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KANSAS STATISTICS SUMMARY (2011 - 2024)										
20	CLIMATE DISASTER DECLARATIONS									
\$225.6 MILLION	FEMA + HUD POST-DISASTER FUNDING									
2.9 MILLION PEOPLE	POPULATION TOTAL									
\$77	PER CAPITA SPENDING ON CLIMATE DISASTERS									
BARTON & PAWNEE (11 DISASTERS)	COUNTY WITH THE HIGHEST DISASTER OCCURRENCES									
54	COUNTIES HAVE HAD FIVE OR MORE DISASTERS									
294K PEOPLE	LIVE IN AREAS WITH VERY HIGH SOCIAL VULNERABILITY (SVI > 0.75)									
4.8 HOURS	TOTAL OUTAGE DURATION (HOURS PER CUSTOMER PER YEAR)									
C (2018)	ASCE INFRASTRUCTURE REPORT CARD GRADE									
20	SUPERFUND SITES									
\$3.0 BILLION	CLIMATE INFRASTRUCTURE SUPPORTED THROUGH SMALL INSURANCE SURCHARGE									
\$3 BILLION	OF CLIMATE INFRASTRUCTURE COULD BE SUPPORTED THROUGH A SMALL INSURANCE SURCHARGE									

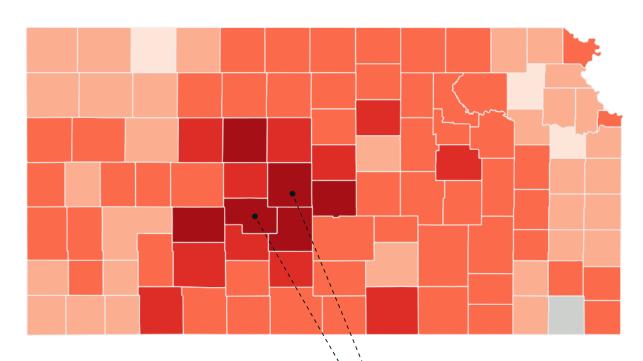
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#### **DISASTER OCCURRENCES 2011–2024**

FEDERALLY DECLARED MAJOR DISASTERS BY COUNTY

## disaster declarations

All but one Kansas county has had a disaster declaration since 2011.



#### **Number of Disaster Events**

Major Disaster Declarations (2011-2024)

0 occurences

1 occurrence

2-3 occurences

4-6 occurrences

7-9 occurrences

10+ occurrences

MAP MADE BY REBUILD BY DESIGN FEMA DATA COURTESY OF IPARAMETRICS

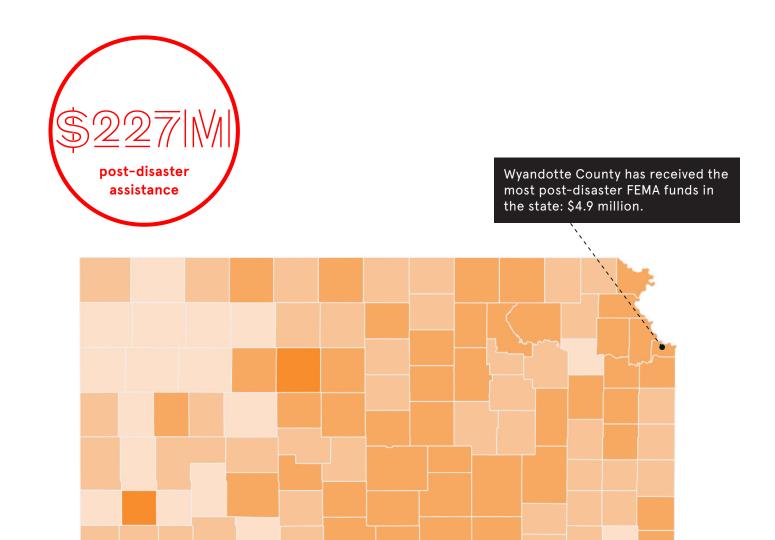
Barton and Pawnee County have

had the highest number of recent

disasters in the state: 11 disasters.

#### FEDERAL ASSISTANCE 2011-2024

POST-DISASTER PUBLIC ASSISTANCE AND HAZARD MITIGATION FUNDS OBLIGATED BY COUNTY FOR CLIMATE DISASTERS



#### FEMA Public Assistance and Hazard Mitigation

Federal Share Obligated (2011-2024)

\$0 to \$100K

\$100K to \$1M

\$1M to \$10M

\$10M to \$50M

\$50M to \$100M

\$100M to \$500M

\$227M FEMA obligations

\$0 HUD CDBG-DR Funds

\$227M FEMA + HUD assistance

\$77 per capita cost

MAP MADE BY REBUILD BY DESIGN FEMA DATA COURTESY OF IPARAMETRICS

97

6

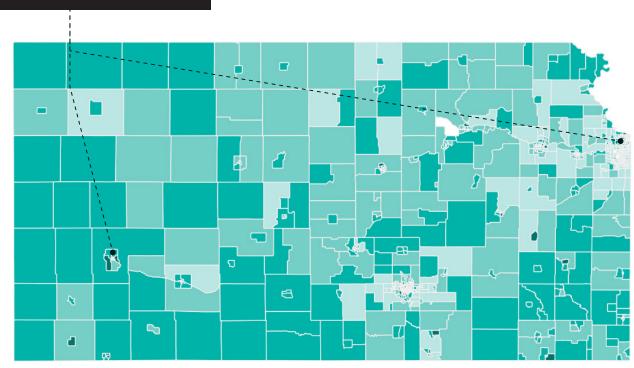
#### **SOCIAL VULNERABILITY INDEX 2022**

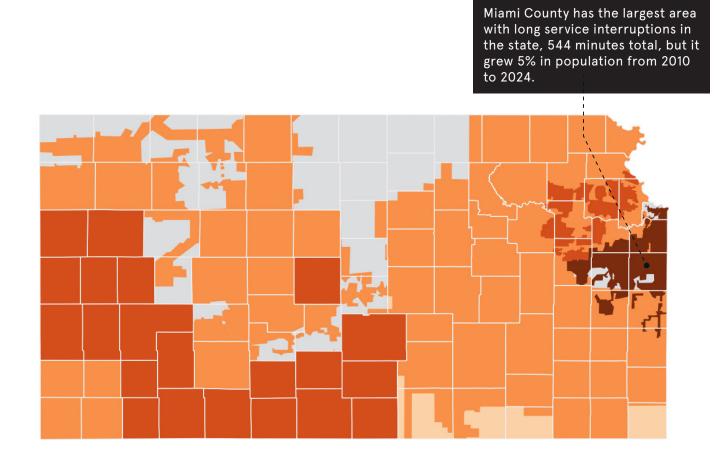
#### AREAS OF GREATEST SOCIAL VULNERABILITY

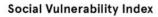
#### **ENERGY RELIABILITY 2023**

**COUNTIES AT GREATEST RISK OF POWER OUTAGES** 

Wyandotte and Finney County both have social vulnerabilities above 0.9 and experienced a decrease in population from 2010 to 2024.







CDC (2022)

No Value 0.0 - 0.2

0.2 - 0.4

0.4 - 0.6 0.6 - 0.8

0.8 - 1.0

MAP MADE BY REBUILD BY DESIGN DATA SOURCE: CDC/ATSDR 2022 SVI

#### **Aggregated Annual Electric Outage Duration** Including major events - SAIDI\_W\_MED

missing electric outage data

0 - 60 minutes

60 - 120 minutes

120 - 240 minutes 240 - 456 minutes

456-7,700 minutes

MAP MADE BY REBUILD BY DESIGN SOURCE: U.S. ENERGY INFORMATION ADMINISTRATION 2023

TOTAL: 20 DISASTERS FEMA PA + HM: \$225.6 M HUD CDBG-DR: \$0 FEMA + HUD ASSISTANCE:	: \$225.6 M		Total		2011 4010: SEVERE STORMS, STRAIGHT-LINE WINDS, TORNADOES, AND FLOODING 4035: FLOODING	2012 4063: SEVERE STORMS, TORNADOES, STRAIGHT- LINE WINDS, AND FLOODING	4112: SNOWSTORM	4150: SEVER STRAIGHT-LI TORNADO FLOOI	INE WINDS, DES, AND DING	2015 4230: SEVERE STO TORNADOES, STRA LINE WINDS, AI FLOODING	AIGHT- 4287: SEVER	E STORMS ODING	4304: SEVERE WINTER STORM	2017 4319: SEVERE STORM, SNOW STRAIGHT-LINE N FLOODI	WINTER WSTORM, WINDS, AND NG 4347: SEVERE STORMS, STRAIGHT-LINE WINDS, AND FLOODING	201 4403: SEVER STRAIGHT-LI AND FLO	RE STORMS, INE WINDS, ODDING  4417: SEVERE STORMS, STRAIGHT-LINE WINDS, AND FLOODING	2019  4449: SEVERE STOR  STRAIGHT-LINE WIN  TORNADOES,  FLOODING, LANDSLIDES	AND STRAIGH	KE STURIVIS	4654: SEVERE STORMS AND S' LINE WIN	TRAIGHT- DS TORNADOE FLOOD	E STORMS, NE WINDS, ES, AND DING	4774: SEVERE STOR	WINTER STRAIGHT-LINE		FLOODING
	OF DISASTERS	FEMA TOTAL	PA Obligations HM	M Obligations	PA HM PA HM Obligations Obligations Obligation	PA HM ons Obligations Obligations O	PA HM Obligations Obligations	PA Obligations	HM Obligations	PA Obligations Obli	HM PA igations Obligations	HM Obligations	PA Obligations Obligations	PA Obligations	HM PA HM Obligations Obligations Obligations	PA Obligations	HM PA HM Obligations Obligations Obligations	PA Obligations Obliga	PA Obligation	HM Obligations	PA Obligations C	HM PA Obligations Obligations	HM Obligations	PA Obligations O	HM PA bligations Obligations Obli	HM PA I gations Obligations Oblig	HM PA HM gations Obligation
20000 20000: Statewide 2 20001 20001: Allen County 3		\$30,747,916.46 \$650,866.75	\$29,222,992.27 \$ \$650,866.75	\$1,524,924.19 \$0.00	\$1,437,576.22 \$30,883.00 \$717,170.15 \$23,894.	1.00 \$587,564.88 \$33,862.00 \$	\$315,767.54 \$9,254.0	\$1,076,565.55	\$70,737.00	\$1,356,101.52 \$75	5,877.48 \$1,732,277.81	\$61,295.18	\$9,605,343.29 \$60,781.4	0 \$1,686,317.57	\$445,536.93 \$192,385.00 \$58,043.96	\$1,242,858.90	\$50,039.15 \$401,365.12 \$114,336.09	9 \$5,605,613.73 \$112, \$267,056.12	\$37.53 \$1,038,878.1 \$0.00	3 \$50,875.00	\$335,212.11	\$19,185.00 \$378,398.95 \$383,810.63	\$147,682.50 \$0.00	\$378,398.95	28,399.97 \$378,398.95 \$90 \$0.00	096.00 \$378,398.95 \$41, \$0.00	,508.00 \$378,398.95 \$0.0
20003 20003: Anderson County 3		\$4,172,738.56	\$4,172,738.56	\$0.00	#450.750.00	200				<b>#252.000.00</b>	<b>#0.00</b>						\$196,761.50 \$0.00	\$3,975,977.06	\$0.00						\$0.00	\$0.00	
20005 20005: Atchison County 3 20007 20007: Barber County 5		\$1,165,231.96 \$1,524,580.24	\$1,165,231.96 \$730,342.24	\$0.00 \$794,238.00	\$453,753.20 \$0.		\$26,703.93 \$0.00	\$0.00	\$0.00	\$353,293.63	\$0.00					\$157,781.85	\$0.00 \$87,795.55 \$0.00	\$358,185.13 0 \$458,060.91 \$794,	\$0.00 238.00								
20009 20009: Barton County 1	•	\$3,679,628.59	\$3,679,628.59	\$0.00	\$0.00		\$88,273.18 \$0.00		\$0.00	\$82,042.14	\$0.00		\$244,632.64 \$0.0	0			\$182,607.66 \$0.00		\$0.00 \$785,904.7	\$0.00	\$0.00	\$0.00 \$602,513.24	\$0.00		<b>\$0.00</b>	\$0.00	\$0.00
20011 20011: Bourbon County 3 20013 20013: Brown County 3		\$420,878.92 \$978,699.46	\$400,686.92 \$978,699.46	\$20,192.00 \$0.00				\$32,650.00	\$20,192.00	\$176,287.71	\$0.00							\$368,036.92 \$802,411.75	\$0.00 \$0.00 \$0.00	0 \$0.00					\$0.00	\$0.00	
20015 20015: Butler County 4		\$3,815,955.01	\$3,815,955.01	\$0.00				\$701,744.04	\$0.00		\$0.00							\$2,599,364.07	\$0.00					\$43,673.45	\$0.00		<b>#0.00 #0.0</b>
20017 20017: Chase County 5 20019: Chautauqua 4		\$940,794.43 \$358,515.21	\$940,794.43 \$358,515.21	\$0.00 \$0.00				\$50,708.24 \$8,858.77	\$0.00 \$0.00	,,	\$0.00 \$0.00							\$785,064.38 \$268,908.92	\$0.00 \$0.00					\$0.00	\$0.00	\$0.00	\$0.00 \$0.0
County 20021 20021: Cherokee County 5		\$2,047,938.60	\$858,860.22						\$341,130.00	, , , , , , , , , , , , , , , , , , , ,				\$185,663.04	\$99,174.15			\$622,387.29	\$0.00						\$0.00		
20023 20023: Cheyenne County 3		\$186,127.70	\$108,135.20	\$77,992.50						\$46,416.89 \$77		\$0.00		\$18,208.64	\$0.00										1222		
20025 20025: Clark County 6 20027 20027: Clay County 6		\$70,441.42 \$1,702,789.07	\$70,441.42 \$1,238,758.07	\$0.00 \$464.031.00	\$537.181.67 \$0.00			\$4,634.31 \$147,695.36	\$0.00 \$464.031.00	\$211,272,63	\$0.00		\$65,807.11 \$0.0	0		\$48,086.94	\$0.00	\$0.00 \$274,320.69	\$0.00 \$0.00 \$20,200.7	8 \$0.00	\$0.00	\$0.00 \$0.00	\$0.00				\$0.00 \$0.0
20029 20029: Cloud County 6		\$671,113.83	\$671,113.83	\$0.00	7000,0000			\$10,758.48	\$0.00	\$0.00	\$0.00					<b>V</b> 10,000.01	7.00	\$156,126.42	\$0.00 \$350,691.8					\$0.00	\$0.00		
20031 20031: Coffey County 4 20033 20033: Comanche County 6		\$944,187.91 \$174,271.41	\$944,187.91 \$174,271.41	\$0.00 \$0.00				\$23,646.30 \$9,823.16	\$0.00 \$0.00	*	\$0.00		\$55,709.22 \$0.0	0				\$723,948.26 \$9,075.27	\$0.00 \$0.00		\$0.00	\$30,995.42 \$0.00 \$99,663.76					\$0.00 \$0.0
20035 20035: Cowley County 6		\$4,315,763.03		\$579,797.00		\$7,821.38 \$0.00		\$407,585.63	\$0.00		\$0.00 \$245,840.71	\$0.00	¥50,750. <b>=</b>				\$157,273.41 \$0.00	\$2,286,722.41 \$579,	*****		40.00						<b>4</b> 0.00
20037 20037: Crawford County 4 20039 20039: Decatur County 1		\$2,665,209.09 \$122,245.12	\$669,696.13 \$ \$122,245.12	\$1,995,512.96				\$122,133.26	\$33,370.00					\$23,602.19 \$ \$122,245.12	\$1,962,142.96			\$432,229.62	\$0.00			\$91,731.06	\$0.00				
20041 20041: Dickinson County 5		\$1,680,550.62	\$1,283,068.62	\$397,482.00			\$41,772.36 \$0.0	\$409,428.60	\$0.00					ψ122,210.12	<b>V</b> 0.00			\$687,630.80 \$397,	\$135,535.8	1 \$0.00							
20043 20043: Doniphan County 6 20045 20045: Douglas County 1		, , , , , , ,	\$1,340,811.72 \$1,411,299.88	\$0.00 \$110,313.24	\$535,438.59 \$0.	0.00				\$256,950.04	\$0.00						\$122,241.93 \$0.00	\$426,181.16 \$1,411,299.88 \$110,	\$0.00 \$0.0 313.24	0 \$0.00							\$0.00 \$0.0
20047 20047: Edwards County 9		\$1,078,941.85	\$1,078,941.85	\$0.00		\$12,279.65 \$0.00		\$20,244.38	\$0.00	*	\$0.00		\$255,236.74 \$0.0	0				\$39,788.90	\$0.00 \$614,544.3	8 \$0.00	\$0.00	\$0.00 \$0.00	\$0.00	\$0.00	\$0.00		
20049 20049: Elk County 4 20051 20051: Ellis County 1		\$530,400.57 \$11,292,482.73	\$530,400.57 \$11,292,482.73	\$0.00 \$0.00	\$300,096.42 \$0.00	\$1,542,090.68 \$0.00 \$	\$106,940.19 \$0.0	\$0.00 \$43,599.45	\$0.00 \$0.00		\$0.00 \$399,001.95	\$0.00		\$6,866,301.26	\$0.00			\$513,097.70 \$721,607.62	\$0.00 \$0.00 \$621,525.6	1 \$0.00	\$0.00	\$0.00 \$691,319.55	\$0.00		\$0.00	\$0.00	
20053 20053: Ellsworth County 7	•	\$805,149.52	\$751,899.52	\$53,250.00	ψο.ου	\$0.00 \$0.00	φυ.υ	\$89,191.87	\$53,250.00		\$0.00	<b>\$0.00</b>	\$11,122.69 \$0.0	0				\$252,713.90	\$0.00 \$353,368.5		ψ3.00					\$0.00	
20055 20055: Finney County 3 20057 20057: Ford County 7		\$650,665.76 \$1,803,653.79	\$650,665.76 \$1,803,653.79	\$0.00 \$0.00				\$82,326.13	\$0.00				\$594,236.68 \$0.0	\$593,228.34 0	\$0.00			\$294.670.68	\$0.00 \$369,996.2	8 \$0.00	\$365,994.38	\$57,437.42 \$0.00 \$96,429.64			\$0.00		\$0.00 \$0.0
20059 20059: Franklin County 3		\$2,664,642.12	\$2,664,642.12	\$0.00			\$85,477.11 \$0.00			\$390,406.93	\$0.00		φυ.υ					\$2,188,758.08	\$0.00		, : : : : : : : : : : : : : : : : : : :	Ç50,723.04	ψ0.00				
20061 20061: Geary County 5 20063 20063: Gove County 2		\$457,022.25 \$89,312.41	\$457,022.25 \$89,312.41	\$0.00 \$0.00				\$236,729.13	\$0.00					\$16,446.38	\$0.00			\$126,338.12	\$0.00 \$93,955.0 \$72,866.0					\$0.00	\$0.00		\$0.00 \$0.0
20065 20065: Graham County 4		\$99,495.45	\$99,495.45	\$0.00							\$99,495.45	\$0.00		\$0.00	\$0.00				\$0.0	0 \$0.00	\$0.00	\$0.00					
20067 20067: Grant County 4		\$38,875,411.67 \$17,380.33	\$38,875,411.67 \$17,380.33	\$0.00 \$0.00	\$80,070.69 \$0.00			\$115,594.23	\$0.00		\$0.00			\$38,505,819.44	\$0.00			\$0.00	\$173,927.3 \$0.00 \$0.00		\$0.00	\$0.00		\$0.00	\$0.00		\$0.00 \$0.0
20069 20069: Gray County 6 20071 20071: Greeley County 5		\$17,380.33 \$340,356.07	\$17,380.33 \$340,356.07	\$0.00						φ17,360.33	ψ0.00			\$32,782.28	\$0.00			\$0.00 \$155,703.72	\$0.00 \$0.00 \$0.00 \$151,870.0		<b>Ф</b> 0.00		\$0.00				\$0.00 \$0.0 \$0.00 \$0.0
20073 20075: Hamilton County 5		\$3,185,845.74 \$210,507,31	\$3,185,845.74 \$210,507.31	\$0.00 \$0.00	\$0.00 \$0.00			\$164,127.32 \$46,698.08	\$0.00 \$0.00		\$0.00 \$461,525.96	\$0.00		\$68,852.27	\$0.00		\$386,489.17 \$0.00	\$1,670,676.50	\$0.00 \$94,956.9	6 \$0.00					\$0.00	\$0.00	\$0.00 \$0.0
20075 20075: Hamilton County 5 20077 20077: Harper County 5		\$210,507.31 \$1,225,508.30	\$210,507.31 \$1,225,508.30	\$0.00	φυ.υυ φυ.υυ	\$66,452.11 \$0.00	\$18,722.36 \$0.0	\$46,698.08	\$0.00		\$0.00			φ00,052.27	φυ.υυ			\$739,052.27	\$94,956.9	φυ.υυ							φυ.υυ \$0.0
20079 20079: Harvey County 6		\$2,369,760.54 \$20,177,44	\$2,260,897.74 \$20,177.44	\$108,862.80 \$0.00			\$74,910.54 \$0.0	\$527,643.59	\$0.00	+===,	\$0.00			\$19,802.44	\$0.00		\$111,648.82 \$0.00	\$1,315,984.08 \$108,	\$0.0	0 00 00						\$0.00	\$0.00
20081 20081: Haskell County 3 20083 20083: Hodgeman County 1		\$20,177.44 \$733,782.87		\$0.00 \$44,334.02		\$9,348.98 \$0.00	\$27,816.20 \$0.0	\$8,696.93	\$0.00	\$375.00 \$75,984.95	\$0.00 \$0.00		\$46,813.63 \$0.0		φυ.υυ			\$93,009.02 \$44,			\$0.00	\$0.00		\$0.00	\$0.00	\$0.00	\$0.00
20085 20085: Jackson County 1		\$624,361.64 \$2,030,856.83	\$624,361.64 \$1,967,775.83	\$0.00 \$63,081.00						\$624,361.64 \$548,519.33 \$63	\$0.00							\$1,419,256.50	\$0.00								
20087 20087: Jefferson County 2 20089 20089: Jewell County 5		\$2,030,856.83 \$209,556.30	\$1,967,775.83 \$202,318.30		\$38,963.49 \$7,238.00	\$34,443.93 \$0.00					\$0.00		\$3,587.54 \$0.0	0				ψ1,418,∠36.5U		0 \$0.00							
20091 20091: Johnson County 3		\$4,341,725.41 \$60,501,84	\$4,341,725.41	\$0.00	\$20,002.83 \$0.	0.00								\$60.504.01	\$3,393,810.61 \$0.00				00.0	0 0000		\$927,911.97	·				00.00
20093 20093: Kearny County 4 20095 20095: Kingman County 6		\$69,591.84 \$3,495,716.43	\$69,591.84 \$3,495,716.43	\$0.00 \$0.00			\$49,678.53 \$0.0	\$88,184.33	\$0.00		\$413,292.03	\$0.00		\$69,591.84	\$0.00	\$202,482.40	\$0.00 \$697,030.56 \$0.00	\$2,045,048.58	\$0.00	0 \$0.00		\$0.00	\$0.00				\$0.00 \$0.0
20097 20097: Kiowa County 5		\$231,617.75	\$231,617.75	\$0.00		\$0.00 \$0.00		\$41,104.06	\$0.00				\$152,095.77 \$0.0		¢0.00	\$38,417.92	\$0.00		0000 710	1	\$0.00						
20101 20101: Lane County 20103 20103: Leavenworth 2		\$810,987.62 \$1,323,572.52	\$810,987.62 \$1,323,572.52	\$0.00 \$0.00	\$507,100.39 \$0.	0.00		\$39,282.23	\$0.00					\$187,323.97	\$0.00			\$816,472.13	\$383,518.1 \$0.00	\$0.00	\$200,863.28	\$0.00					
20105 20105: Lincoln County 4		\$561,402.65	\$561,402.65	\$0.00				<b>M</b> 40.03										\$0.00	\$0.00 \$0.0	0 \$0.00						\$0.00	\$0.00
20107 20107: Linn County 3 20109 20109: Logan County 4		\$606,371.46 \$75,043.61	\$606,371.46 \$75,043.61	\$0.00 \$0.00	\$0.00 \$0.00			\$42,927.25	\$0.00					\$48,559.51	\$0.00			\$563,444.21	\$0.00 \$26,484.1	0 \$0.00					\$0.00	\$0.00	\$0.00 \$0.0
20111 20111: Lyon County 4		\$4,535,794.42	\$4,353,963.42	\$181,831.00	\$880,970.07 \$181,831.00		<b>MAC 000 07</b>	\$11,157.01	\$0.00		\$0.00							\$3,395,761.36	\$0.00								
<ul><li>20113 20113: McPherson County 5</li><li>20115 20115: Marion County 6</li></ul>		\$1,350,486.79 \$660,028.68	\$1,219,714.79 \$660,028.68	\$130,772.00 \$0.00	\$0.00 \$0.00		\$46,938.05 \$130,772.00 \$40,661.61 \$0.00		\$0.00 \$0.00	7-3,33-11	\$0.00 \$0.00						\$18,881.25 \$0.00	\$802,663.31 \$374,502.13	\$0.00 \$0.00					\$0.00	\$0.00		
20117 20117: Marshall County 4		\$1,172,066.69	\$1,172,066.69	\$0.00				<b>M</b> 40.035		\$431,630.13	\$0.00		004.045.40	0 000	0.00	\$239,714.89	\$0.00	\$276,793.07	\$0.00 \$223,928.6		<b>.</b>	#0.00					00.00
20119 20119: Meade County 9 20121 20121: Miami County 2		\$569,400.41 \$264,187.86	\$542,029.41 \$264,187.86	\$27,371.00 \$0.00				\$49,082.10	\$0.00	\$36,661.84 \$192,263.64	\$0.00 \$0.00		\$91,615.40 \$27,371.0	\$105,706.32	\$0.00			\$100,536.36 \$71,924.22	\$0.00 \$20,006.5 \$0.00	1 \$0.00	\$58,795.05	\$0.00 \$79,625.83	\$0.00				\$0.00 \$0.0
20123 20123: Mitchell County 6		\$1,280,811.25	\$1,280,811.25	\$0.00	\$431,206.65 \$0.00	\$82,153.51 \$0.00		0001					\$44,817.41 \$0.0	0					\$653,414.2	5 \$0.00	\$5,663.85	\$0.00 \$63,555.58	\$0.00				
20125 20125: Montgomery 2 20127 20127: Morris County 7		\$986,408.69 \$974,531.67	\$986,408.69 \$974,531.67	\$0.00 \$0.00				\$334,803.22 \$121,055.61	\$0.00 \$0.00		\$0.00							\$651,605.47 \$564,225.15	\$0.00 \$0.00 \$142,774.1	6 \$0.00				\$0.00	\$0.00 \$0.00	\$0.00 \$0.00	\$0.00
20129 20129: Morton County 3	•	\$133,689.39	\$133,689.39	\$0.00	\$0.00									\$133,689.39	\$0.00				\$0.0	0 \$0.00							
20131 20131: Nemaha County 3 20133 20133: Neosho County 5		\$978,590.48 \$637,670.21	\$978,590.48 \$637,670.21	\$0.00 \$0.00						\$270,115.72 \$128,611.21	\$0.00 \$0.00			\$50,467.73	\$0.00		\$70,973.20 \$0.00	\$641,813.20 \$387,618.07	\$0.00 \$66,661.5 \$0.00	6 \$0.00					\$0.00	\$0.00	
20135 20135: Ness County 6	•	\$91,574.39	\$91,574.39	\$0.00			\$30,148.28 \$0.0	\$14,417.95	\$0.00				\$0.00 \$0.0	0				\$0.00	\$0.00 \$47,008.1	-	\$0.00	\$0.00					
20137 20137: Norton County 3 20139 20139: Osage County 5		\$5,559,413.33 \$1,973,496.18	\$5,559,413.33 \$1,973,496.18	\$0.00 \$0.00	\$35,889.44 \$0.00		\$84,626.45 \$0.00			\$442,124.59	\$109,763.93 \$0.00	\$0.00		\$4,809,561.23	\$0.00			\$1,119,445.57	\$640,088.1 \$0.00	7 \$0.00				\$291,410.13	\$0.00		
20141 20141: Osborne County 5	;	\$528,941.11	\$528,941.11	\$0.00	\$148,549.16 \$0.00		\$22,250.39 \$0.00											\$173,246.34	\$0.00 \$184,895.2								
20143 20143: Ottawa County 7 20145 20145: Pawnee County 1		\$1,416,777.03 \$735,839.89	\$1,416,777.03 \$735,839.89	\$0.00 \$0.00	\$412,974.00 \$0.00		\$46,144.79 \$0.00	\$473,109.25 \$0.00	\$0.00 \$0.00		\$0.00		\$210,621.32 \$0.0	0			\$131,007.31 \$0.00	\$335,423.98 \$234,277.82	\$0.00 \$57,381.4 \$0.00 \$172,324.7		\$0.00	\$0.00 \$0.00	\$0.00	\$6,881.07 \$0.00	\$0.00 \$0.00	\$0.00 \$0.00	\$0.00 \$0.00 \$0.00 \$0.0
20147 20147: Phillips County 6		\$322,425.77	\$322,425.77	\$0.00			\$28,699.09 \$0.00	)			\$98,782.89	\$0.00	40.0					\$120,189.74	\$0.00 \$0.0	0 \$0.00	\$0.00	\$0.00 \$74,754.05					40.0
20149 20149: Pottawatomie 5 20151 20151: Pratt County 7		\$2,559,458.17 \$2,464,476.83	\$2,559,458.17 \$1,303,096.02 \$	\$0.00 51,161,380.81	\$295,356.42 \$0.00	\$179,008.33 \$0.00	\$46,984.95 \$0.00	\$123,628.74	\$0.00	\$425,404.82	\$0.00		\$80,942.03 \$0.0	0		\$408,998.98	\$0.00 \$172,839.21 \$3,349.0	\$1,697,466.25 \$290,693.78 \$1,158,	\$0.00 \$141,230.6 031.76	8 \$0.00					\$0.00	\$0.00	
20153 20153: Rawlins County 2		\$14,533.96	\$14,533.96	\$0.00			40.0		, , , ,				<b>40.0</b>	\$14,533.96	\$0.00	, , , , , , ,						\$0.00	\$0.00				
20155 20155: Reno County 6 20157 20157: Republic County 4		\$3,333,030.69 \$413,250.04	\$3,333,030.69 \$413,250.04	\$0.00 \$0.00	\$157,191.09 \$0.00	\$344,356.15 \$0.00		\$519,807.00 \$56,782.15	\$0.00 \$0.00		\$0.00						\$270,027.03 \$0.00	\$2,096,536.55	\$0.00 \$102,303.9 \$0.0							\$0.00	\$0.00
20159 20159: Rice County 1	0	\$3,575,688.26	\$3,359,678.26	\$216,010.00		\$75,698.22 \$14,251.00	\$33,342.31 \$0.0		\$201,759.00		\$0.00		\$61,728.78 \$0.0	0		\$34,795.00		\$2,389,846.56	\$0.00 \$4,988.2	1 \$0.00		\$166,967.00	\$0.00				
20161 20161: Riley County 4 20163 20163: Rooks County 5		\$4,433,458.82 \$216,759.73	\$4,105,381.42 \$216,759.73	\$328,077.40 \$0.00	\$395,014.00 \$0.00 \$34,170.75 \$0.00		\$20,538.72 \$0.00	)			\$162,050.26	\$0.00				\$1,693,670.19	\$328,077.40	\$661,099.75	\$0.00 \$1,355,597.4 \$0.0		\$0.00	\$0.00					
20165 20165: Rush County 8	1	\$1,421,868.63	\$1,421,868.63	\$0.00	\$55,067.57 \$0.00	\$0.00 \$0.00	\$24,145.44 \$0.0						\$0.00 \$0.0					\$1,054,474.79	\$0.00 \$288,180.8	3 \$0.00	\$0.00	\$0.00					\$0.00
20167 20167: Russell County 9 20169 20169: Saline County 3		\$1,291,310.02 \$4,244,010.71	\$1,291,310.02 \$3,909,706.71	\$0.00 \$334,304.00	\$45,498.95 \$0.00	\$0.00 \$0.00	\$6,779.58 \$0.00	\$106.295.47	\$334,304.00		\$71,664.73	\$0.00	\$64,952.67 \$0.0	0				\$155,753.90 \$1,767,517.91	\$0.00 \$946,660.1 \$0.00 \$2,035,893.3			\$0.00	\$0.00			\$0.00	\$0.00
20171 20171: Scott County 6		\$5,200,253.63	\$5,200,253.63	\$0.00		\$122,170.52 \$0.00		\$100,293.47						\$4,233,040.22	\$0.00			, , , , , , , , , , , , , , , , , , , ,	\$720,510.7			\$23,047.31	\$0.00				\$0.00 \$0.0
20173 20173: Sedgwick County 2 20175 20175: Seward County 2		\$3,468,107.02 \$949,578.74	\$2,789,886.02 \$949,578.74	\$678,221.00 \$0.00		\$1,687,609.74 \$678,221.00					\$1,102,276.28	\$0.00	\$877,200.64 \$0.0	0 \$72,378.10	\$0.00												
20177 20177: Shawnee County 2	2	\$5,441.02	\$5,441.02	\$0.00															\$5,441.0					\$0.00	\$0.00		
20179 20179: Sheridan County 3 20181 20181: Sherman County 2		\$17,023.23 \$59,849.16	\$17,023.23 \$59,849.16	\$0.00 \$0.00	\$59,849.16 \$0.00								\$0.00 \$0.0	0 \$17,023.23 \$0.00	\$0.00 \$0.00				\$0.0	0 \$0.00							
20183 20183: Smith County 4	L	\$1,003,077.75	\$1,003,077.75	\$0.00	\$666,353.91 \$0.00		\$21,267.72 \$0.00	)										\$315,456.12	\$0.00 \$0.0								
20185 20185: Stafford County 1		\$548,116.74 \$77,158,53	\$174,381.74 \$77,158.53	\$373,735.00 \$0.00	\$0.00 \$373,735.00 \$0.00 \$0.00	\$19,561.99 \$0.00	\$32,203.64 \$0.0	)					\$98,909.89 \$0.0	0 \$77,158.53	\$0.00			\$23,706.22	\$0.00 \$0.0 \$0.0		\$0.00	\$0.00 \$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
20187 20187: Stanton County 3 20189 20189: Stevens County 3		\$77,158.53 \$133,823.98	\$77,158.53 \$133,823.98	\$0.00 \$0.00	φυ.υυ φυ.υυ					\$23,012.06	\$0.00			\$77,158.53 \$110,811.92	\$0.00 \$0.00				\$0.0 \$0.0								
20191 20191: Sumner County 7	•	\$2,734,937.92	\$2,720,147.92	\$14,790.00		\$89,024.07 \$0.00		\$128,346.98	\$0.00		\$0.00 \$796,770.48	\$0.00					\$178,305.72 \$14,790.00	\$1,201,946.49	\$0.00 \$28,139.8	2 \$0.00			40				<b>#</b> 2 22
20193 20193: Thomas County 3 20195 20195: Trego County 8		\$9,089.17 \$7,015,277.51	\$9,089.17 \$7,015,277.51	\$0.00 \$0.00		\$23,448.68 \$0.00							\$0.00 \$0.0	\$9,089.17 0 \$4,585,321.72	\$0.00 \$0.00			\$83,623.44	\$0.00 \$1,190,543.7	3 \$0.00	\$1,089,521.10	\$0.00 \$0.00 \$42,818.84		\$0.00	\$0.00		\$0.00 \$0.0
20197 20197: Wabaunsee 6	•	\$835,353.86	\$835,353.86	\$0.00						\$265,250.77	\$0.00							\$546,353.09	\$0.00 \$23,750.0	0 \$0.00				\$0.00	\$0.00	\$0.00	\$0.00 \$0.00 \$0.0
20199 20199: Wallace County 6 20201 20201: wasnington 5		\$41,373.91 \$2,116,253.51	\$41,373.91 \$2,116,253.51	\$0.00 \$0.00				\$24,196.40	\$0.00	\$806,711.94	\$0.00			\$0.00	\$0.00			\$0.00 \$707,091.83	\$0.00 \$41,373.9 \$0.00 \$30,144.8	1 \$0.00 7 \$0.00	\$0.00	\$0.00 \$0.00	\$0.00				\$0.00 \$0.0
20203 20203: Wichita County 3		\$66,445.51	\$66,445.51	\$0.00										\$28,538.42	\$0.00				\$37,907.0			\$0.00	\$0.00				
20205 20205: Wilson County 3 20207 20207: Woodson County 5		\$277,422.90 \$338,271.00	\$277,422.90 \$338,271.00	\$0.00 \$0.00				\$33,633.50 \$766.69	\$0.00 \$0.00		\$61,892,96	\$0.00						\$243,789.40 \$275,611.35	\$0.00 \$0.00			\$0.00	\$0.00		\$0.00 \$0.00	\$0.00 \$0.00	
20209 20209: Wyandotte County 6		\$5,868,527.93	\$5,868,527.93	\$0.00	\$667,126.96 \$0.	0.00		Ţ. 00.00	Ţ0.00		Ţ3.,30 <u>2</u> .00	75.00			\$2,098,918.91 \$0.00			\$2,117,355.42	\$0.00 \$985,126.6	4 \$0.00		\$0.00			45.00	\$0.00	
otal Total 2	20	\$225,635,532.13	\$214,758,712.83 \$1	0,876,819.30	\$7,283,728.87 \$593,687.00 \$2,900,592.12 \$23,894.	1.00 \$4,883,032.82 \$726,334.00 \$1	,320,792.96 \$140,026.0	\$7,624,476.38	\$1,518,773.00	\$10,965,009.42 \$965	5,725.21 \$5,798,145.11	\$61,295.18 \$	\$12,565,373.45 \$88,152.4	0 \$62,692,064.23 \$	\$2,506,854.04 \$5,685,114.52 \$58,043.96	\$4,066,807.07	\$378,116.55 \$3,501,859.85 \$132,475.14	4 \$61,886,847.29 \$3,305,	696.35 \$15,862,278.2	7 \$50,875.00	\$2,056,049.77	\$19,185.00 \$3,810,980.25	\$147,682.50	\$720,363.60 \$	28,399.97 \$378,398.95 \$90	096.00 \$378.398.95 \$41.	,508.00 \$378,398.95 \$0.0

#### **APPENDIX**

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#### **DATA VISUALIZATION TOOLS**

It is evident the U.S. is already paying a steep price for this challenge. Rebuild by Design partnered with APTIM and iParametrics to create the following visual tools to demonstrate how climate events have affected each state. The set of six maps depicts which areas have been hit the hardest by recent climate events, where recovery funds are focused, where those individuals with high social vulnerabilities live, and which areas have the least energy reliability.

The U.S. needs to change the way it is making funding decisions. Where we make priority investments is equally important to what we invest in. Returns on investments (ROI) in the form of social benefits to communities needs to be part of grant evaluations. The U.S. need to utilize new decision-making frameworks that are forward-looking. The final map in the set includes an example of a new decisionmaking framework that takes into account current vulnerabilities and future climate risks. This is one example of how physical and social vulnerability indicators could inform where investments in adaptation infrastructure can yield high returns in social benefits to the most impacted communities. Our team recognizes, however, that there are other decision-making frameworks to explore, and further research is needed to understand which indicators should be included in any state-specific model. Given the ever-present constraints on funding availability, the intent of presenting these maps together is to prompt investments that address multiple known vulnerabilities simultaneously within projects, furthering comprehensive climate adaptation planning.

The following data are designed as a tool to help communities understand their risks to make better-informed choices with higher returns on investment, though each state should determine their own framework for investment.

There are always many ways to present these data. For the purposes of this report, we chose to analyze the years 2011–2024. The following six maps and two tables are presented in this format with the following considerations and limitations:

#### **GEOGRAPHIC MAP**

The map provides topographic and geographic context for each state and its surrounding areas, indicating whether the state encompasses coastal, riverine, lake, alpine, or desert land.

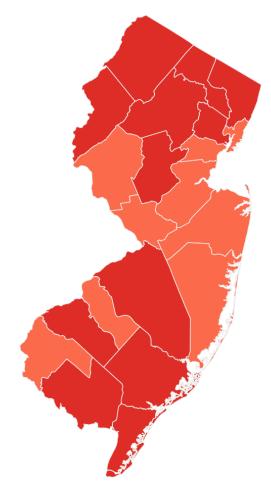


GEOGRAPHIC MAP. SOURCE: ESRI WORLD IMAGERY BASEMAP

#### **DISASTER DECLARATIONS (RED)**

This map shows federally declared climate disasters by county from 2011-2024 – providing a snapshot of the magnitude of climate disasters across the country in recent history. This report only identifies federally declared disasters, as there is no entity that collects and publishes state disaster declarations. It should be noted that the declarations shown in this report do not reflect every climate event that has occurred between 2011-2024; the report instead only shows those which have met the cost threshold for a federal disaster declaration. Therefore, the findings overall underestimate the number of occurrences and the suffering that some communities have experienced.

According to the Stafford Act, as amended in May 2021, a "major disaster" includes "any natural catastrophe (including any hurricane, tornado, storm, high water, winddriven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, or drought), or, regardless of cause, any fire, flood,



DISASTER OCCURRENCES SOURCE: FEMA 2011-2024 MAP MADE BY REBUILD BY DESIGN

or explosion, in any part of the United States, which in the determination of the President causes damage of sufficient severity and magnitude to warrant major disaster assistance under this Act to supplement the efforts and available resources of States, local governments, and disaster relief organizations in alleviating the damage, loss, hardship, or suffering caused thereby."

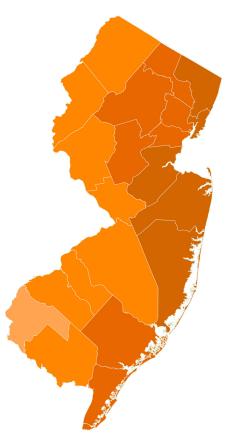
Importantly, extreme heat waves do not fit the criteria for federal disaster declarations despite being the leading cause of deaths among climate hazards. Likewise, sea level rise is not included in this definition despite the threat it poses to numerous communities, including damage to property, loss of land, and displacement.

It should be noted that while most disaster declarations are due to climate events, there are a few instances of disasters due to other natural hazards, such as earthquakes and volcanic eruptions. Though these events are not increasing in magnitude or frequency due to climate change, the severity of their impact may be connected. As climate impacts degrade household and critical infrastructure, communities may become more vulnerable to other natural hazards. Retrofitting infrastructure after these events often requires the same measures as floods, tornadoes, fires, etc., so these events were included in the report to demonstrate the need to prioritize multi hazard adaptation approaches.

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#### FEDERAL ASSISTANCE (ORANGE)

The map shows the amount of federal dollars allocated to counties through FEMA's Public Assistance and Hazard Mitigation Grant Programs between 2011-2024 which allocates funding to individual counties and statewide. The map does not show where "statewide" allocations were spent within the state, but rather only shows county allocations. However, these statewide allocation amounts are included in the Disaster Declaration table at the end of each chapter and included in the "FEMA Total" provided next to the map. The adjacent table adds HUD's Community Development Block Grant Disaster Recovery funds – which are only available to states after a disaster – to the FEMA Total for an estimate of federal post-disaster spending in each state.



FEDERAL ASSISTANCE SOURCE: FEMA (HA+PM) 2011-2024 MAP MADE BY REBUILD BY DESIGN

The Disaster Declaration tables provided at the end of each chapter show all federal Disaster Declarations declared between 2011-2024 and the corresponding FEMA obligations associated with those events.

However, in some instances, FEMA continues to obligate funds for years following a declaration. Some states have received funds for events that took place

between 2011-2024 after 2024, so the total sum of funds associated with that event are not captured. All FEMA funds allocated to counties between 2011-2024 are shown in the federal assistance map; however, they do not show up in the Disaster Declaration table if their corresponding event took place prior to 2011. For example, counties in the State of Illinois are still receiving funds from a 1960s storm. The funds obligated to those counties are included in the map, but that event is not included in the Disaster Declaration table at the end of the chapter.

There are additional sources of federal funding made available to governments or individuals in response to disasters, such as the U.S. Army Corp of Engineers (USACE) projects, Small Business Administration (SBA) loans, and private insurance payouts, which are not included in this report because they are harder to uniformly track and/or must be paid back. Therefore, our findings underestimate the total support available to states and individuals post-disaster.

Since disaster aid is allocated to repair physical damage to property, events such as extreme heat, which largely creates physical damage to persons and not property, rarely qualify for federal disaster recovery aid. Additionally, there is only a shallow understanding of the economic impact of social and health-related costs and environmental degradation after a disaster.

#### **SOCIAL VULNERABILITY INDEX (GREEN)**

Social vulnerability refers to the potential negative effects on communities caused by external stresses on human well-being. Such stresses include natural or human-caused disasters or disease outbreaks. The factors that determine social vulnerability are directly tied to social determinants of health or the social, economic, and physical factors - such as race, socioeconomic status, and environmental conditions - that influence health. Socially vulnerable populations fare the worst during a disaster and often take longer to recover. The Center for Disease Control/ Agency for Toxic Substance and Disease Registry Social Vulnerability Index (CDC/ATSDR SVI) uses 15 U.S. census variables to help local officials identify communities that may need support before, during, or after disasters. The map presents the SVI on a census block



SOCIAL VULNERABILITY SOURCE: CDC/ATSDR 2022 MAP MADE BY REBUILD BY DESIGN

level, indicating where the most socially vulnerable populations within each county live. The 15 indicators are grouped into four themes:

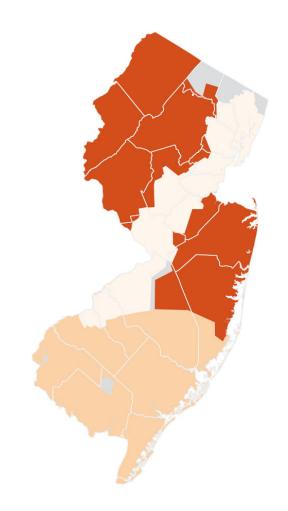
- Socioeconomic Status (below poverty, unemployed, income, no high school diploma);
- Household Composition & Disability (aged 65 or older, aged 17 or younger, older than age 5 with a disability, single-parent households);
- Minority Status & Language (minority, speak English "less than well"); and
- Housing Type & Transportation (multi-unit structures, mobile homes, crowding, no vehicle, group quarters).

Social Vulnerability Index data are not being used to make post-disaster assistance funding decisions. HUD only requires Low and Moderate Income for a portion of their funding. FEMA does not consider it in their allocations.

#### **ENERGY RELIABILITY (BROWN)**

Climate events often lead to energy disruptions for hours, days, or weeks. This map shows the annual average interruption time (in minutes) across the different energy utility providers within a state. Regions (or utility territories) in the darkest shade, on average, experience longer energy outages. These data are aggregated by utility territory, not county, meaning more than one provider can serve a county or group of counties.

Viewing the Energy Reliability Map next to the SVI Map, one can begin to infer which regions have the most socially vulnerable residents and are served by the least reliable energy providers. Energy reliability is increasingly becoming related to climate disasters and weather events. Inclusion of these maps is to support evaluation of need for concurrent flood and energy resilience projects.



ENERGY RELIABILITY SOURCE: US ENERGY INFORMATION ADMINISTRATION 2023 MAP MADE BY REBUILD BY DESIGN

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#### System Average Interruption Duration Index (SAIDI)

is one of the performance metrics used to measure the reliability of an electric utility's service. This metric measures the total time (in minutes) an average customer experiences a non-momentary power interruption over a one-year (calendar) period.

A Major Event Day (MED) is another metric which occurs when the SAIDI exceeds a specific threshold within a given day and tends to reflect outages on the longer end of the spectrum. The data presented in this report shows a metric of SAIDI combined with MED to highlight and report electric reliability in areas (utility territories) irrespective of the root cause of the interruption. The Energy Reliability Map displays the SAIDI\_W\_MED metric for utility territories and highlights areas that are susceptible to electric system vulnerabilities based on reliability performances. These vulnerabilities serve as an indicator as to where investments and improvements in the distribution grid should be focused.

Electric utilities experience power interruptions due to a variety of issues. Those issues include inclement weather, vegetation management practices, utility practices, maintenance patterns, and capital investment strategy, among others, which all play a part in a utility's overall reliability performance. The U.S. Energy Information Administration produces an Annual Electric Power Industry Report which utilizes data collected from U.S. electric utilities reflecting their reliability performance against certain industry standards and performance metrics. Utilities have the flexibility to report interruptions according to duration and frequency either with major events, without major events, or both.

The annual SAIDI is the summation of the individual SAIDIs for each non-momentary interruption event over the entire year (2023):

 $SAIDI = \frac{\sum (Duration of Interruption \times No. of Sustained Customer Interruptions)}{Total No. of Customers Served}$ 

For utilities that report SAIDI metrics using the Institute of Electrical and Electronics Engineers (IEEE) standards, "non-momentary" interruptions are those lasting

longer than five minutes. A Major Event Day (MED) is another metric which occurs when the SAIDI exceeds a specific threshold within a given day and tends to reflect outages on the longer end of the spectrum.

Utilities have certain flexibilities when reporting with these metrics. Including MED in the SAIDI metric (SAIDI\_W\_MED) provides an overall picture of the electric reliability experienced by customers. Excluding MED from the SAIDI metrics (SAIDI\_WO\_MED) tends to separate power interruption events by their durations, which provides an indicator of the source of the power interruption (i.e., distinguishes a Major Event vs. Systematic Operation interruption).

Our methodology utilizes SAIDI\_W\_MED as the primary measurement indicator for the electric reliability experience of the end user (customer). Our SAIDI\_W\_MED metric highlights the reported electric reliability in areas (utility territories, counties, and states) irrespective of the root cause of the interruption. Our metric does not exclude interruptions categorized as MEDs.

This report endeavors to highlight areas across the national electric distribution network (utility territories) that are susceptible to electric system vulnerabilities based on historical reliability of performance. We view vulnerabilities caused by major events (longer duration outages) on par with vulnerabilities caused by systematic failures (shorter duration outages) and believe they should equally drive electric grid investment and improvement decisions. These investments should also incorporate solutions aimed at mitigating systemic vulnerabilities that stem from issues like vegetation management practices, distribution automation improvements to major event vulnerabilities with root causes embedded in grid hardening, distribution generation schemes, and Automated Metering Infrastructure (AMI) upgrades aimed at minimizing customer interruption numbers and durations.

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