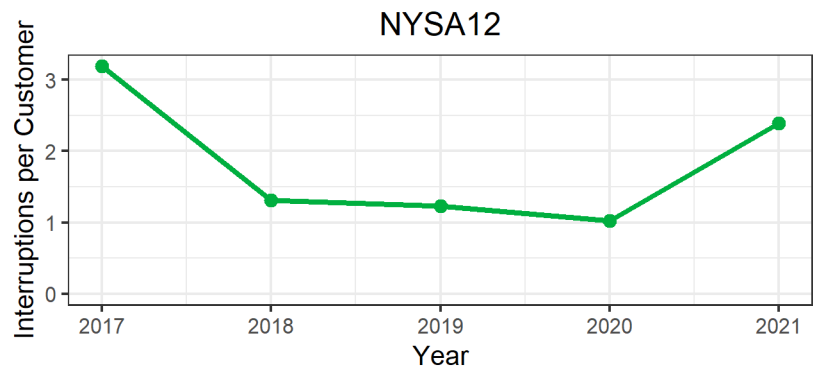
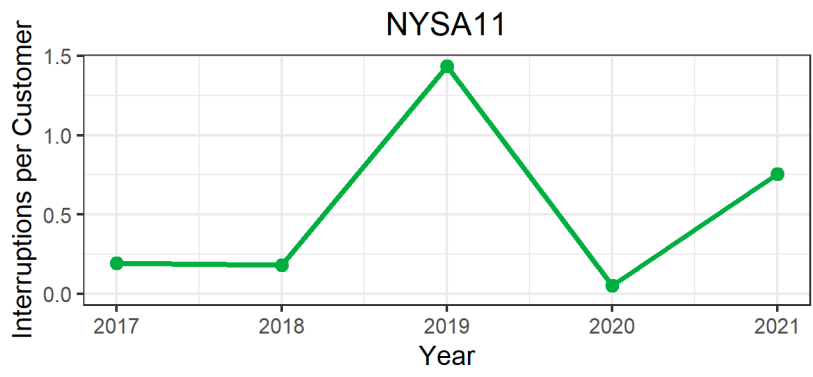
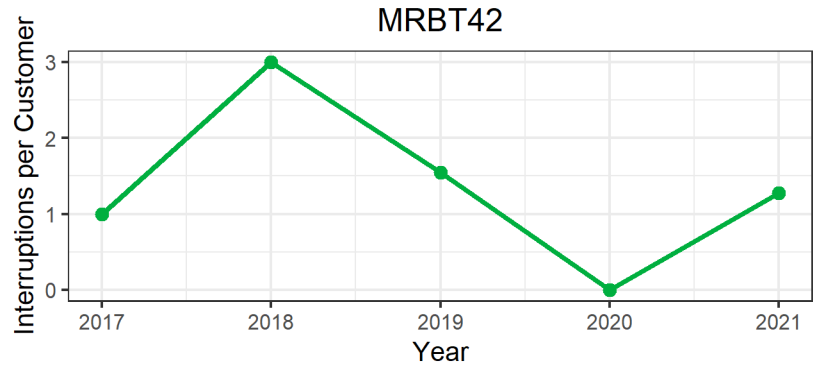
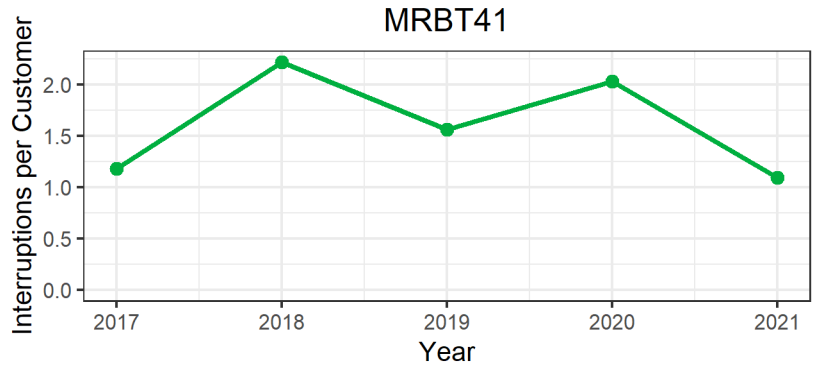
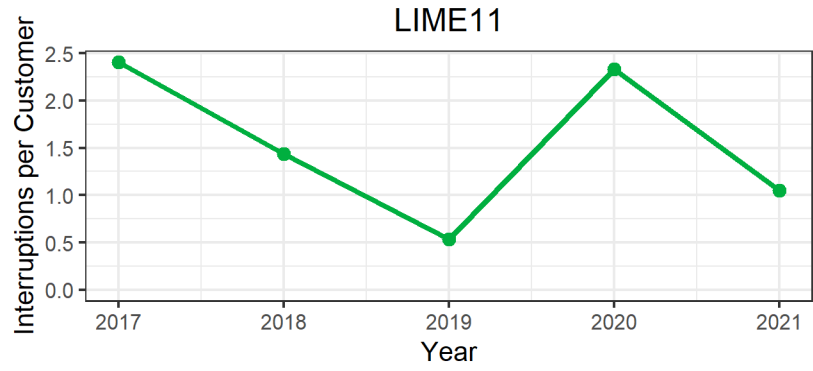
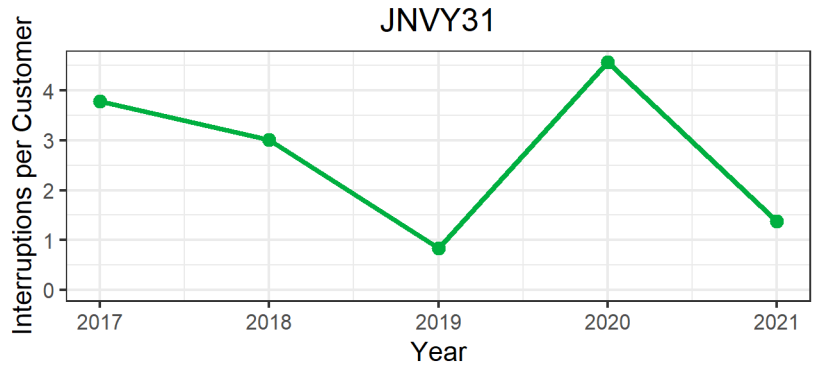


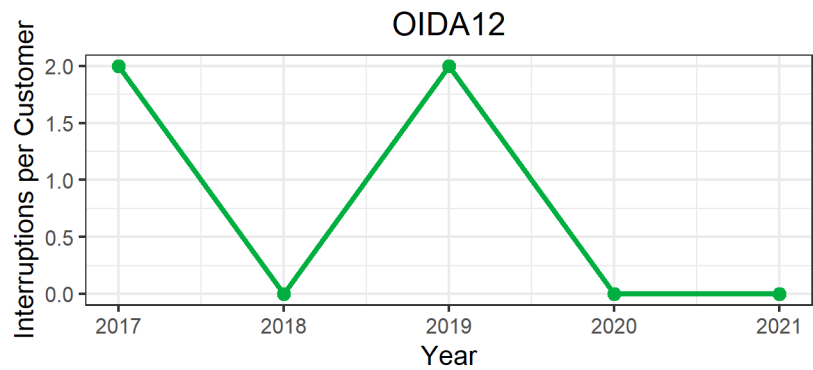
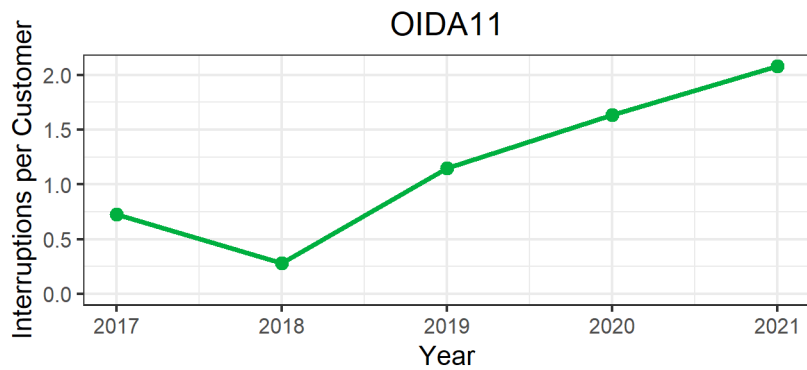
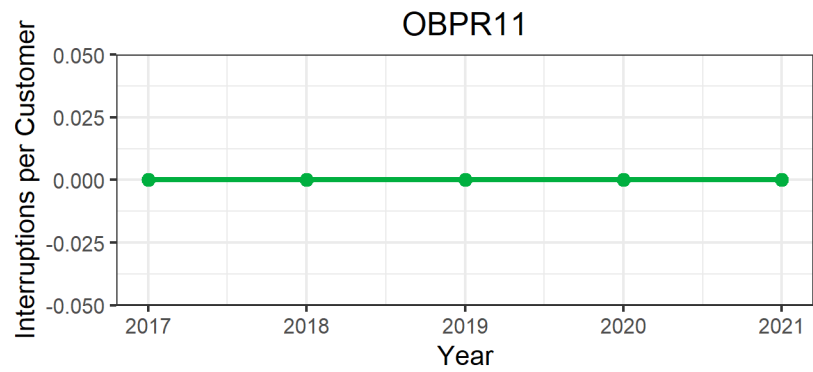
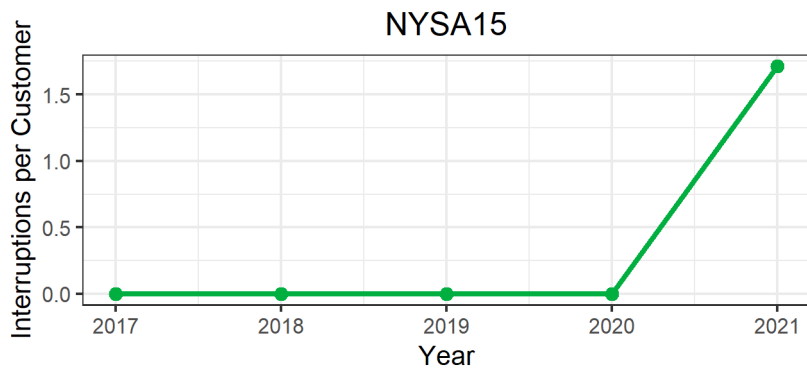
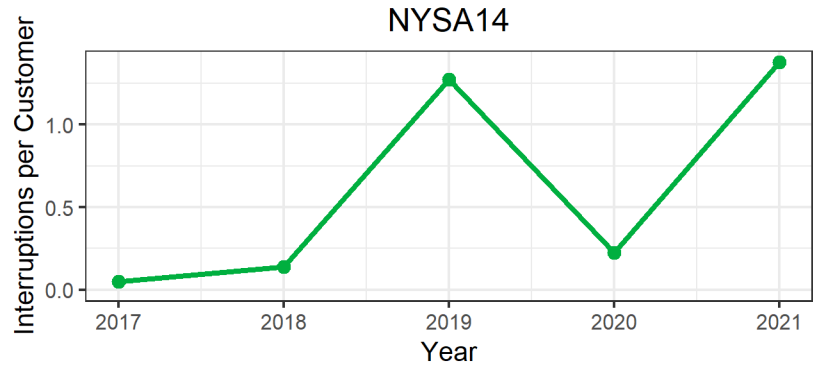
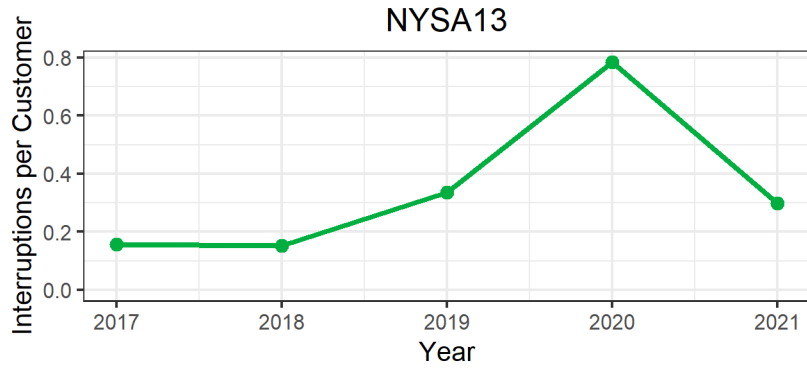




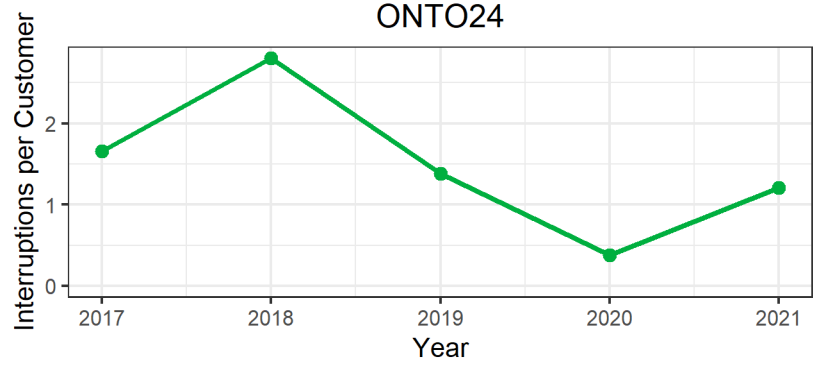
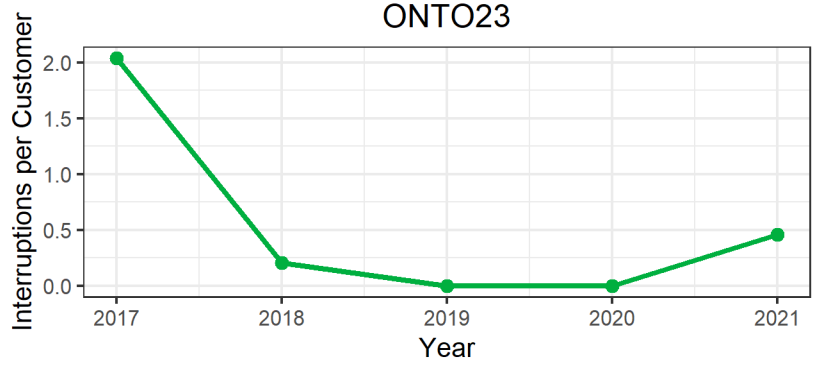
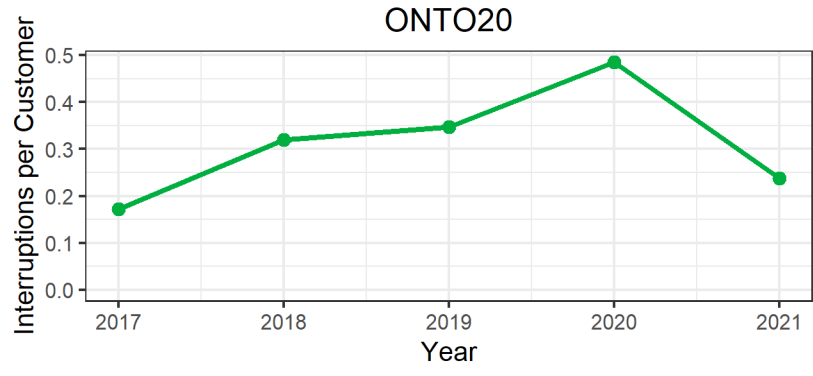
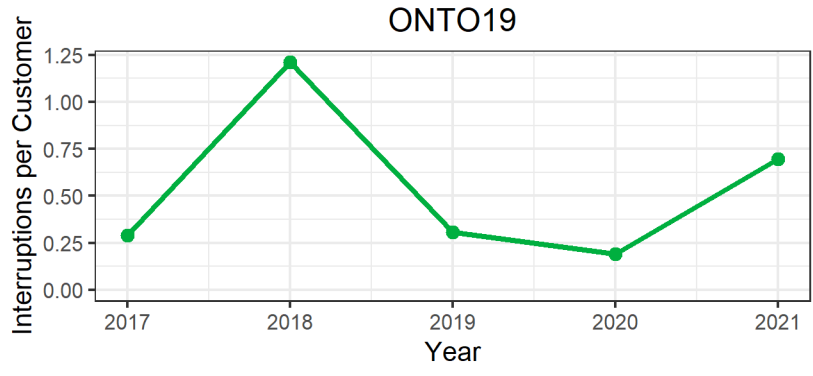
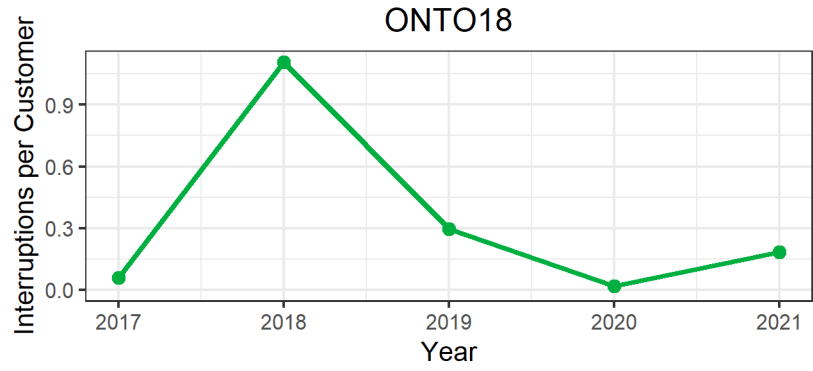
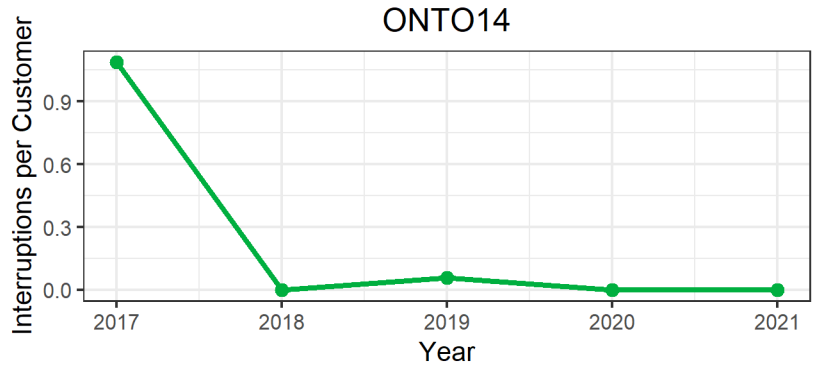


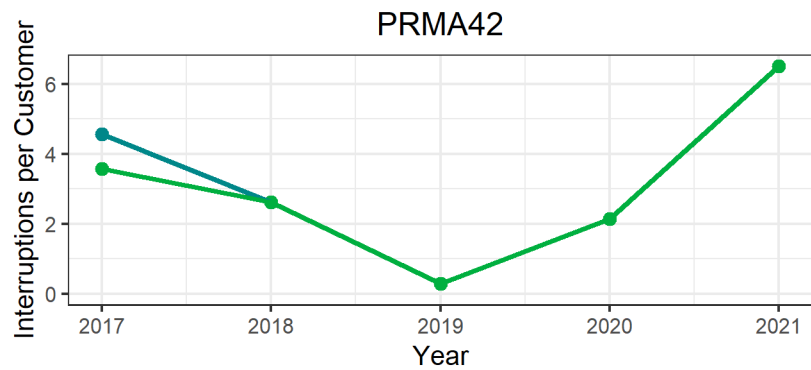
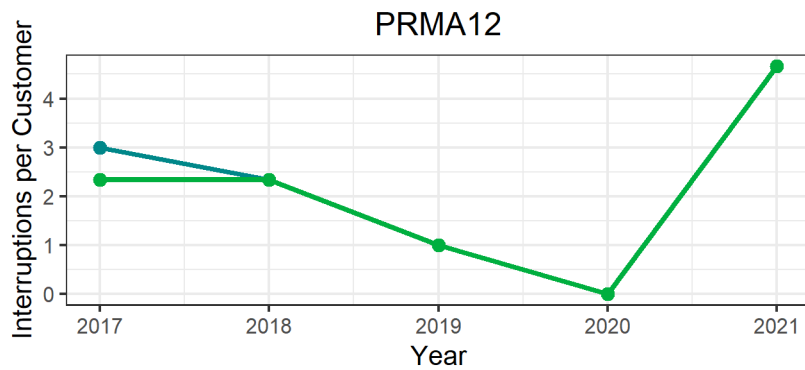
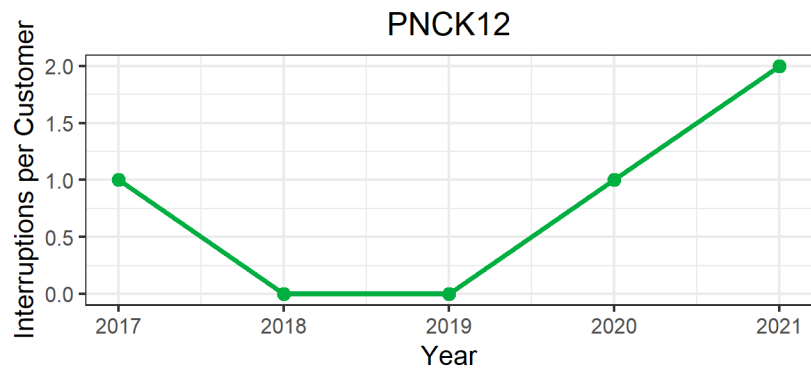
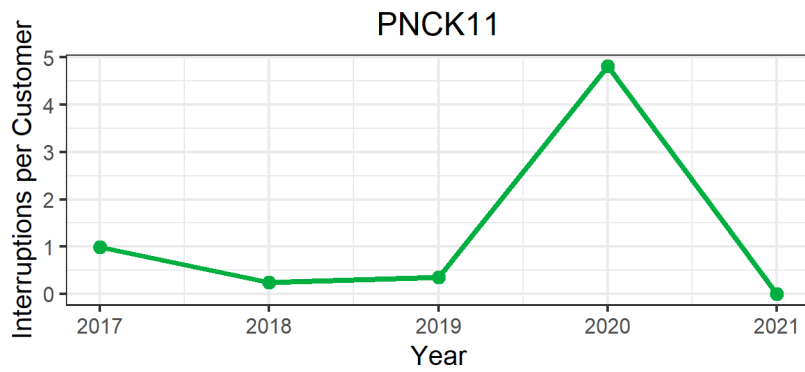
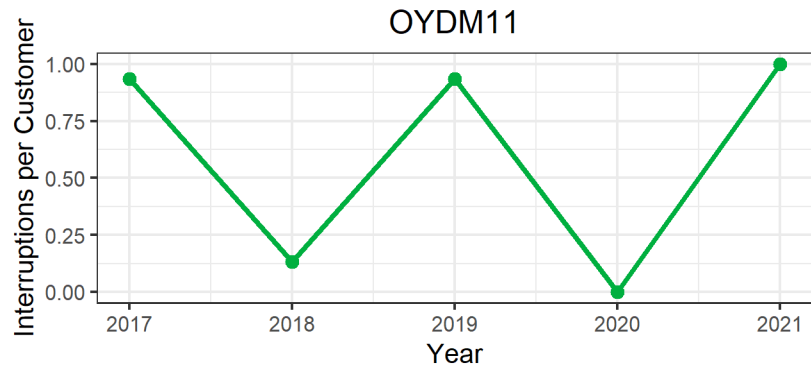
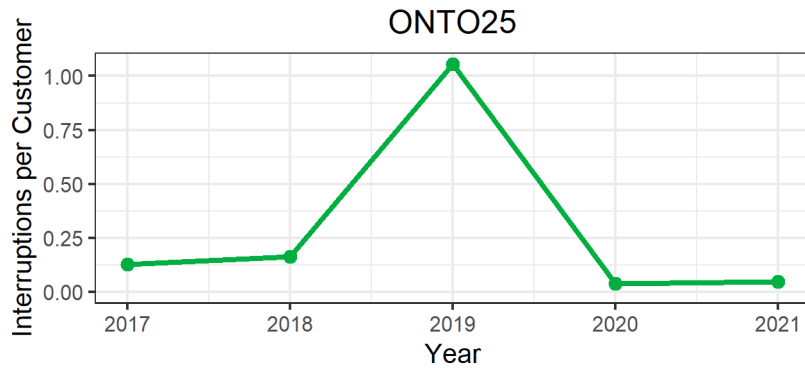


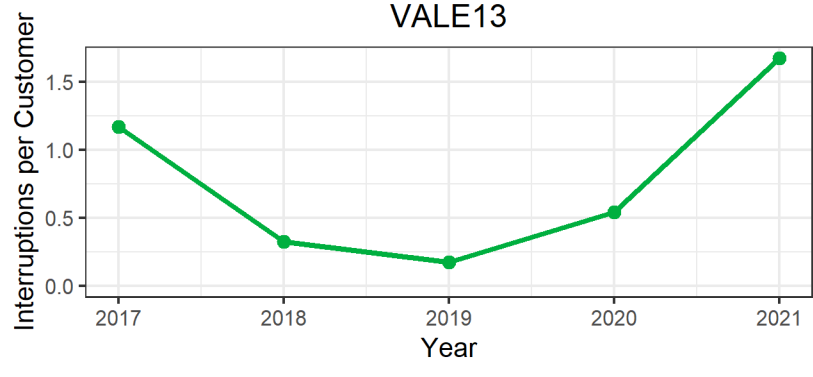
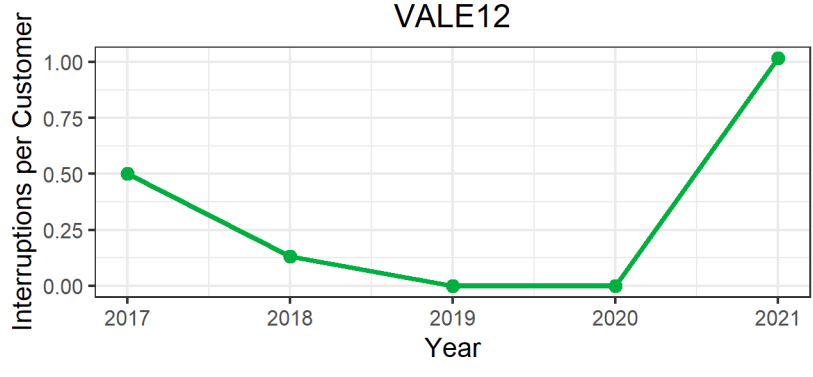
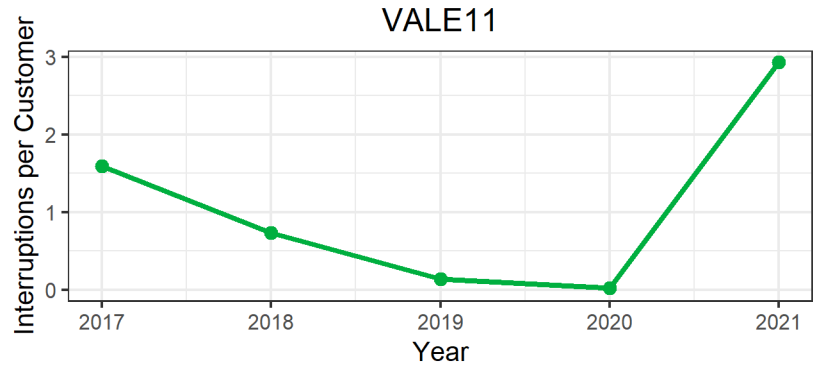
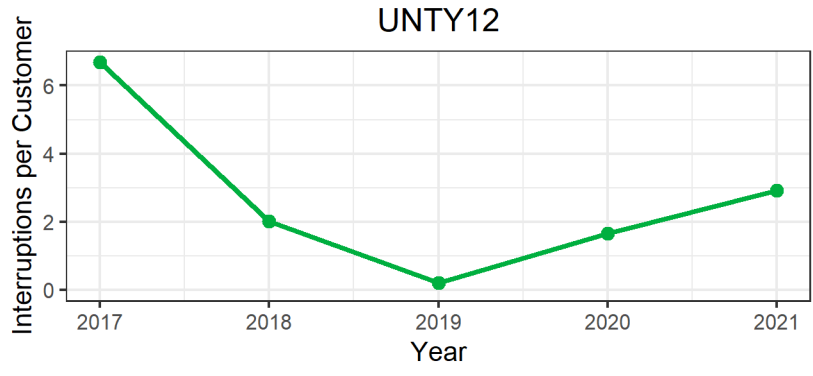
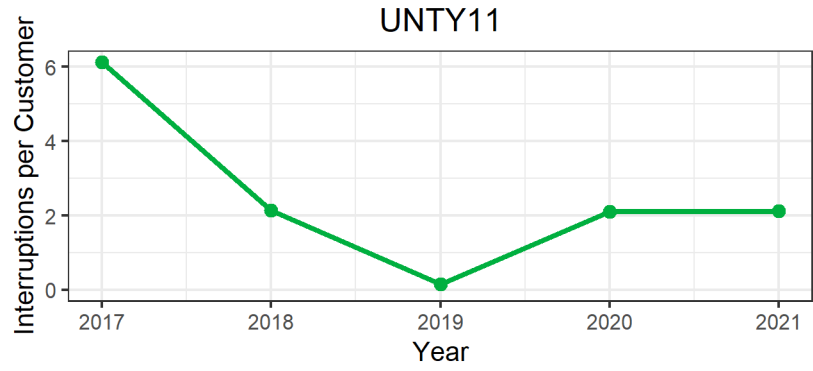
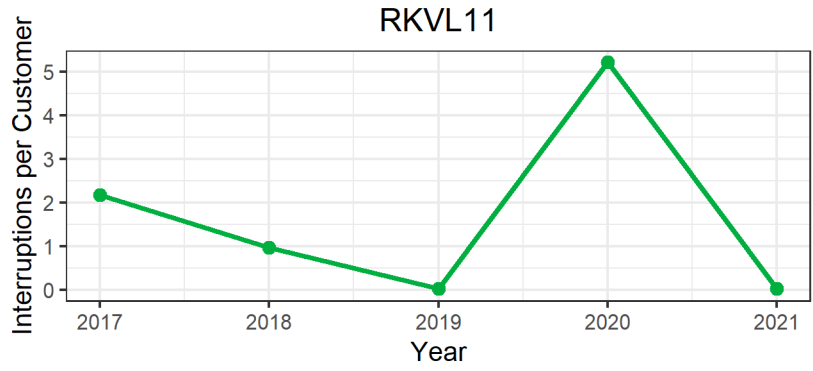












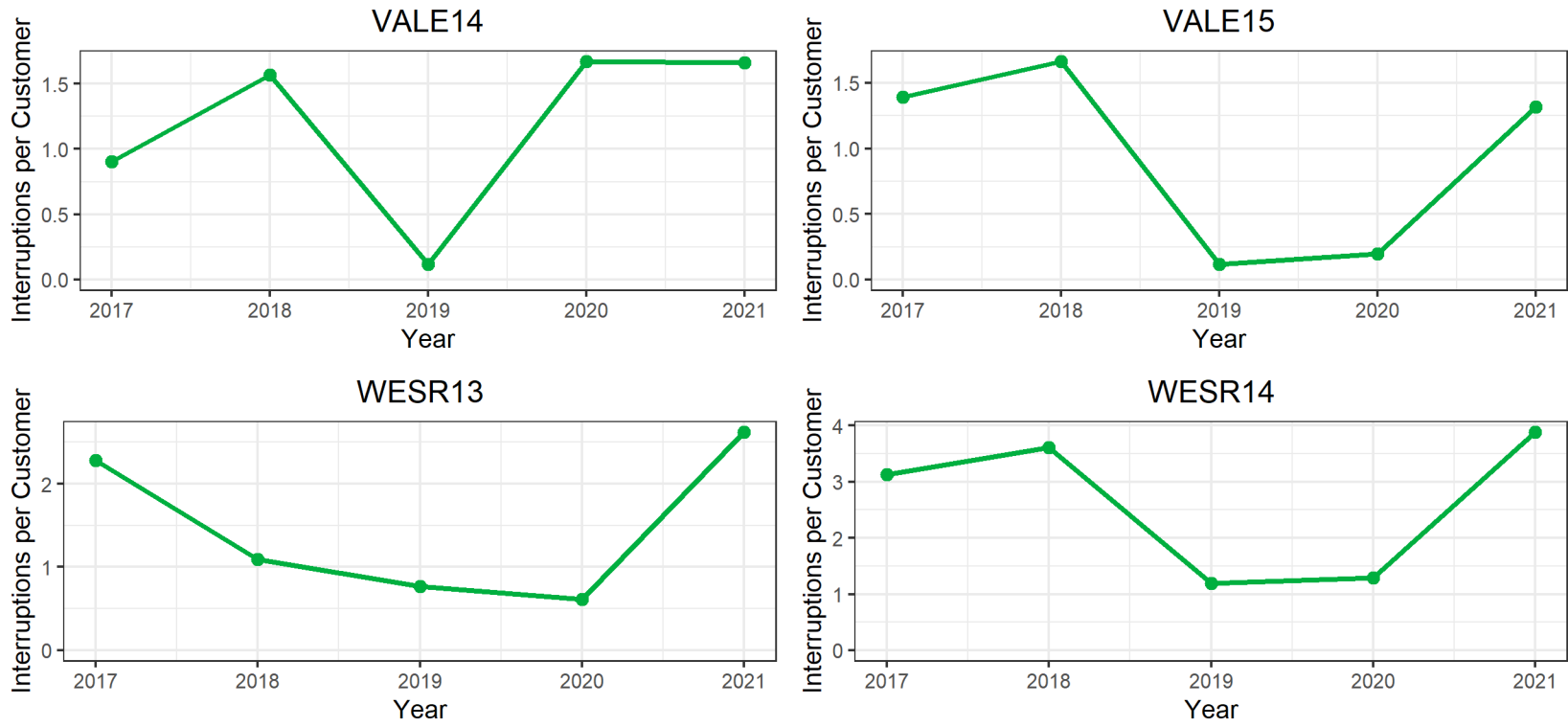
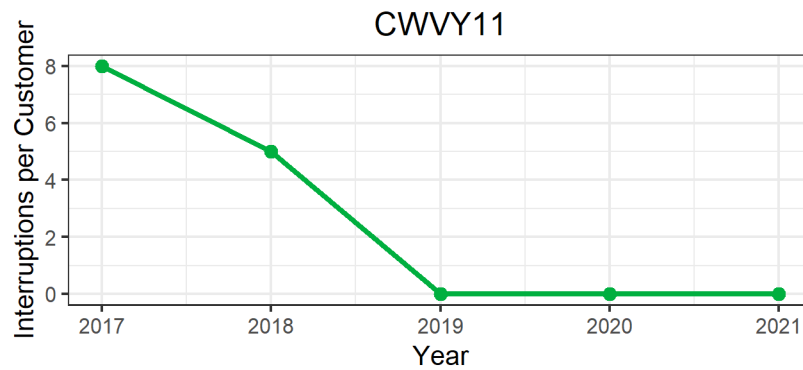
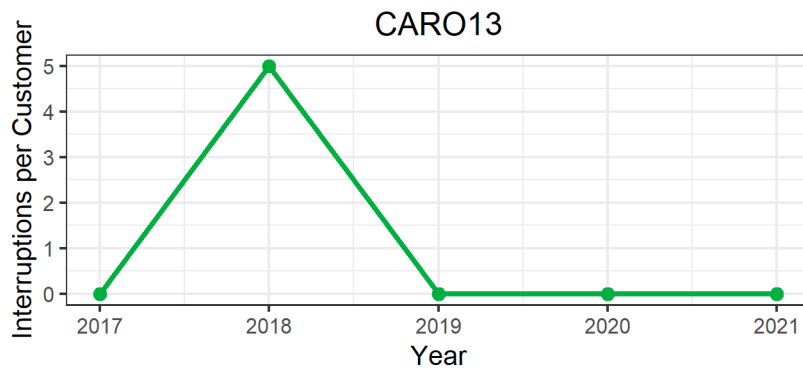
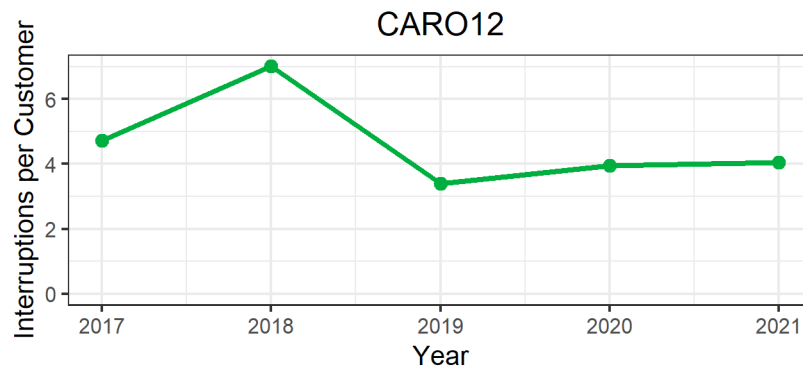
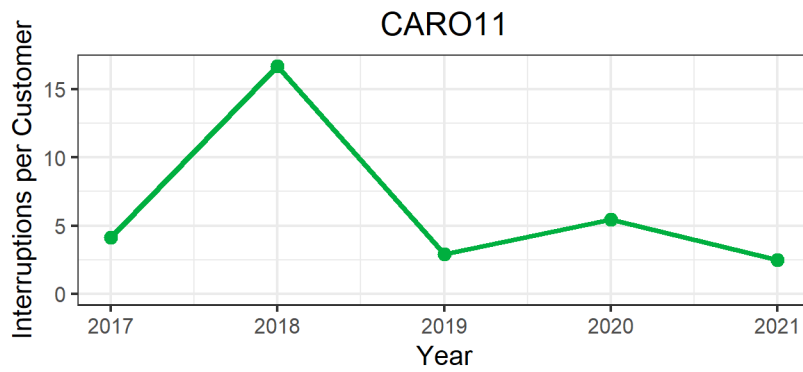
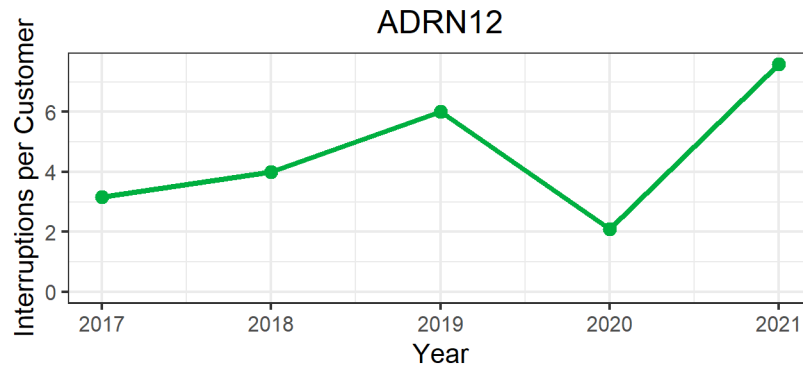
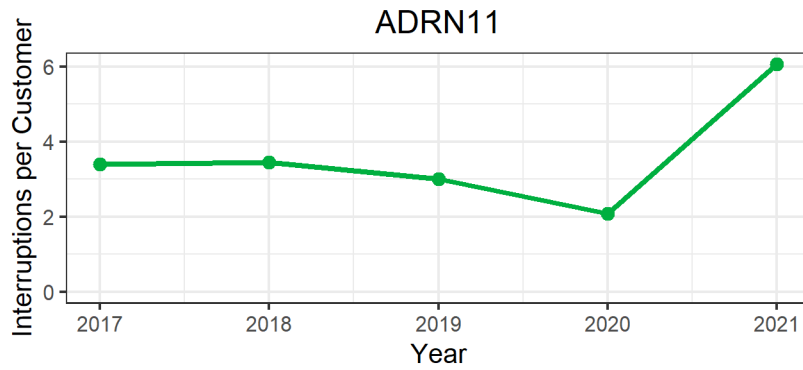


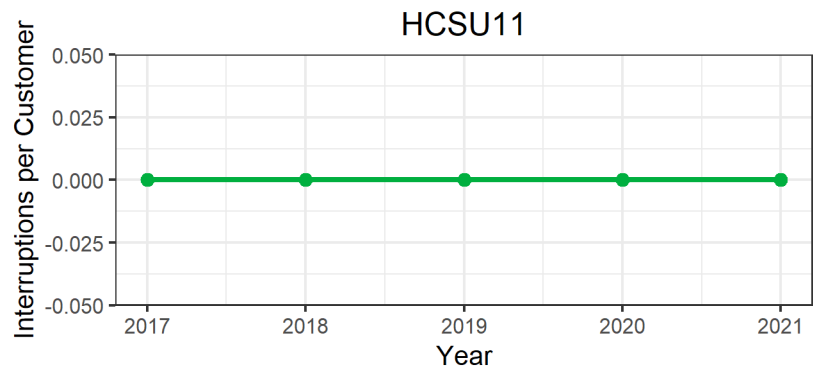
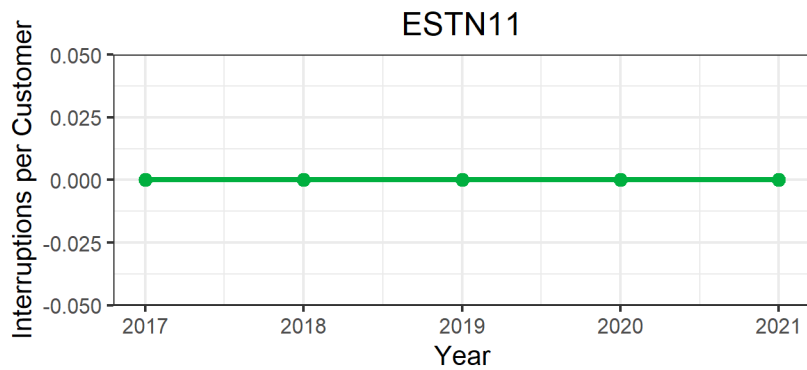
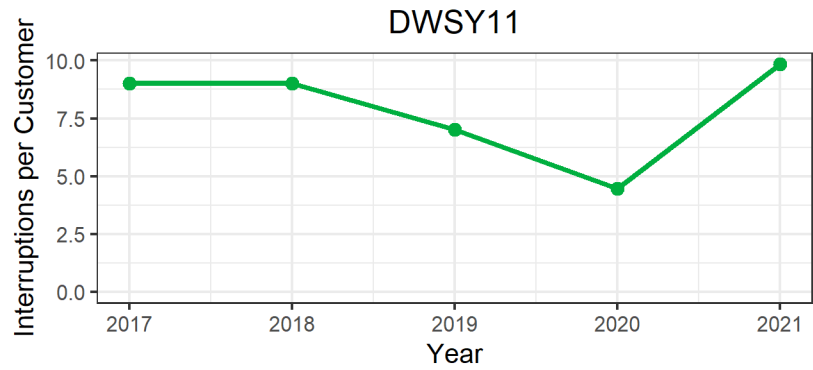
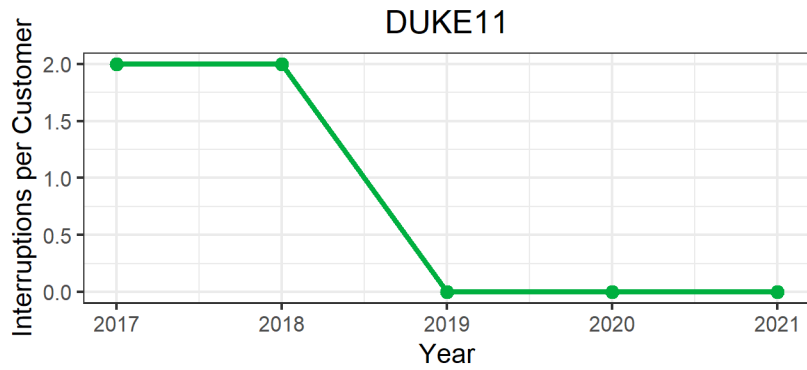
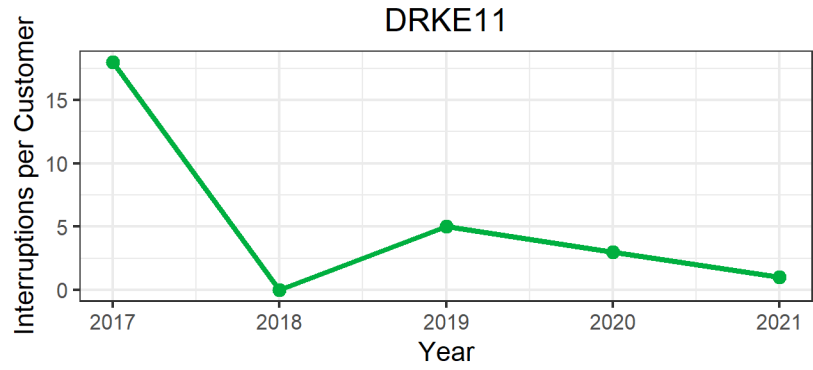
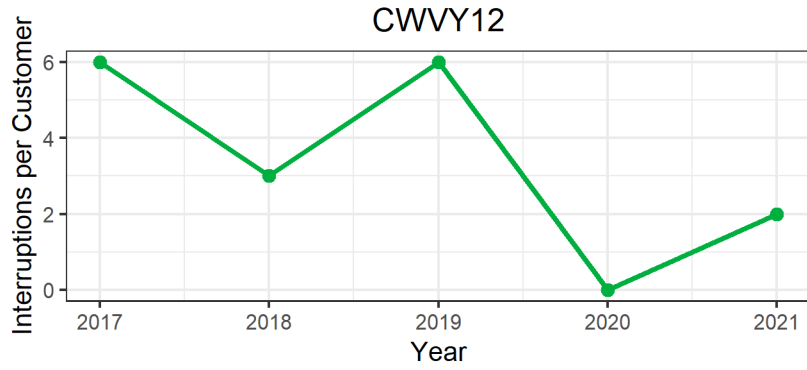
Figure 7 Five Years of Circuit SAIFI

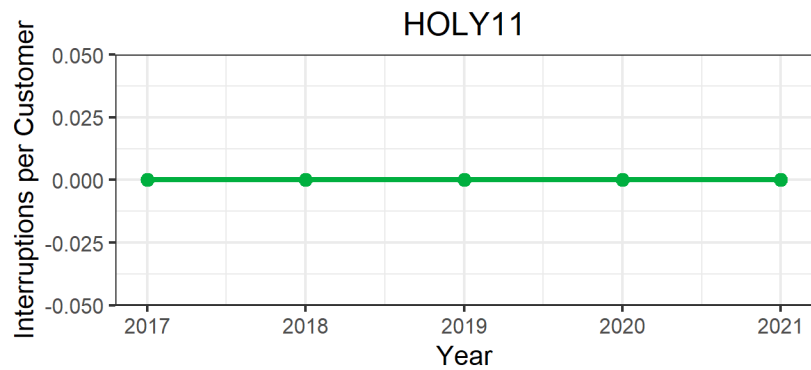
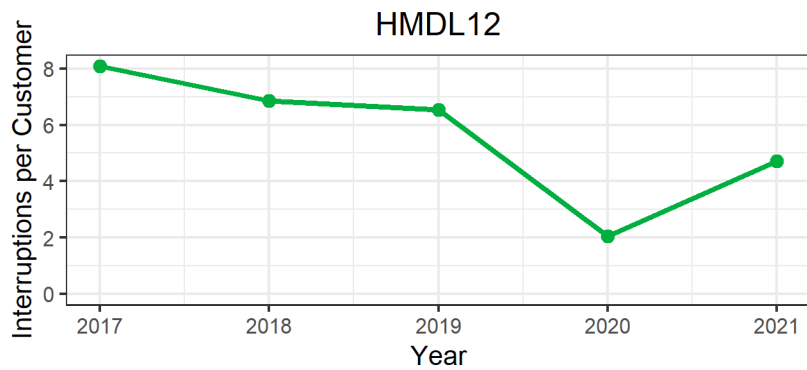
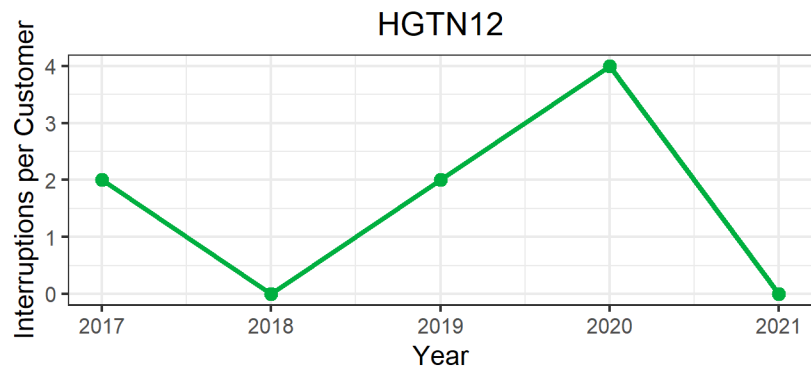
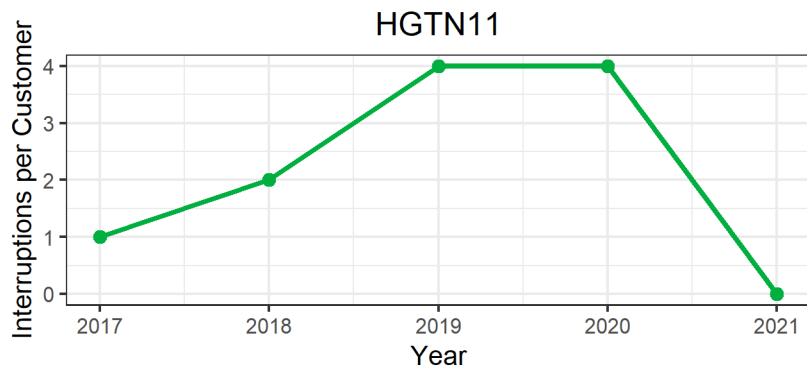
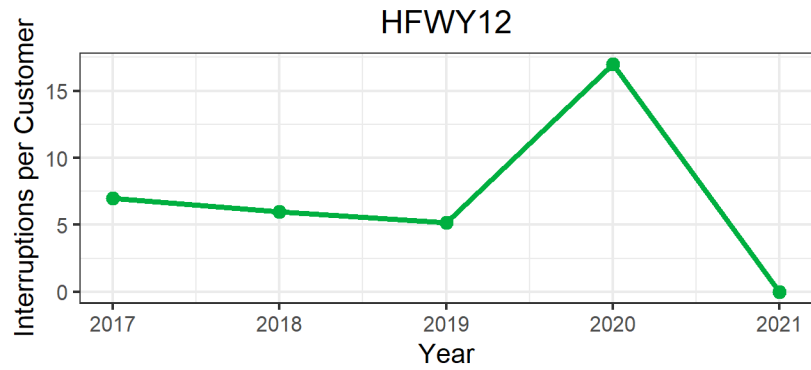
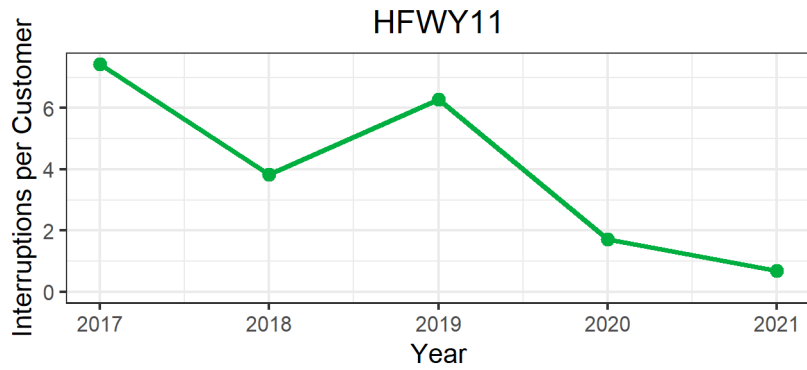
### Five Years of Circuit MAIFI<sub>E</sub>

Circuit	2017	2018	2019	2020	2021	2021 MedEx
ADRN11	3.84	3.50	3.00	2.09	6.07	6.07
ADRN12	6.55	13.20	6.00	2.09	7.59	7.59
CARO11	4.42	11.18	3.10	5.43	2.48	2.48
CARO12	4.66	7.04	3.38	3.95	4.05	4.05
CARO13	0.00	5.00	0.00	0.00	0.00	0.00
CWVY11	8.00	5.00	0.00	0.00	0.00	0.00
CWVY12	6.65	3.00	6.00	0.00	2.00	2.00
DRKE11	18.00	4.00	5.00	3.00	1.00	1.00
DUKE11	2.00	2.00	0.00	0.00	0.00	0.00
DWSY11	7.47	9.00	7.85	4.48	9.85	9.85
ESTN11	0.00	0.00	0.00	0.00	0.00	0.00
HCSU11	0.00	0.00	0.00	0.00	0.00	0.00
HFVY11	15.57	1.79	6.29	1.73	0.70	0.70
HFVY12	9.15	6.00	5.17	17.00	0.00	0.00
HGTN11	1.00	2.00	4.00	4.00	0.00	0.00
HGTN12	2.00	0.00	2.00	4.00	0.00	0.00
HMDL12	8.23	6.92	6.52	2.04	4.71	4.71
HOLY11	0.00	0.00	0.00	0.00	0.00	0.00
HOLY12	4.00	6.00	2.00	5.00	5.00	5.00
HOLY13	3.72	2.00	4.00	0.00	1.31	1.31
HOLY14	NA	NA	0.00	0.00	0.00	0.00
HOPE11	5.00	2.00	0.00	2.39	0.91	0.91
HRPR11	3.00	2.00	3.00	4.63	1.00	1.00
HRPR12	5.42	3.27	5.03	3.45	1.57	1.57
JMSN11	1.11	0.70	0.94	0.87	0.98	0.98
JMSN12	9.67	7.00	7.00	4.00	4.00	4.00
JNTA11	12.00	9.00	9.00	3.00	1.00	1.00
JNTA12	14.13	9.63	10.00	8.00	14.00	14.00
JNVY11	6.32	6.00	7.00	0.00	2.51	2.51
JNVY12	5.00	2.00	3.00	1.00	4.00	4.00
JNVY31	10.12	7.24	5.00	4.46	12.13	12.13
LIME11	2.19	2.00	2.00	0.60	0.13	0.13
MRBT41	1.00	1.00	1.00	3.00	5.00	5.00
MRBT42	0.00	1.00	1.00	2.00	6.00	6.00
NYSA11	0.00	2.00	1.00	2.00	0.00	0.00
NYSA12	7.15	1.95	0.00	0.00	3.00	3.00
NYSA13	1.26	1.09	1.00	0.52	3.47	3.47
NYSA14	1.35	0.00	1.00	0.00	3.51	3.51
NYSA15	0.00	0.00	0.00	0.00	0.00	0.00
OBPR11	0.00	0.00	0.00	0.00	0.00	0.00
OIDA11	2.00	0.00	0.00	3.00	0.00	0.00
OIDA12	0.00	0.00	0.00	0.00	0.00	0.00
ONTO14	1.00	1.00	1.00	0.00	0.00	0.00
ONTO18	2.00	3.00	4.00	3.00	1.00	1.00
ONTO19	0.00	1.72	1.72	1.34	1.28	1.28
ONTO20	0.00	0.00	2.00	1.00	0.00	0.00
ONTO23	7.00	0.00	0.00	0.00	1.00	1.00
ONTO24	3.28	0.00	0.00	0.68	0.00	0.00
ONTO25	3.00	0.00	0.00	0.00	1.00	1.00
OYDM11	0.00	0.00	0.00	0.00	0.00	0.00
PNCK11	4.00	4.00	4.00	5.00	0.00	0.00
PNCK12	0.00	0.00	0.00	0.00	0.00	0.00
PRMA12	5.00	1.00	0.00	0.00	0.00	0.00
PRMA42	12.23	9.74	6.24	3.15	4.47	4.47
RKVL11	6.00	5.00	6.00	3.00	4.00	4.00
UNTY11	15.00	8.00	7.00	8.05	4.00	4.00
UNTY12	14.85	0.00	0.00	0.00	0.00	0.00
VALE11	4.55	2.86	1.00	1.00	0.39	0.39
VALE12	0.00	0.00	0.00	0.00	0.00	0.00
VALE13	3.73	0.00	0.91	2.89	3.35	3.35
VALE14	2.61	2.00	0.00	0.12	2.00	2.00
VALE15	2.76	2.25	0.00	5.00	0.46	0.46
WESR13	0.27	0.74	4.26	1.26	3.00	3.00
WESR14	2.90	6.00	3.00	2.00	0.86	0.86

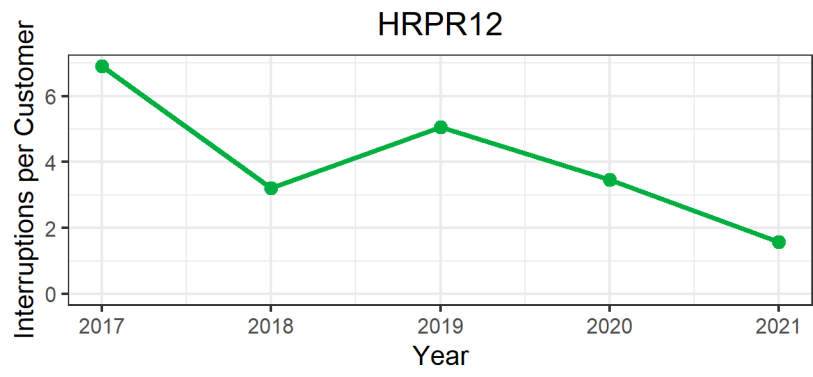
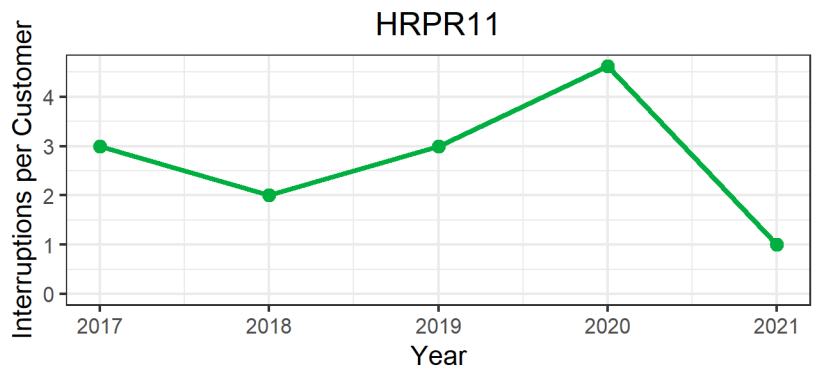
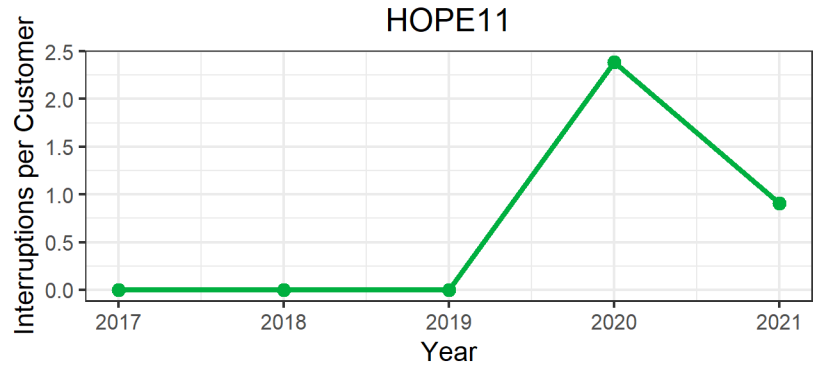
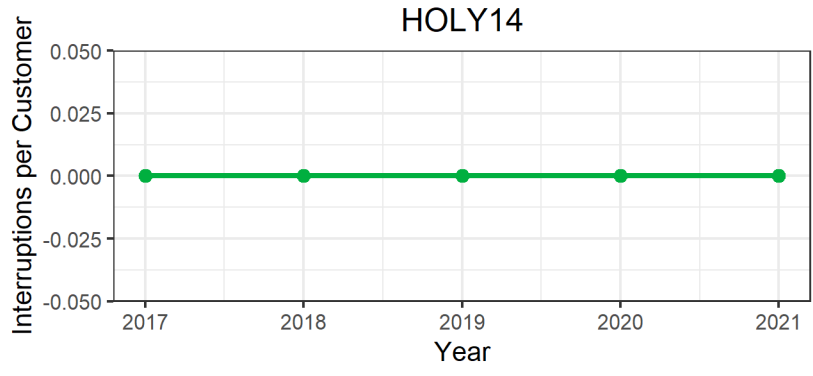
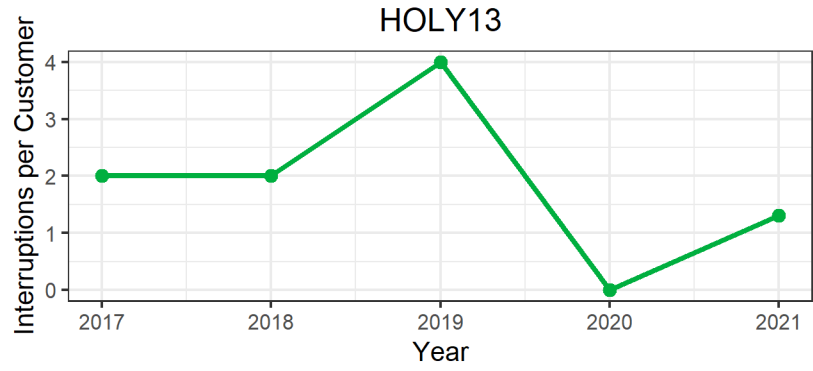
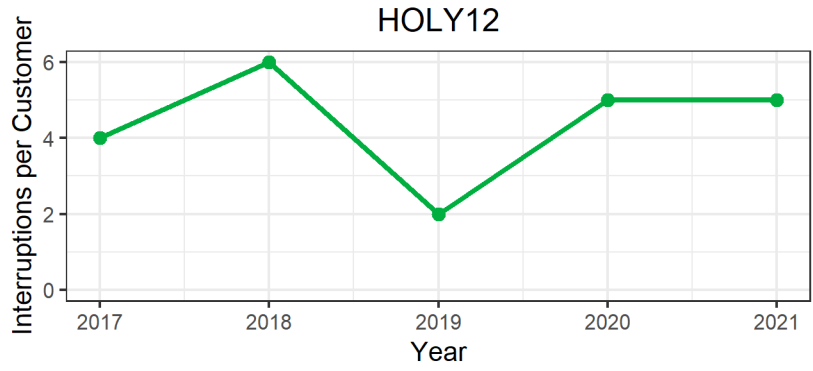
Table 8 Five Years of Circuit MAIFI<sub>E</sub>

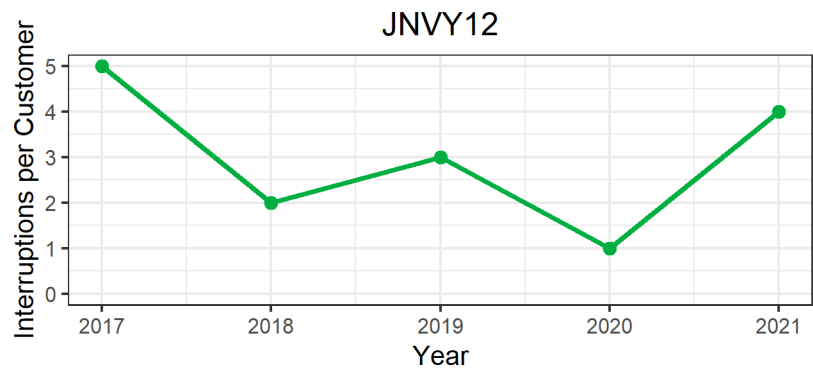
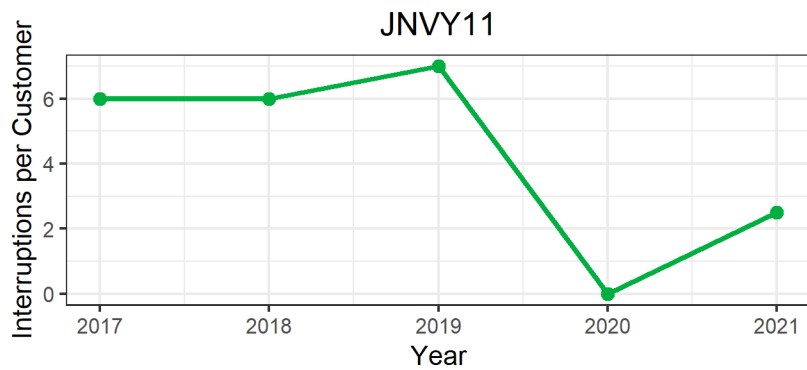
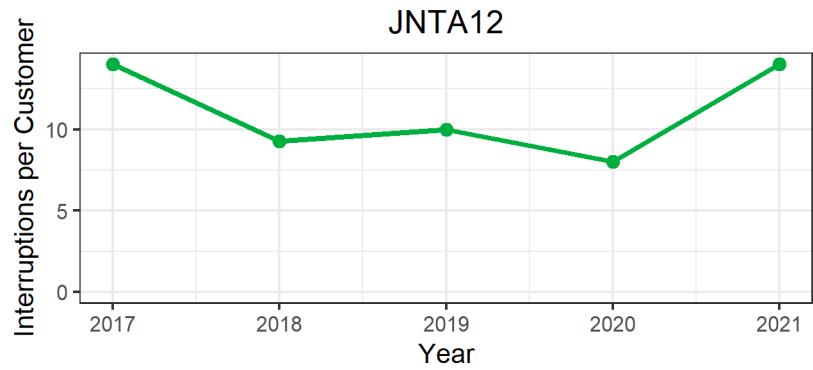
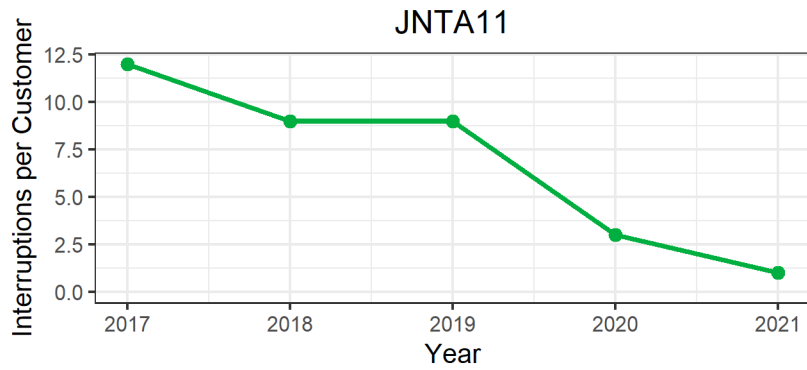
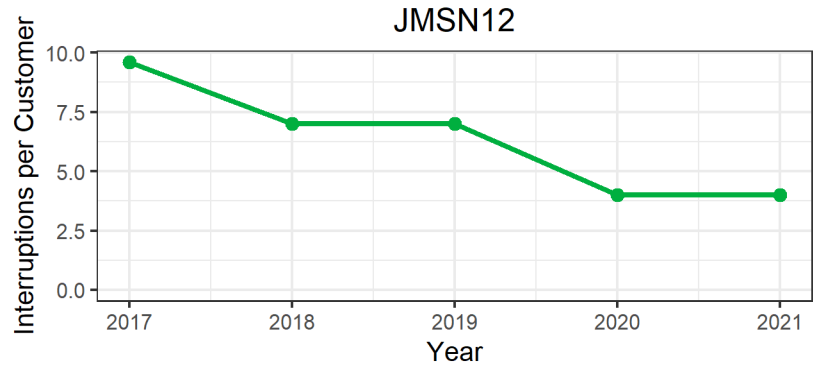
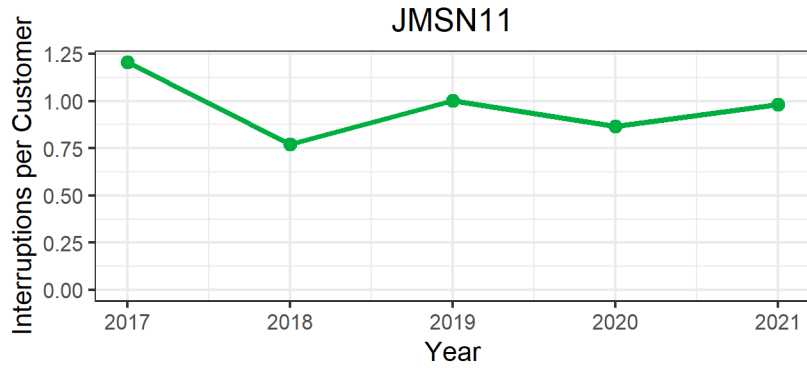


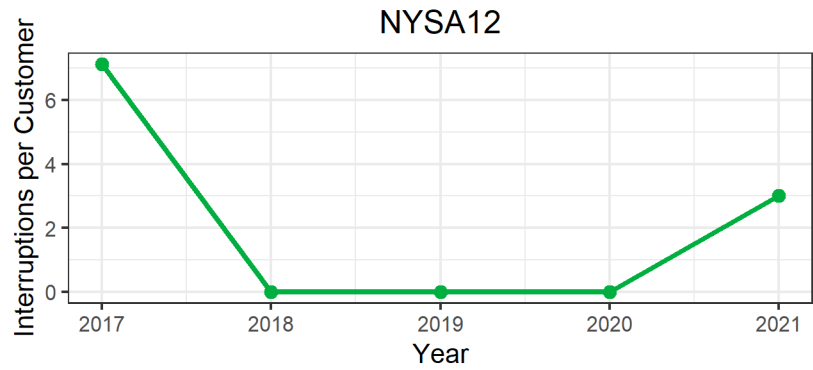
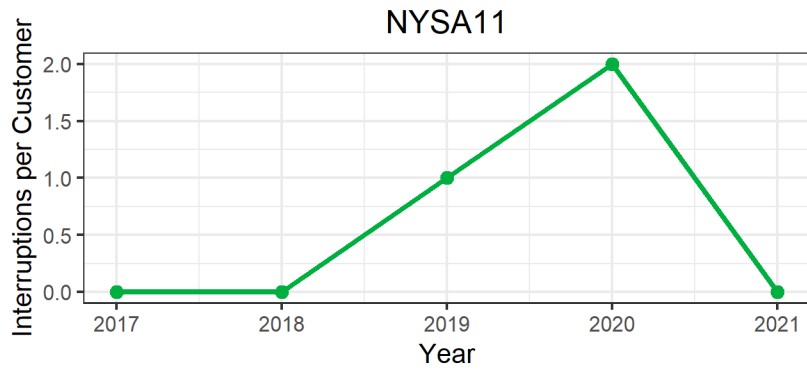
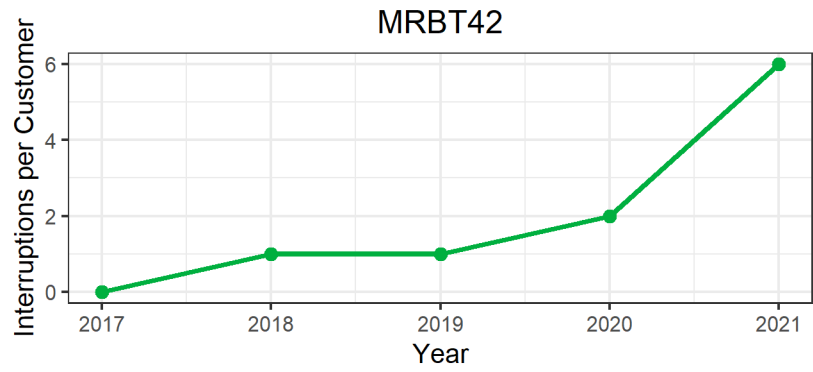
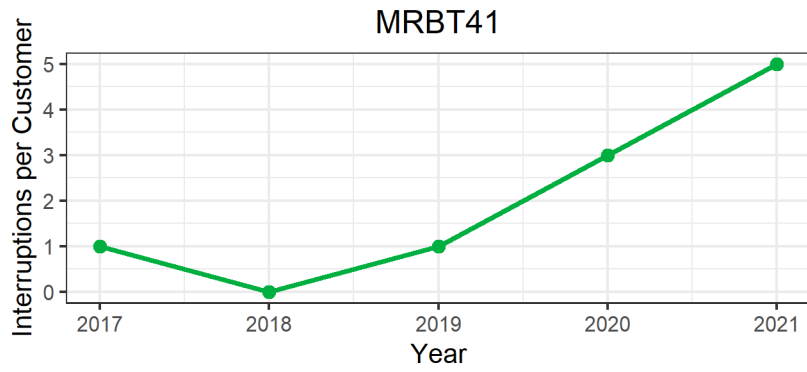
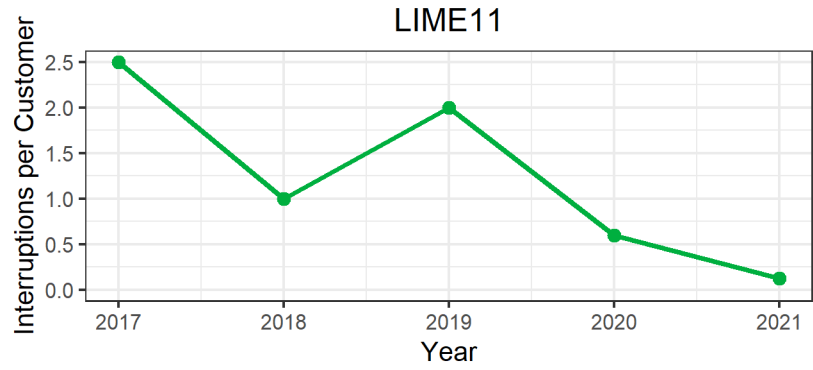
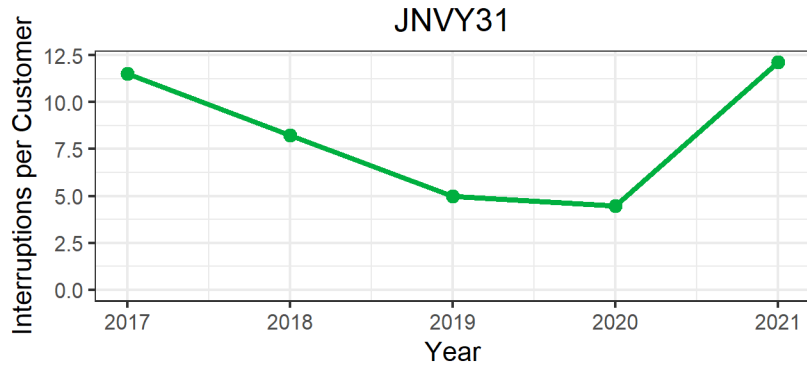


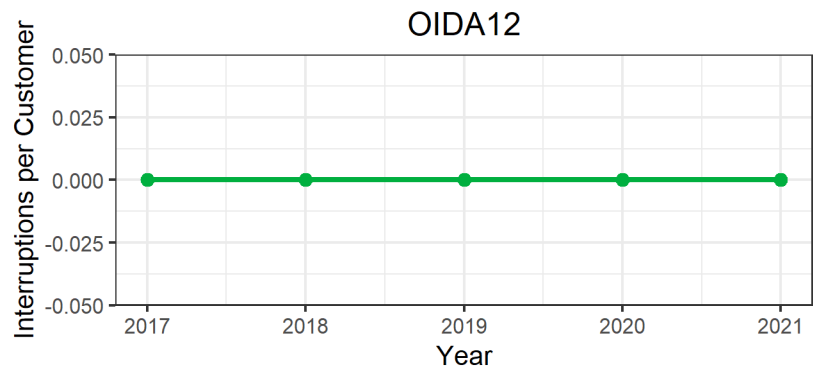
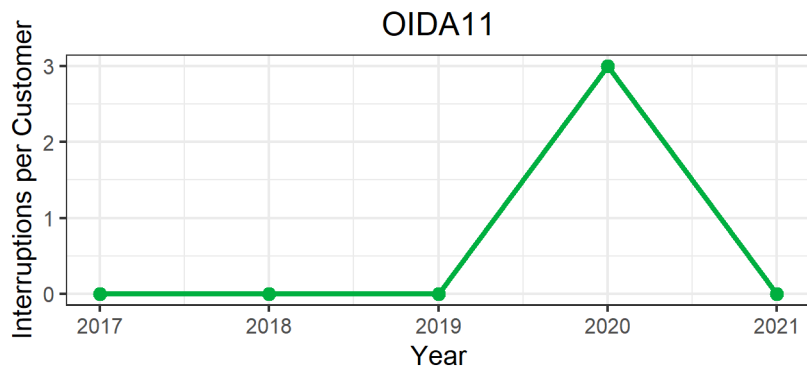
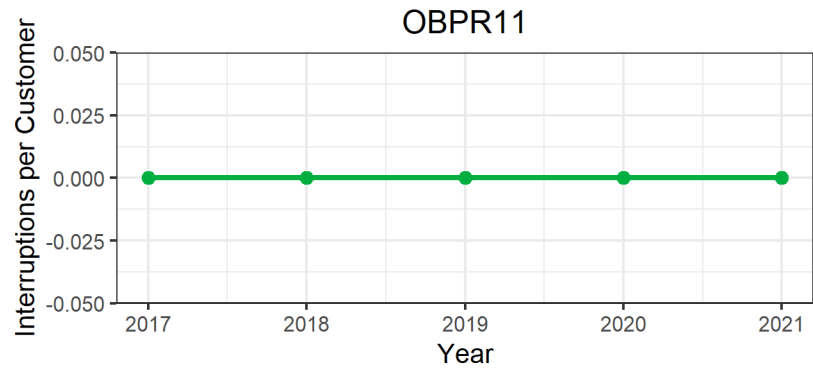
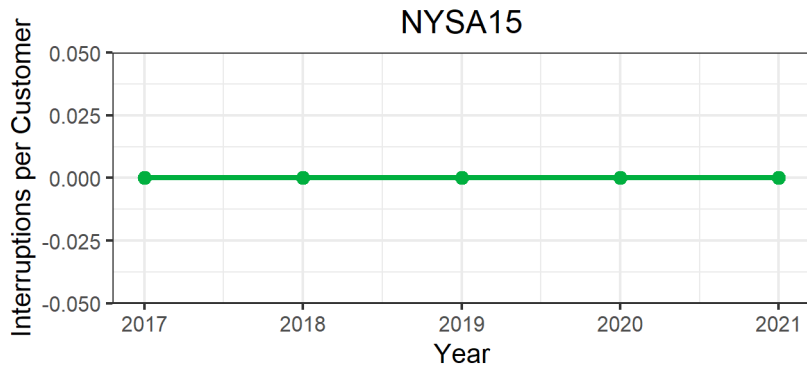
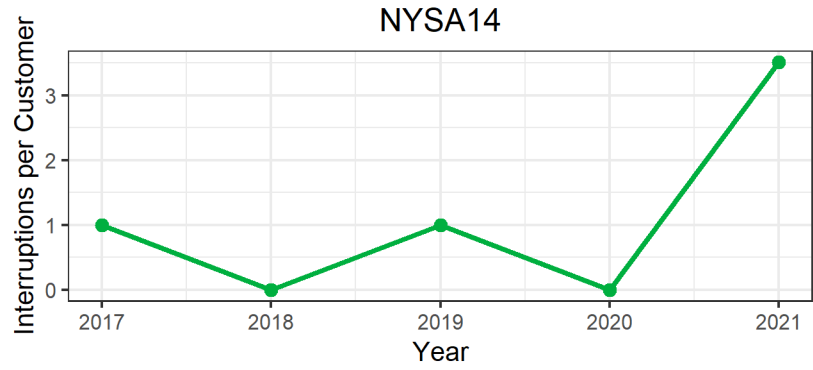
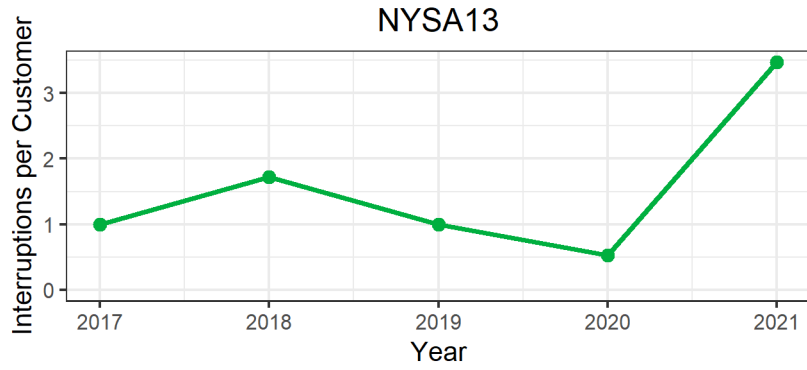


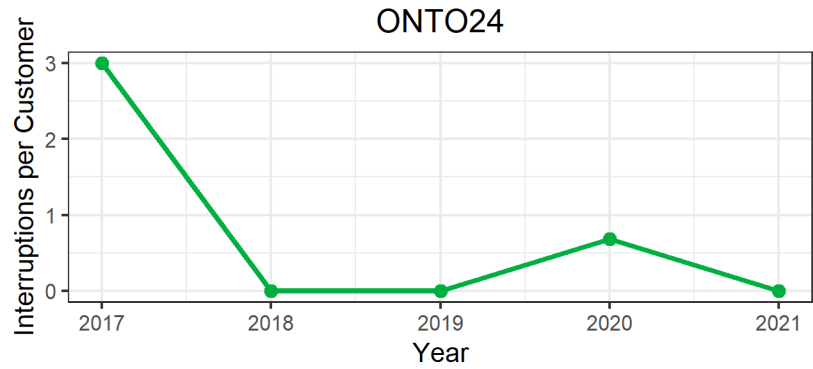
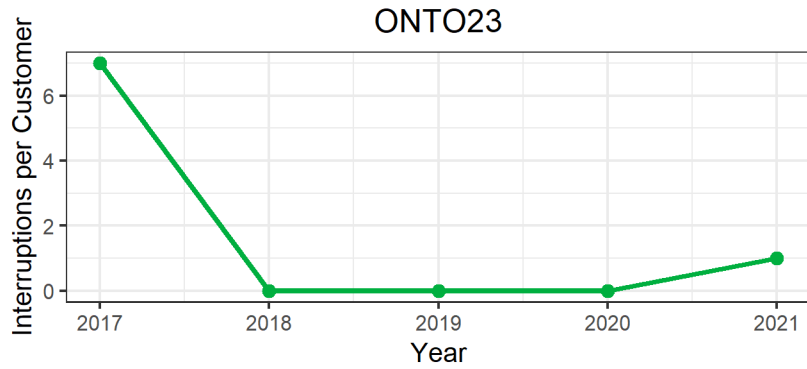
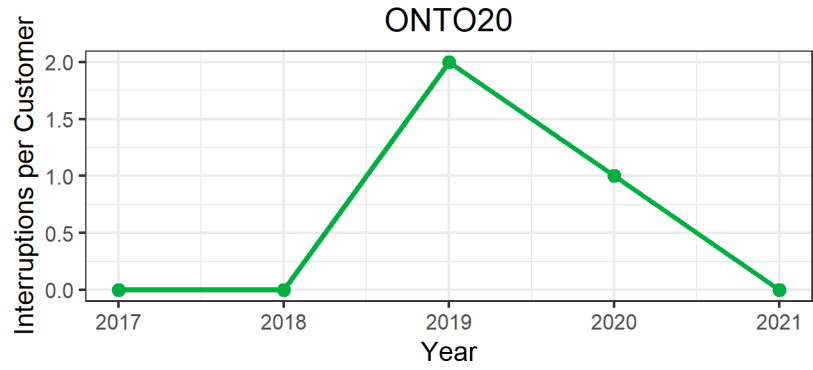
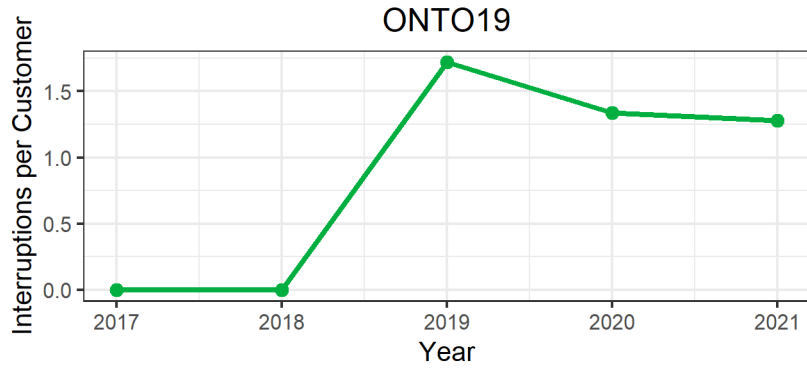
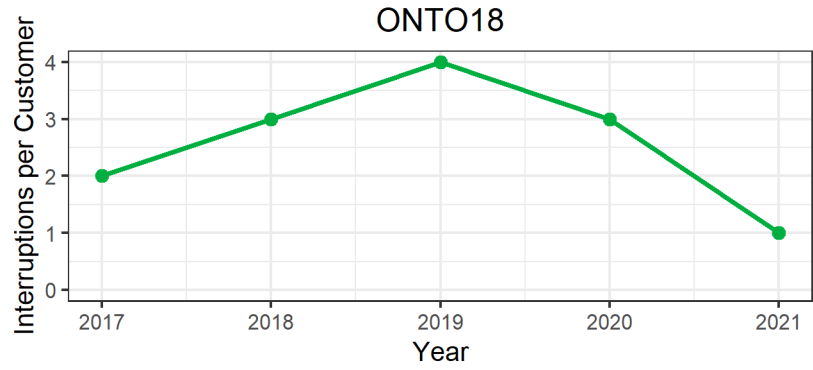
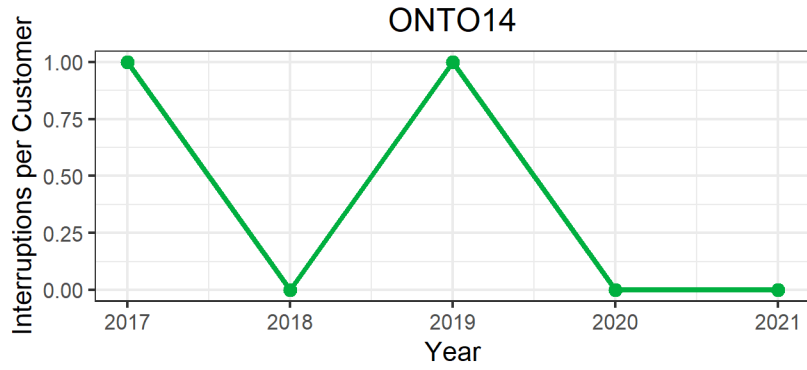


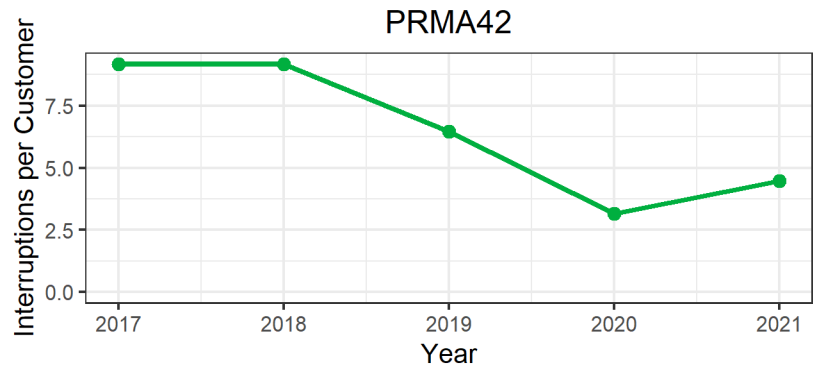
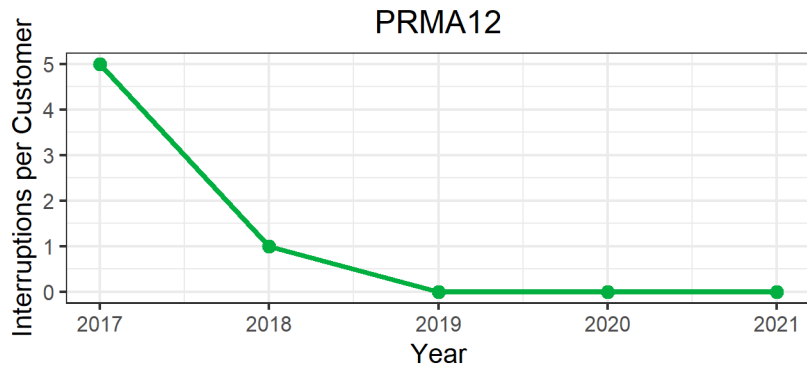
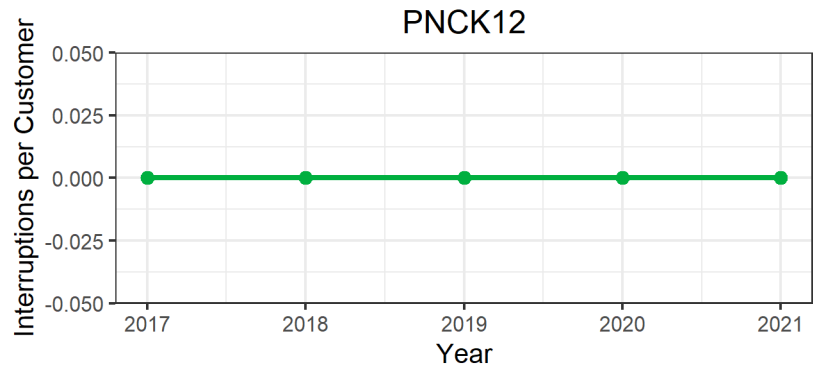
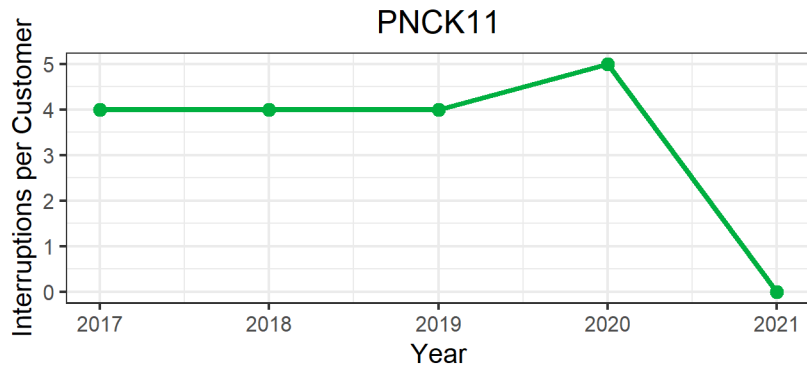
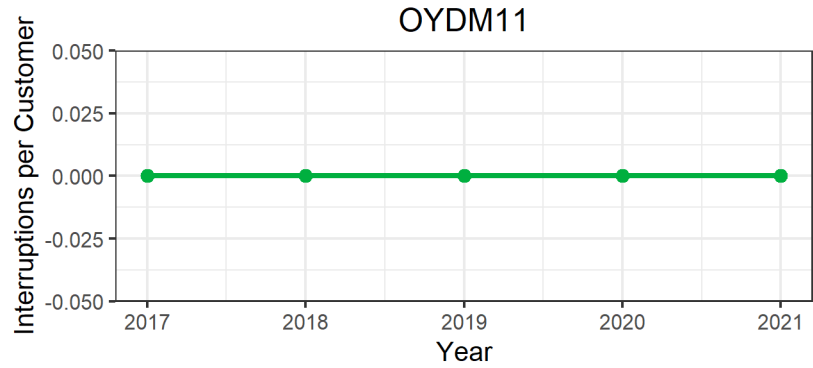
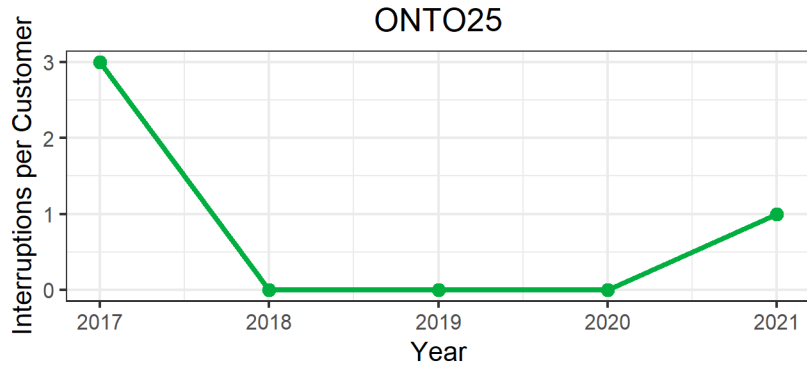


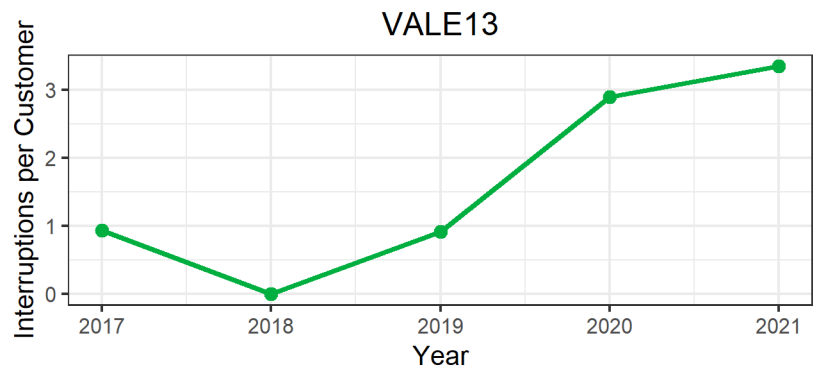
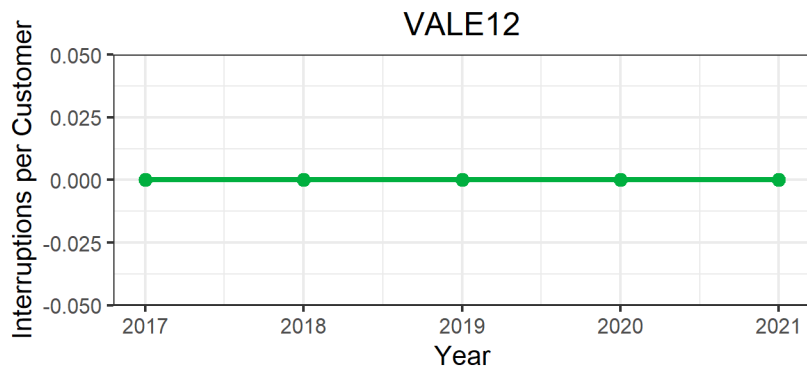
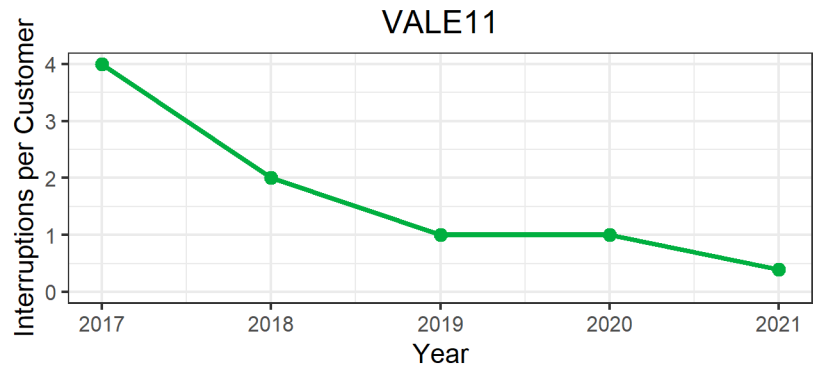
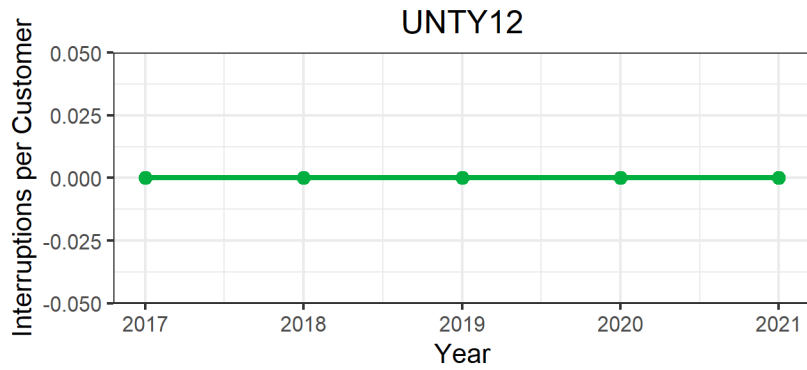
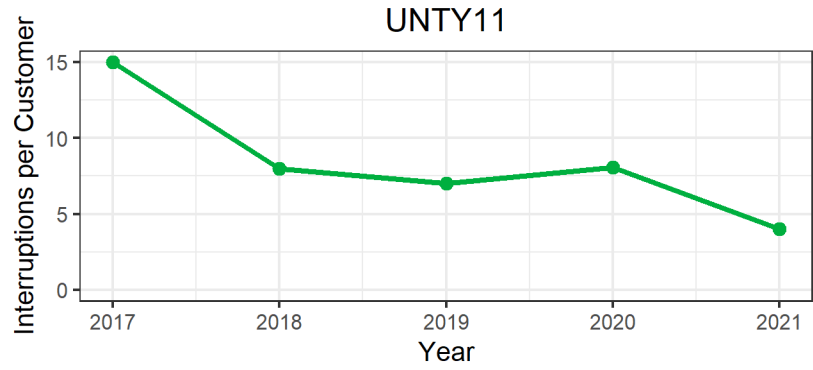
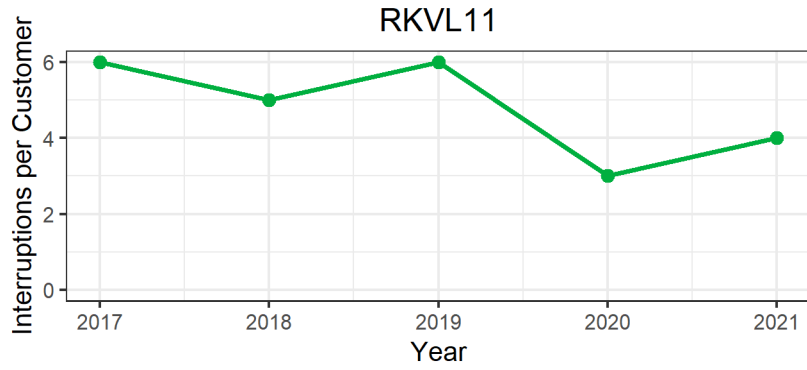












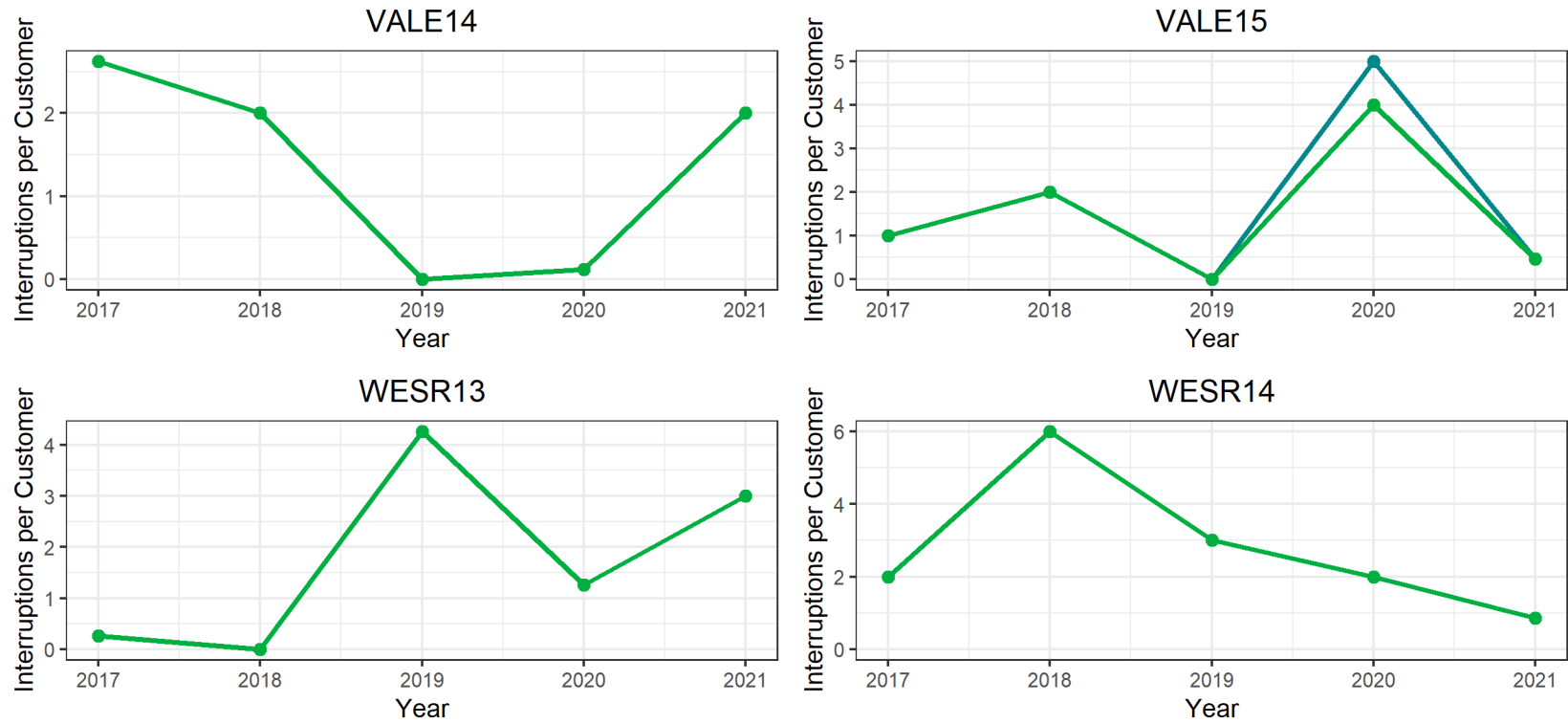


Figure 8 Five Years of Circuit MAIFI<sub>E</sub>



## 2021 Descending Indices by Circuit

Circuit	SAIDI	SAIDI MedEx	Circuit	SAIFI	SAIFI MedEx	Circuit	MAIFI <sub>E</sub>	MAIFI <sub>E</sub> MedEx
NYSA15	329.78	329.78	ESTN11	7.00	7.00	JNTA12	14.00	14.00
ESTN11	36.14	36.14	PRMA42	6.51	6.51	JNVY31	12.13	12.13
JNTA12	34.56	34.56	HRPR12	5.86	5.86	DWSY11	9.85	9.85
HRPR12	25.32	25.32	HRPR11	5.18	5.18	ADRN12	7.59	7.59
JNTA11	20.88	20.88	PRMA12	4.67	4.67	ADRN11	6.07	6.07
DWSY11	20.21	20.21	JNTA12	4.09	4.09	MRBT42	6.00	6.00
HRPR11	15.33	15.33	WESR14	3.89	3.89	MRBT41	5.00	5.00
JNVY31	13.73	13.73	HOPE11	3.75	3.75	HOLY12	5.00	5.00
PNCK12	12.97	12.97	CWVY12	3.73	3.73	HMDL12	4.71	4.71
PRMA42	12.50	12.50	CARO13	3.14	3.14	PRMA42	4.47	4.47
WESR14	8.70	8.70	DWSY11	3.14	3.14	CARO12	4.05	4.05
CWVY12	8.55	8.55	JNTA11	3.05	3.05	JNVY12	4.00	4.00
DUKE11	8.18	8.18	DUKE11	3.00	3.00	JMSN12	4.00	4.00
UNTY12	7.66	7.66	VALE11	2.94	2.94	RKVL11	4.00	4.00
PRMA12	6.61	6.61	UNTY12	2.92	2.92	UNTY11	4.00	4.00
HOPE11	6.46	6.46	ADRN12	2.90	2.90	NYSA14	3.51	3.51
MRBT42	6.29	6.29	WESR13	2.62	2.62	NYSA13	3.47	3.47
ADRN12	6.21	6.21	ADRN11	2.49	2.49	VALE13	3.35	3.35
MRBT41	5.28	5.28	NYSA12	2.39	2.39	WESR13	3.00	3.00
WESR13	5.26	5.26	JMSN12	2.29	2.29	NYSA12	3.00	3.00
HMDL12	5.10	5.10	JMSN11	2.24	2.24	JNVY11	2.51	2.51
CARO13	4.71	4.71	HMDL12	2.12	2.12	CARO11	2.48	2.48
JMSN12	4.34	4.34	UNTY11	2.12	2.12	CWVY12	2.00	2.00
VALE11	4.10	4.10	OIDA11	2.08	2.08	VALE14	2.00	2.00
ADRN11	3.93	3.93	CWVY11	2.05	2.05	HRPR12	1.57	1.57
OYDM11	3.87	3.87	PNCK12	2.00	2.00	HOLY13	1.31	1.31
CARO11	3.78	3.78	NYSA15	1.85	1.85	ONTO19	1.28	1.28
NYSA12	3.49	3.49	VALE13	1.67	1.67	ONTO18	1.00	1.00
VALE13	3.15	3.15	VALE14	1.66	1.66	ONTO25	1.00	1.00
OIDA11	3.05	3.05	CARO11	1.38	1.38	ONTO23	1.00	1.00
LIME11	2.92	2.92	JNVY31	1.38	1.38	DRKE11	1.00	1.00
JNVY12	2.64	2.64	NYSA14	1.38	1.38	JNTA11	1.00	1.00
HFVY11	2.58	2.58	VALE15	1.32	1.32	HRPR11	1.00	1.00
ONTO19	2.52	2.52	MRBT42	1.27	1.27	JMSN11	0.98	0.98
CARO12	2.42	2.42	ONTO24	1.21	1.21	HOPE11	0.91	0.91
UNTY11	2.37	2.37	MRBT41	1.09	1.09	WESR14	0.86	0.86
DRKE11	2.35	2.35	CARO12	1.07	1.07	HFVY11	0.70	0.70
NYSA14	2.14	2.14	LIME11	1.05	1.05	VALE15	0.46	0.46
JMSN11	2.09	2.09	VALE12	1.02	1.02	VALE11	0.39	0.39
CWVY11	1.96	1.96	OYDM11	1.00	1.00	LIME11	0.13	0.13
ONTO24	1.94	1.94	JNVY12	1.00	1.00	NYSA11	0.00	0.00
VALE14	1.68	1.68	HFVY12	0.85	0.85	HFVY12	0.00	0.00
NYSA11	1.42	1.42	NYSA11	0.76	0.76	HGTN11	0.00	0.00
HOLY13	1.35	1.35	ONTO19	0.70	0.70	HGTN12	0.00	0.00
ONTO23	1.23	1.23	HOLY13	0.59	0.59	HOLY14	0.00	0.00
VALE15	1.18	1.18	DRKE11	0.52	0.52	HOLY11	0.00	0.00
HGTN11	1.06	1.06	HFVY11	0.52	0.52	DUKE11	0.00	0.00
HFVY12	0.86	0.86	ONTO23	0.46	0.46	ESTN11	0.00	0.00
HOLY11	0.85	0.85	HGTN11	0.40	0.40	HCSU11	0.00	0.00
NYSA13	0.72	0.72	HOLY11	0.39	0.39	CARO13	0.00	0.00
VALE12	0.70	0.70	NYSA13	0.30	0.30	CWVY11	0.00	0.00
HOLY12	0.64	0.64	ONTO20	0.24	0.24	VALE12	0.00	0.00
ONTO20	0.54	0.54	ONTO18	0.18	0.18	ONTO24	0.00	0.00
HGTN12	0.52	0.52	HOLY12	0.15	0.15	OYDM11	0.00	0.00
ONTO18	0.32	0.32	HGTN12	0.15	0.15	PNCK11	0.00	0.00
ONTO25	0.11	0.11	ONTO25	0.05	0.05	PNCK12	0.00	0.00
JNVY11	0.09	0.09	RKVL11	0.03	0.03	PRMA12	0.00	0.00
RKVL11	0.05	0.05	JNVY11	0.02	0.02	UNTY12	0.00	0.00
PNCK11	0.00	0.00	HOLY14	0.00	0.00	ONTO20	0.00	0.00
OIDA12	0.00	0.00	HCSU11	0.00	0.00	NYSA15	0.00	0.00
ONTO14	0.00	0.00	PNCK11	0.00	0.00	OBPR11	0.00	0.00
OBPR11	0.00	0.00	OIDA12	0.00	0.00	OIDA11	0.00	0.00
HOLY14	0.00	0.00	ONTO14	0.00	0.00	OIDA12	0.00	0.00
HCSU11	0.00	0.00	OBPR11	0.00	0.00	ONTO14	0.00	0.00

Table 9 2021 Descending Indices by Circuit

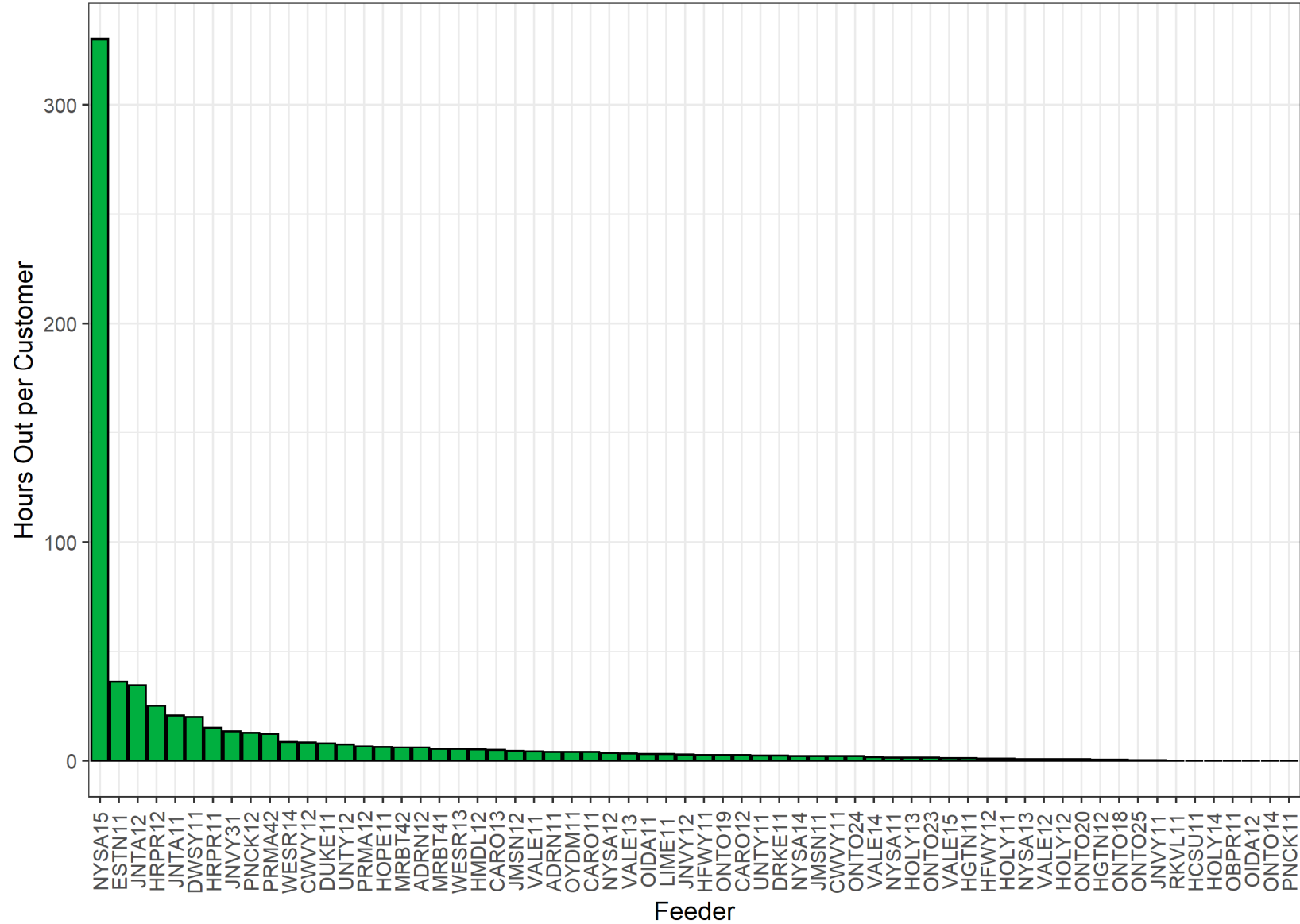


Figure 9 2021 Descending SAIDI by Circuit

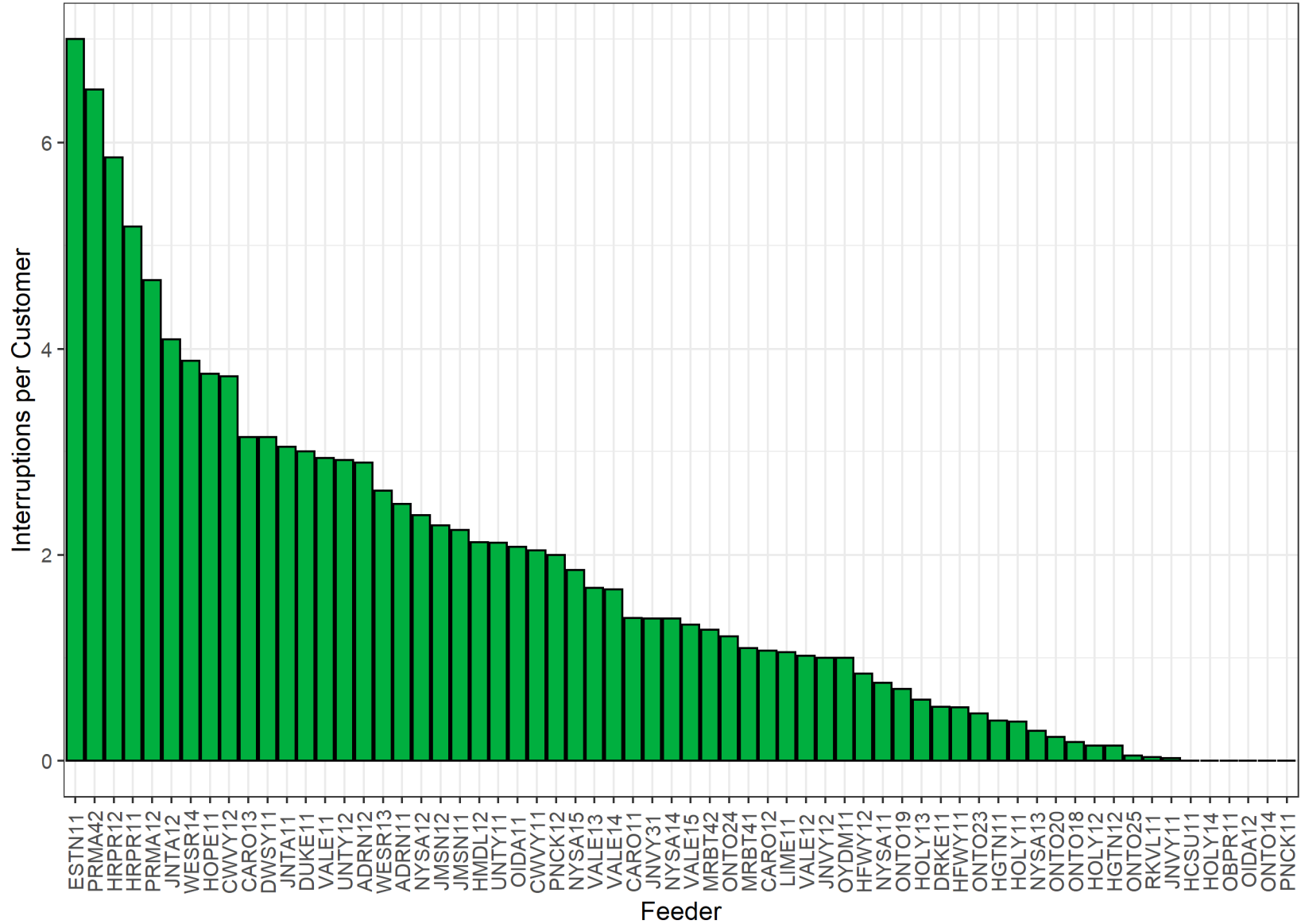


Figure 10 2021 Descending SAIFI by Circuit

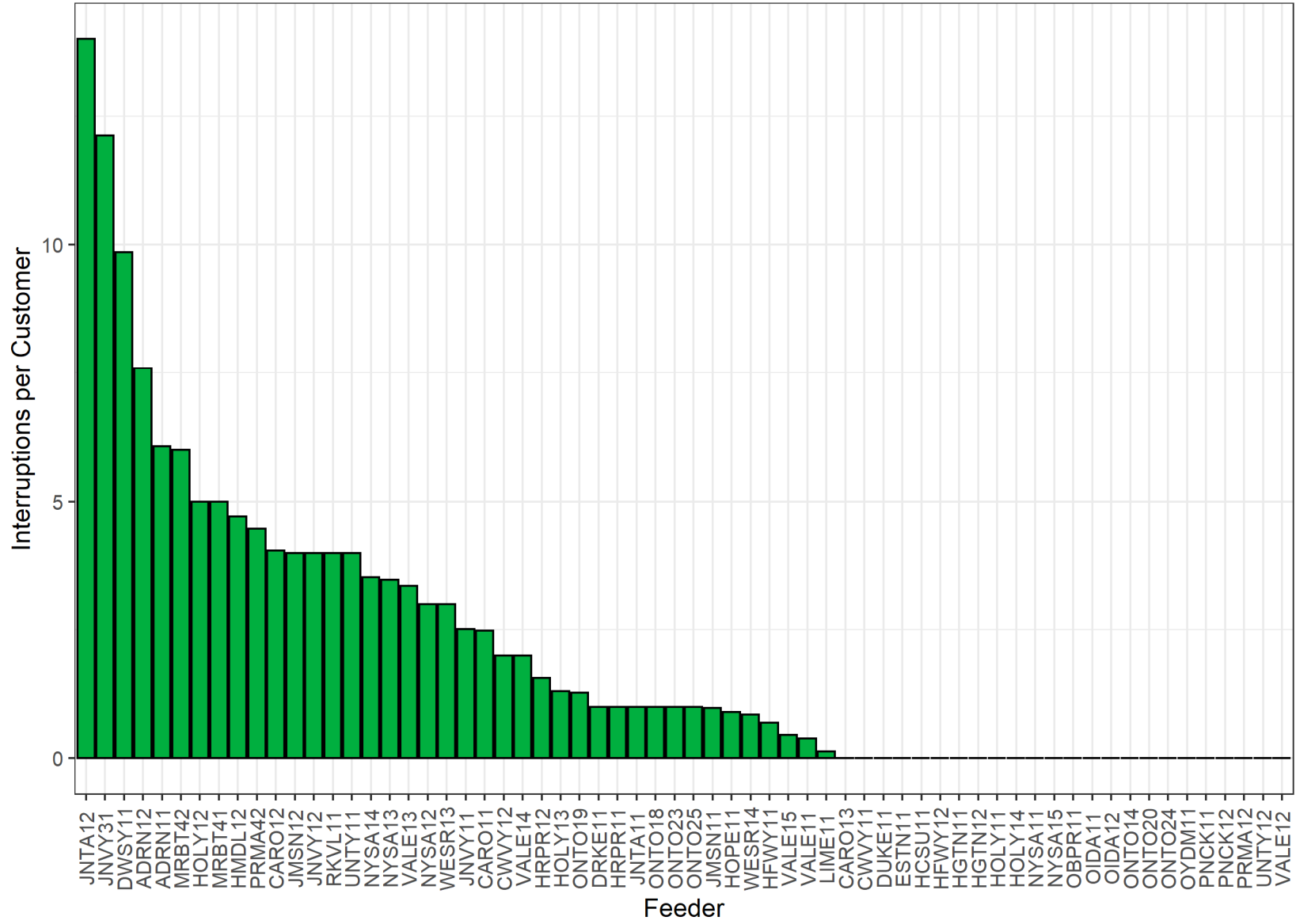


Figure 11 2021 Descending MAIFIE by Circuit

# APPENDIX

## Circuit Reference Information

Circuit	Substation	Operating Area	Voltage (kV)	Customers*
ADRN11	Adrian	Western	12.5	415
ADRN12	Adrian	Western	12.5	615
CARO11	Cairo	Western	12.5	1,240
CARO12	Cairo	Western	12.5	89
CARO13	Cairo	Western	12.5	738
CWVY11	Cow Valley	Western	12.5	43
CWVY12	Cow Valley	Western	12.5	113
DRKE11	Durkee	Western	12.5	162
DUKE11	Duke	Western	12.5	28
DWSY11	Drewsey	Western	12.5	188
ESTN11	Easton	Western	12.5	2
HCSU11	Hells Canyon	Western	12.5	2
HFWD11	Halfway	Western	12.5	784
HFWD12	Halfway	Western	12.5	559
HGTN11	Huntington	Western	12.5	91
HGTN12	Huntington	Western	12.5	313
HMDL12	Homedale	Canyon	12.5	154
HOLY11	Holly	Western	12.5	200
HOLY12	Holly	Western	12.5	79
HOLY13	Holly	Western	12.5	170
HOLY14	Holly	Western	12.5	5
HOPE11	Hope	Western	12.5	154
HRPR11	Harper	Western	12.5	111
HRPR12	Harper	Western	12.5	194
JMSN11	Jamieson	Western	12.5	402
JMSN12	Jamieson	Western	12.5	239
JNTA11	Juntura	Western	12.5	65
JNTA12	Juntura	Western	12.5	53
JNVY11	Jordan Valley	Canyon	12.5	86
JNVY12	Jordan Valley	Canyon	12.5	118
JNVY31	Jordan Valley	Canyon	25.0	349
LIME11	Lime	Western	12.5	114
MRBT41	Malheur Butte	Western	34.5	32
MRBT42	Malheur Butte	Western	34.5	11
NYSA11	Nyssa	Western	12.5	852
NYSA12	Nyssa	Western	12.5	322
NYSA13	Nyssa	Western	12.5	771
NYSA14	Nyssa	Western	12.5	254
NYSA15	Nyssa	Western	12.5	13
OBPR11	Oxbow	Western	12.5	1
OIDA11	Ore-Ida	Western	12.5	682
OIDA12	Ore-Ida	Western	12.5	1
ONTO14	Ontario	Western	12.5	35
ONTO18	Ontario	Western	12.5	865
ONTO19	Ontario	Western	12.5	1,872
ONTO20	Ontario	Western	12.5	1,218
ONTO23	Ontario	Western	12.5	50
ONTO24	Ontario	Western	12.5	718
ONTO25	Ontario	Western	12.5	522
OYDM11	Owyhee Dam	Western	12.5	15
PNCK11	Pine Creek	Western	12.5	96
PNCK12	Pine Creek	Western	12.5	2
PRMA12	Parma	Western	12.5	3
PRMA42	Parma	Western	34.5	195
RKVL11	Rockville	Canyon	12.5	32
UNTY11	Unity	Western	12.5	150
UNTY12	Unity	Western	12.5	238
VALE11	Vale	Western	12.5	1,043
VALE12	Vale	Western	12.5	56
VALE13	Vale	Western	12.5	583
VALE14	Vale	Western	12.5	317
VALE15	Vale	Western	12.5	483
WESR13	Weiser	Western	12.5	196
WESR14	Weiser	Western	12.5	35

Table 10 Circuit Reference Information

\*Some circuits have customers in Idaho and Oregon. The counts are for Oregon customers only as of 12/31/2021.

## Five Years of System Pole and Trench Miles

Year	Overhead (OH) Pole Miles	Underground (UG) Trench Miles	Distribution All Miles	Transmission Line (Structure/Pole) Miles*	Percent OH / UG
2021	2,113.5	97.4	2,210.9	757.6	95%/5%
2020	2,113.2	94.0	2,207.2	757.3	95%/5%
2019	2,113.6	100.8	2,214.4	757.3	95%/5%
2018	2,113.0	99.9	2,212.9	757.0	95%/5%
2017	2,114.5	98.9	2,213.5	759.4	96%/4%

*Table 11 Five Years of System Pole and Trench Miles*

\*Transmission line miles include some lines that do not directly serve customer load.

### 2021 Major Event Day System Summary

Date	Cause	Customers	CMI	CI	SAIDI (Minutes)	SAIFI	CAIDI (Minutes)
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 12 2021 MED System Summary

### 2021 Major Event Day Feeder Summary

Date	Feeder	Customers	CMI	CI	SAIDI (Minutes)	SAIFI	CAIDI (Minutes)
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 13 2021 MED Feeder Summary

### Five Years of Major Event Days

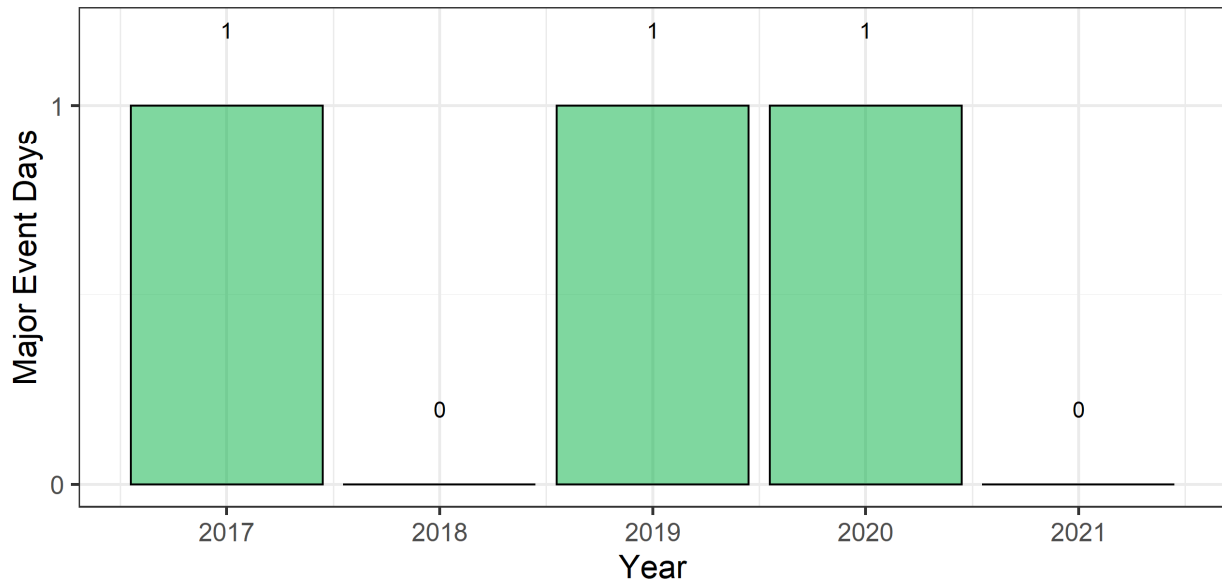


Figure 12 Five Years of MEDs

## Cause Category Translation

<b>Idaho Power Cause</b>	<b>OAR 860-023-0151 (2)(b) Cause</b>
Loss of Supply – Transmission*	Loss of Supply – Transmission
Loss of Supply – Station*	Loss of Supply – Substation
Corrosion/Rot	Distribution – Equipment
Electrical Failure	Distribution – Equipment
Loose Hardware	Distribution – Equipment
Mechanical Failure	Distribution – Equipment
Improper Installation	Distribution – Equipment
Contamination	Distribution – Equipment
Lightning	Distribution – Lightning
Other IPC Circuit	Distribution – Other
Other (Define in Comments)	Distribution – Other
Safety Precaution	Distribution – Other
Utility Operating Error	Distribution – Other
Planned Maintenance	Distribution – Planned
Structures (Signs, Buildings)	Distribution – Public
Construction/Dig-in	Distribution – Public
Foreign Object (Pipe, Kite, Tree Trim)	Distribution – Public
Vandalism	Distribution – Public
Vehicle Collision	Distribution – Public
Momentary (Tripping)	Distribution – Unknown
Unknown	Distribution – Unknown
Tree/Vegetation	Distribution – Vegetation
Loading/Unloading (Snow, Ice)	Distribution – Weather (Non-Lightning)
Unstable Earth	Distribution – Weather (Non-Lightning)
Load Shed/Transfer	Distribution – Weather (Non-Lightning)
Wildland/Building Fire	Distribution – Weather (Non-Lightning)
Overload/Cold Load	Distribution – Weather (Non-Lightning)
Bird – NonRaptor	Distribution – Wildlife
Bird – Raptor	Distribution – Wildlife
Large Animal (Livestock)	Distribution – Wildlife
Small Animal	Distribution – Wildlife

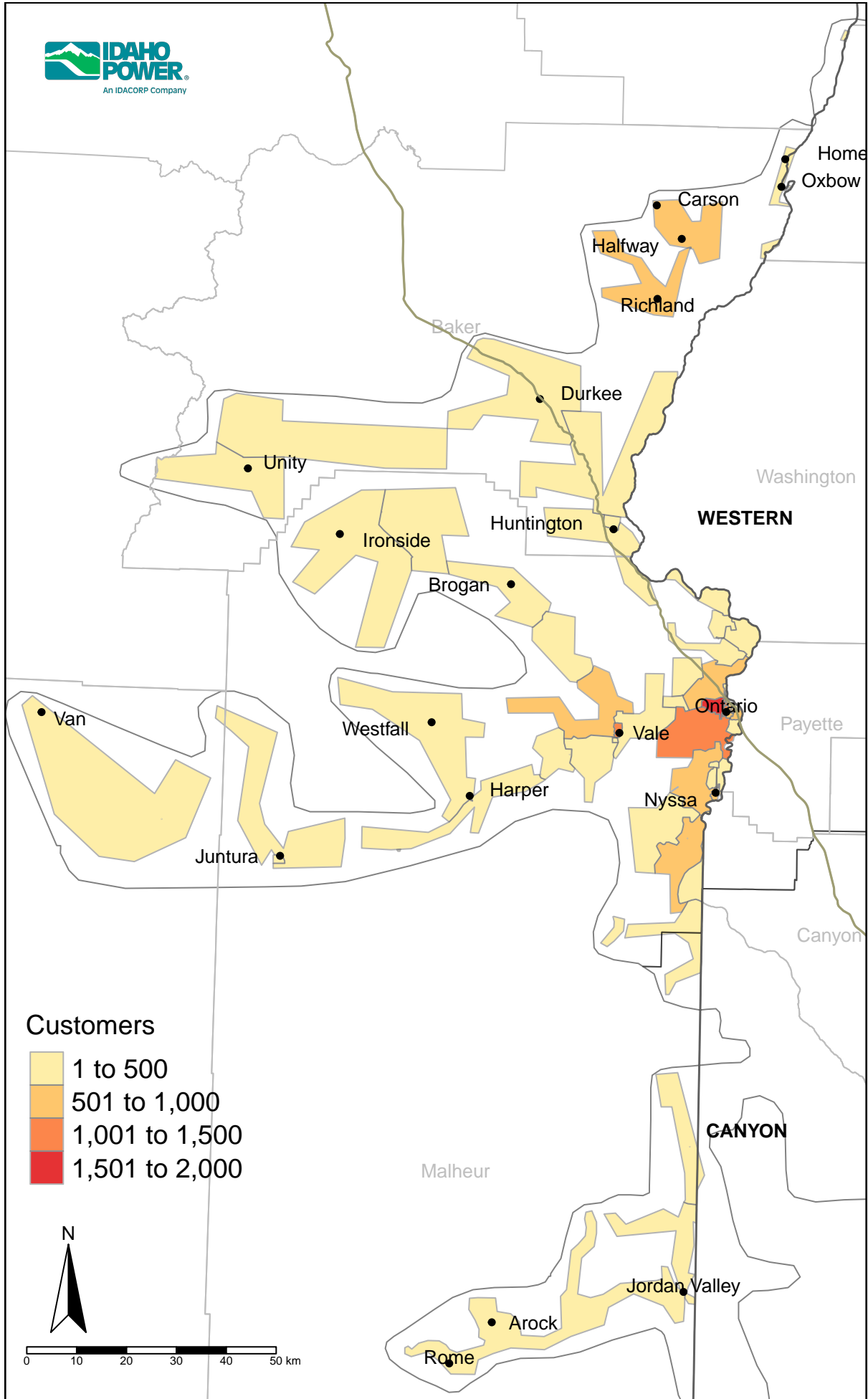
*Table 14 Cause Category Translation*

\*These are also identified from the Idaho Power SYSTEM field. This field has values for “Transmission”, “Substation”, “Distribution Primary OH”, “Distribution Primary UG”, “Secondary/Service OH” and “Secondary/Service UG”. So, “Loss of Supply – Transmission” in this report includes events where the CAUSE field was “Loss of Supply – Transmission” **or** the SYSTEM field was “Transmission”, and “Loss of Supply – Substation” includes events where the CAUSE field was “Loss of Supply – Station” **or** the SYSTEM field was “Substation”.

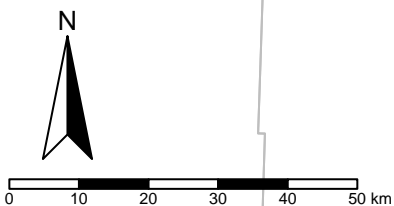
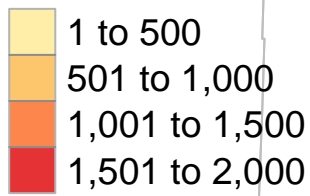


# MAPS

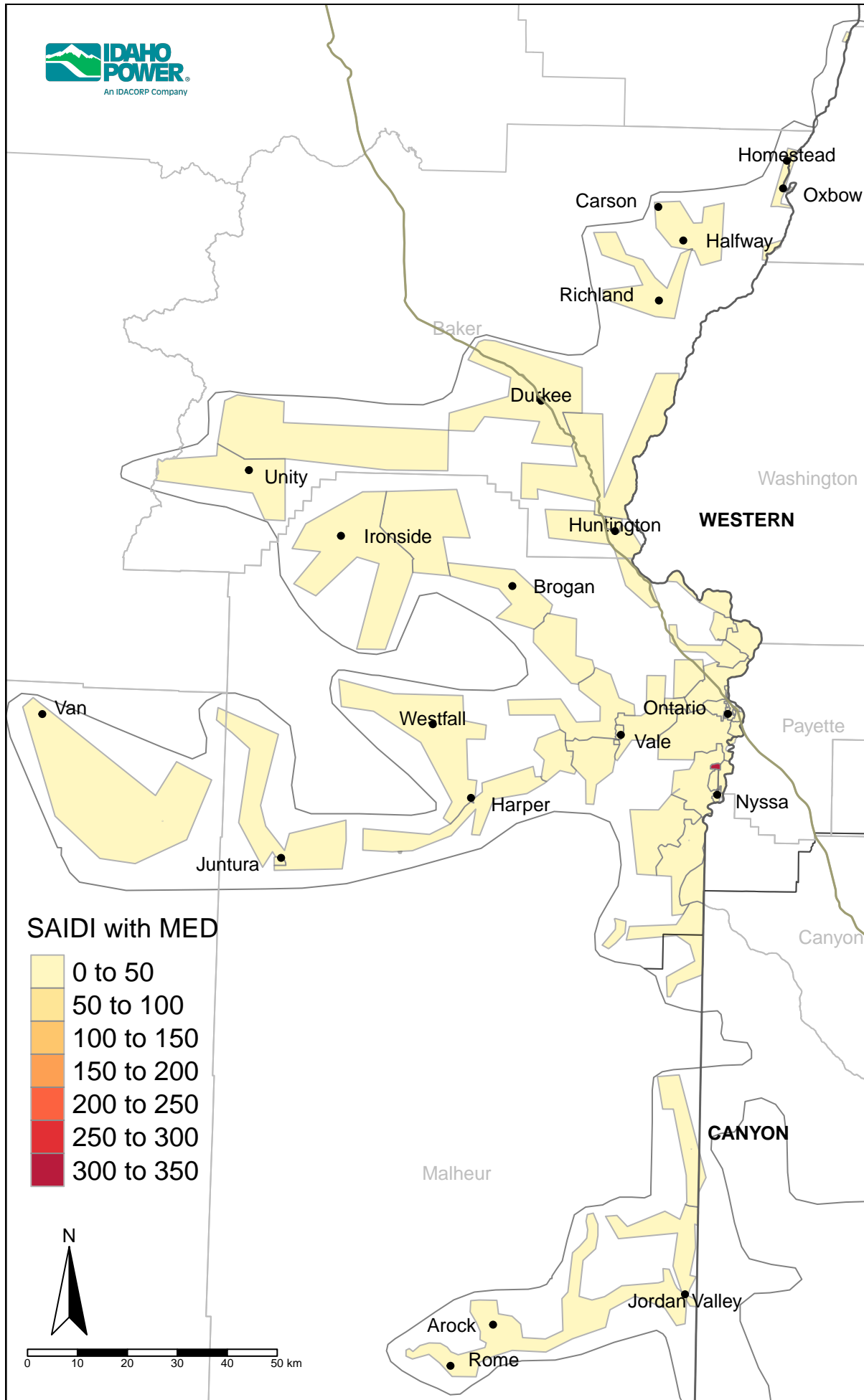
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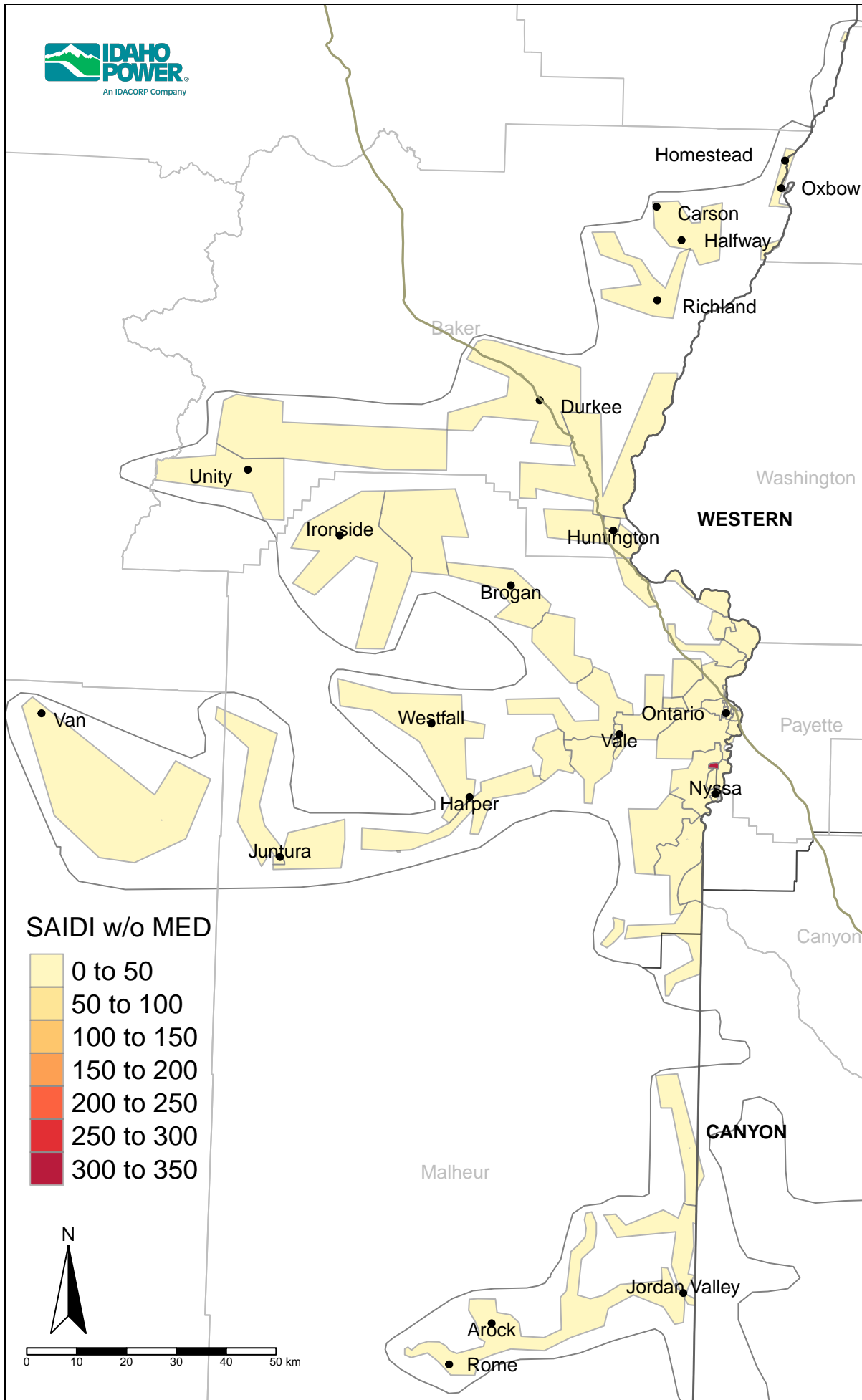
## Customers



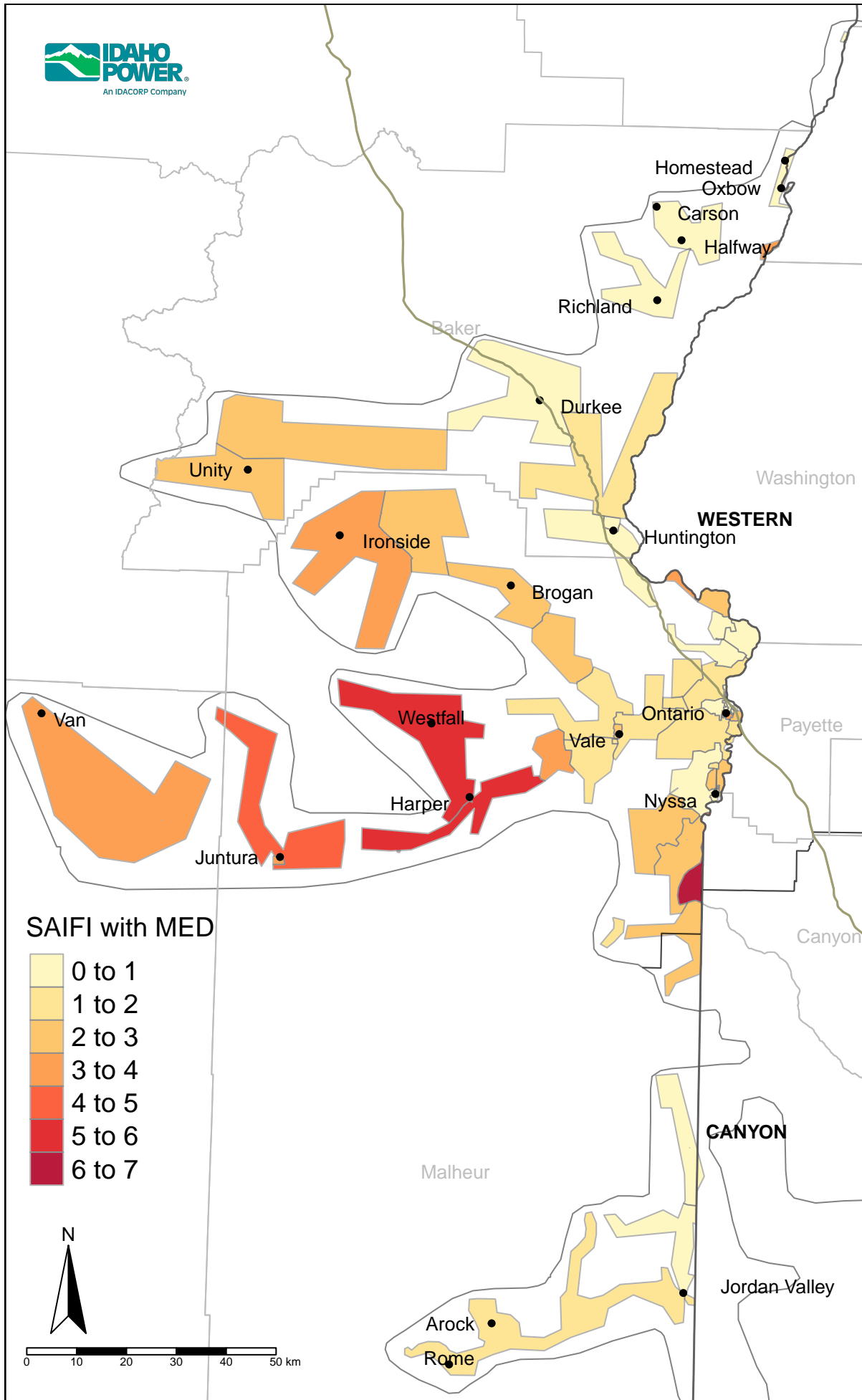
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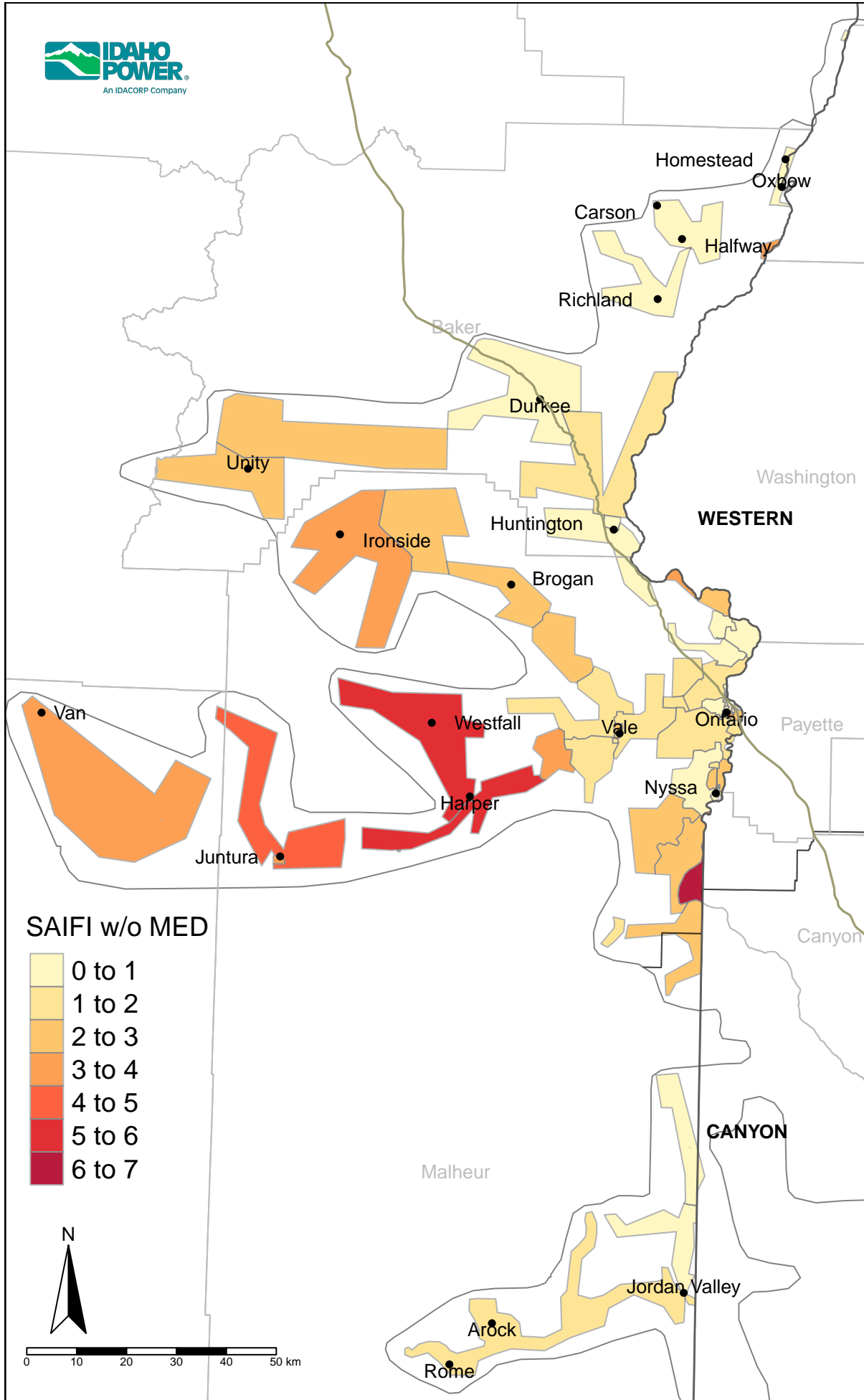
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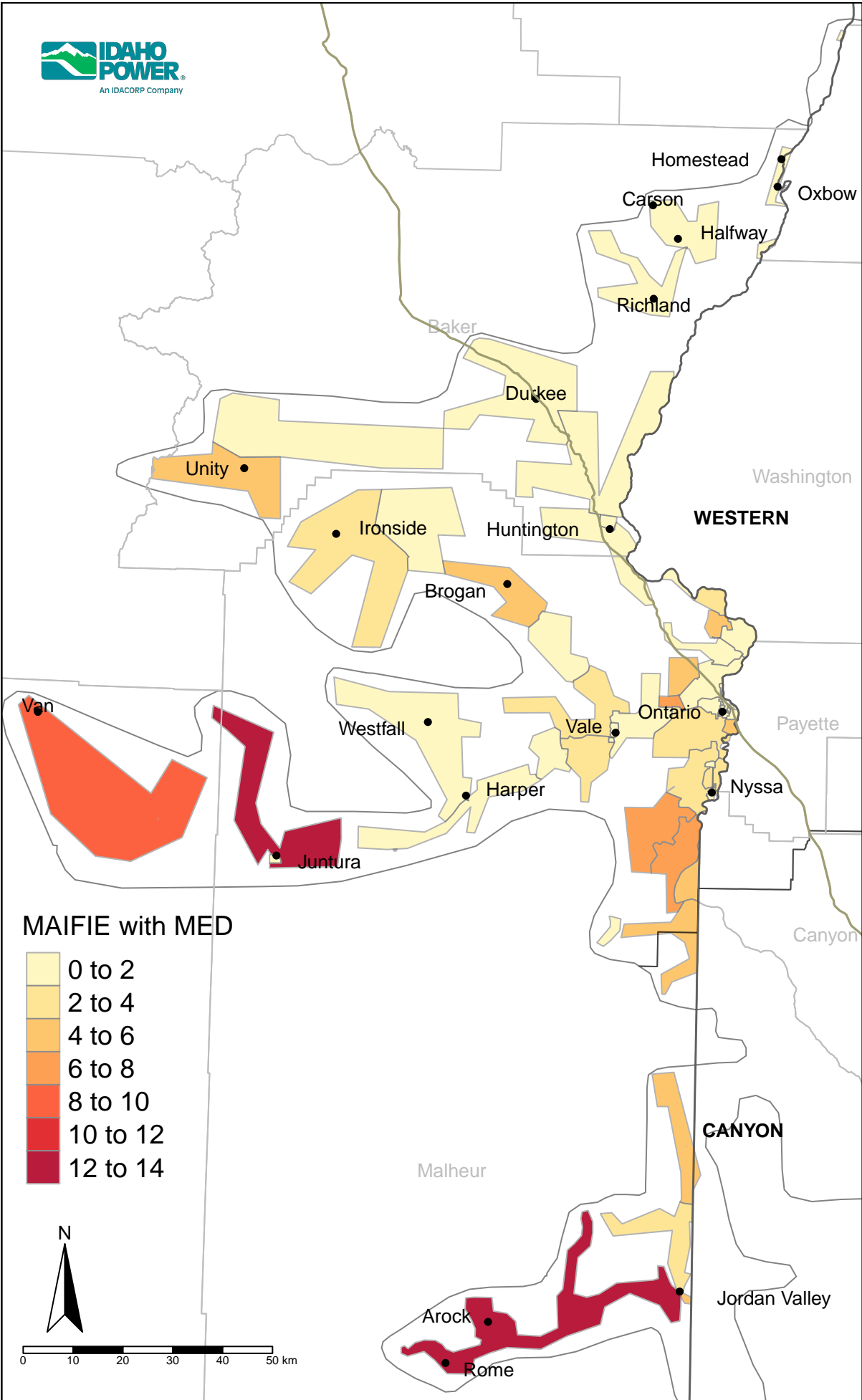
# 2021 SAIFI with MED Oregon Area



# 2021 SAIFI w/o MED Oregon Area



# 2021 MAIFIE with MED Oregon Area



# 2021 MAIFIE w/o MED Oregon Area

