

NRECA Reliability Online Study

Survey Results

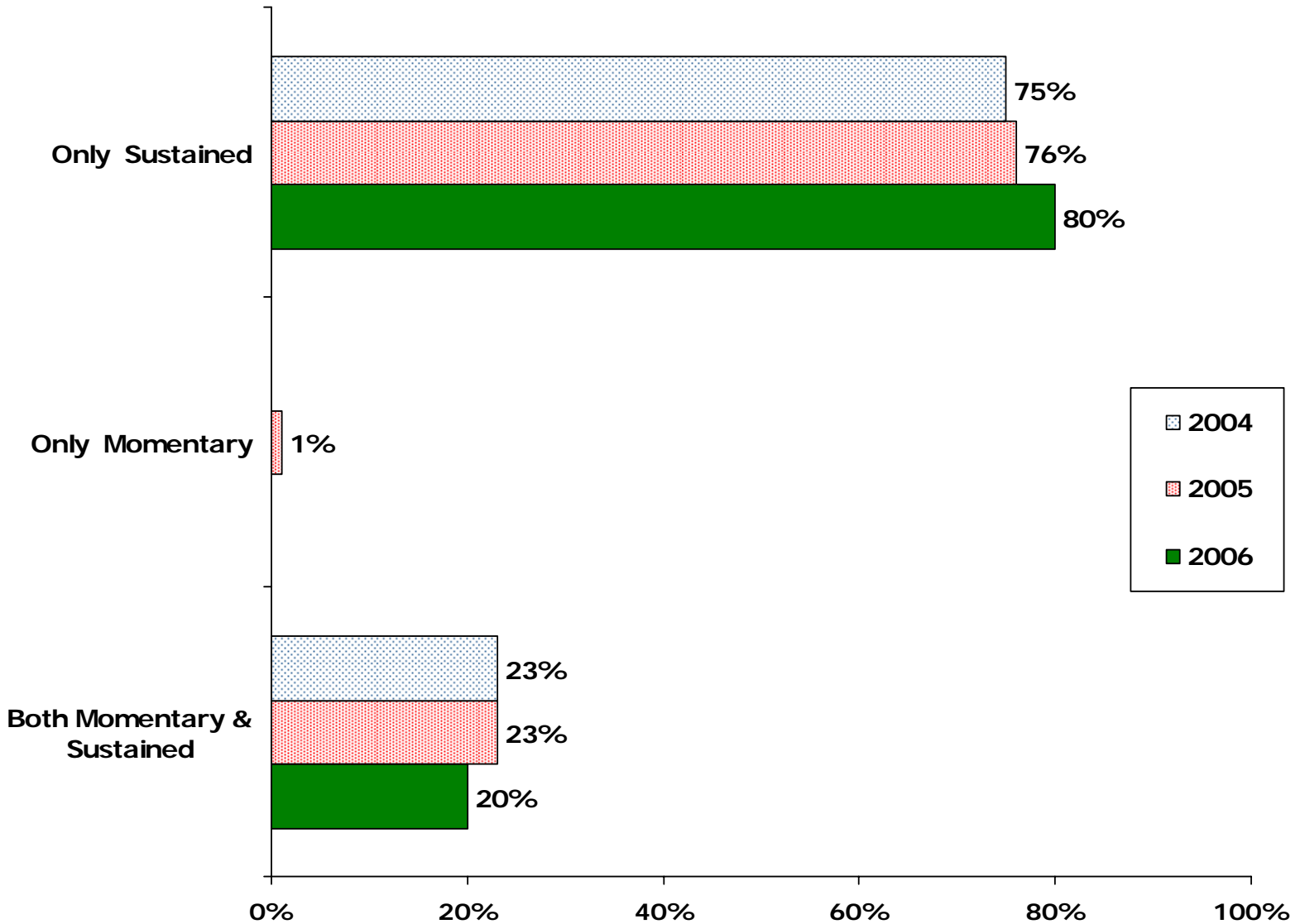
June, 2006

Methodology/Response Rate

- 262 respondents participated in the 2006 reliability study (compared to 231 in 2005 and 299 in 2004).
- As in the past years, the study was conducted online. For reporting purposes, percentages are based on total responding to that question.
- Notification was placed on Cooperative.com alerting CEOs and key staff that the study was being conducted.
- Overall response rate was 38.9%. (28% in 2005 and 36% in 2004). A total of 743 distribution cooperatives' key Engineering and Operations staff names were included in the initial sample (based on NRECA's database).
 - 70 email messages were returned undeliverable, making 673 the total number of respondents receiving an email invitation to participate.
 - Three reminder notifications were emailed to respondents asking for their participation.

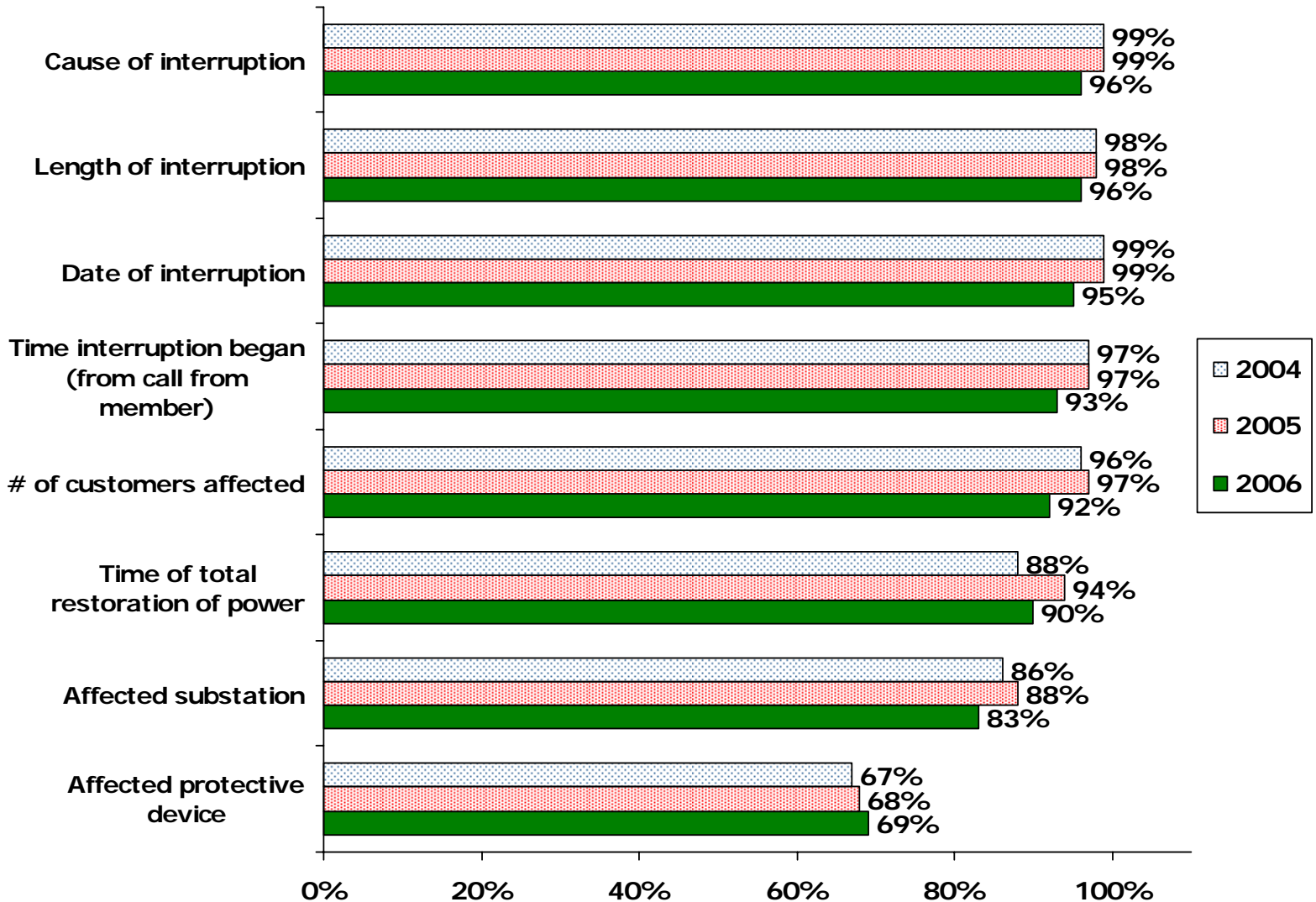
Outages -- Tracking

Interruption Types Tracked by Cooperative

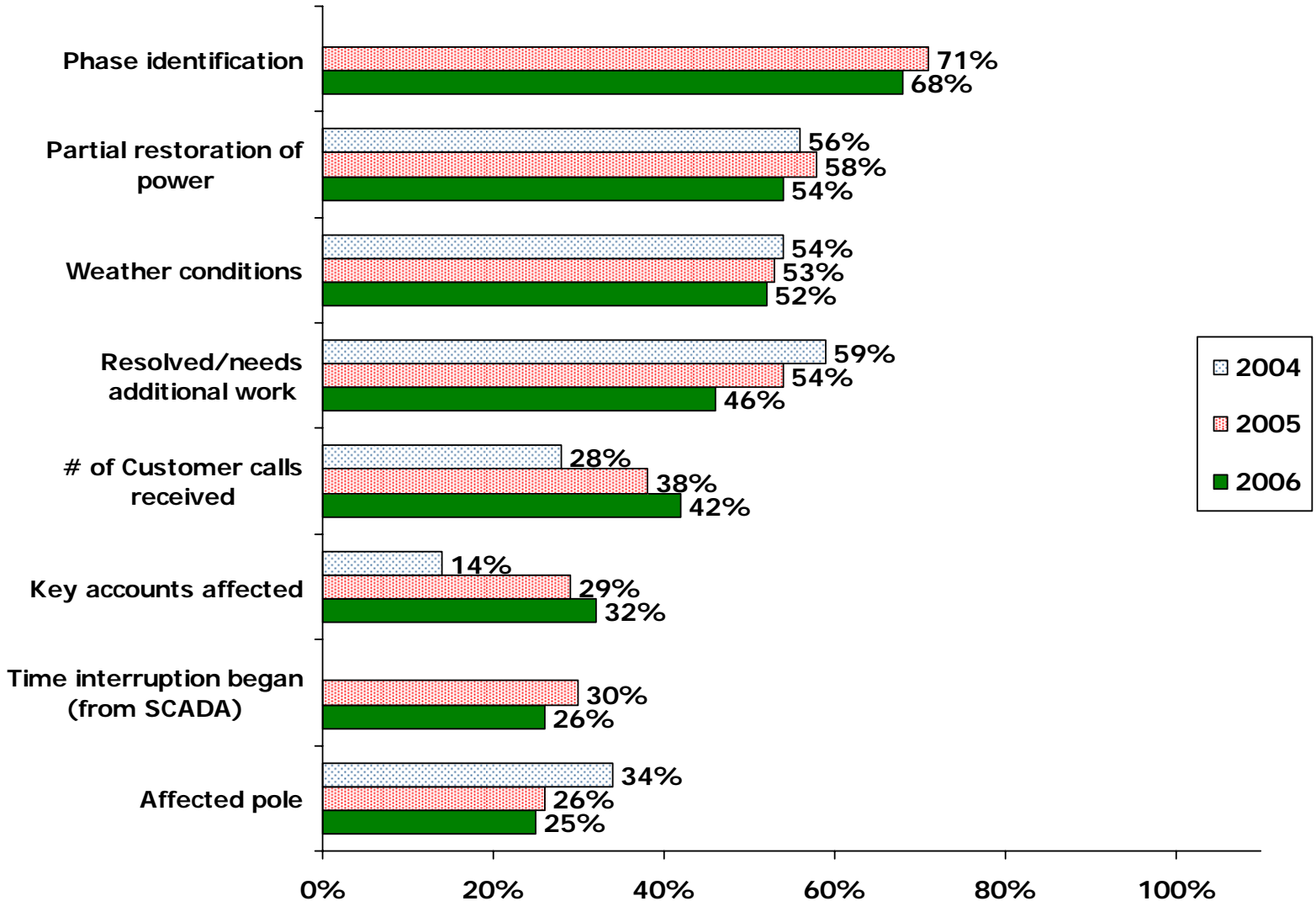


Information Recorded When Tracking Outages

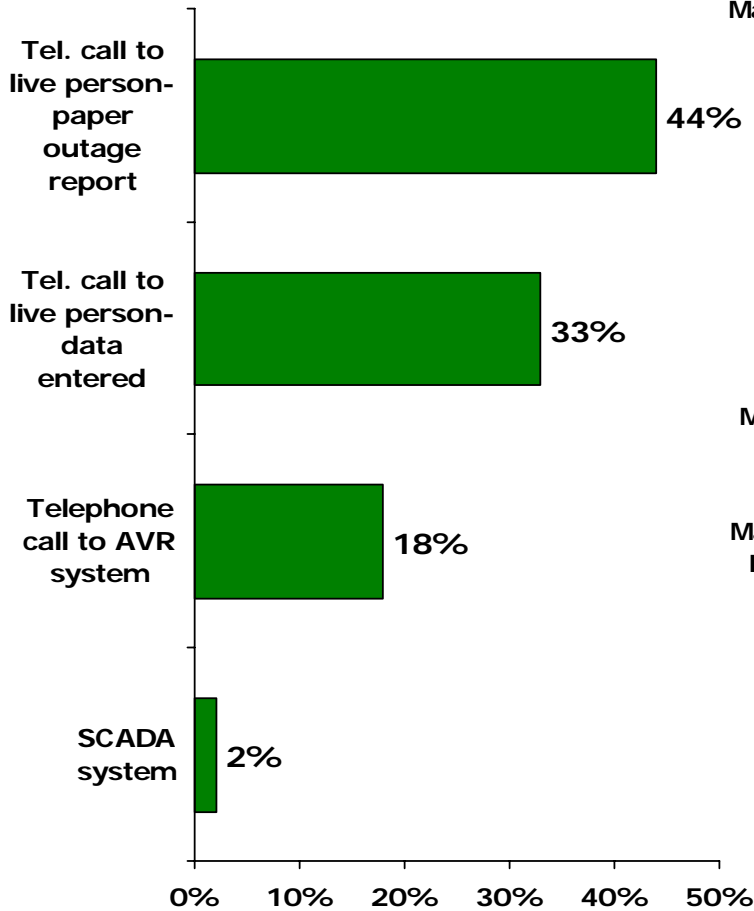
(Multiple Responses Possible) Top 8 Graphed



Information Recorded When Tracking Outages (Multiple Responses Possible) Bottom 8 Graphed

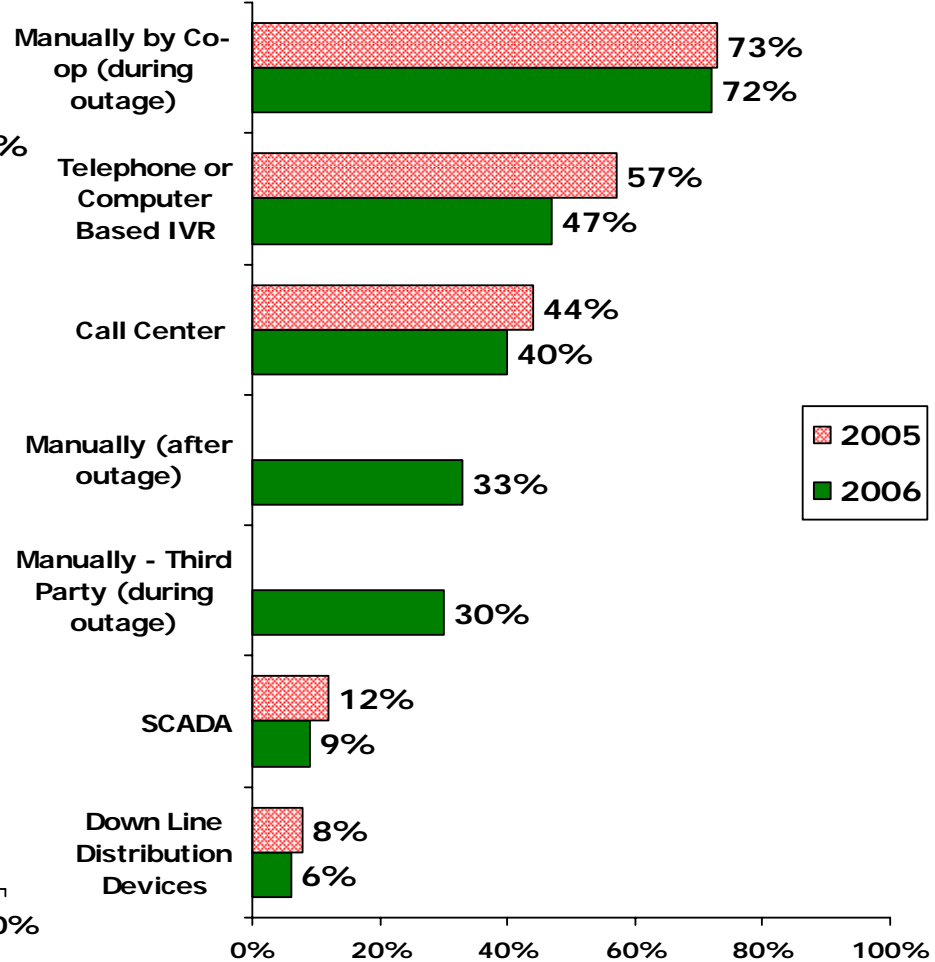


Primary Method of Receiving Outage Information



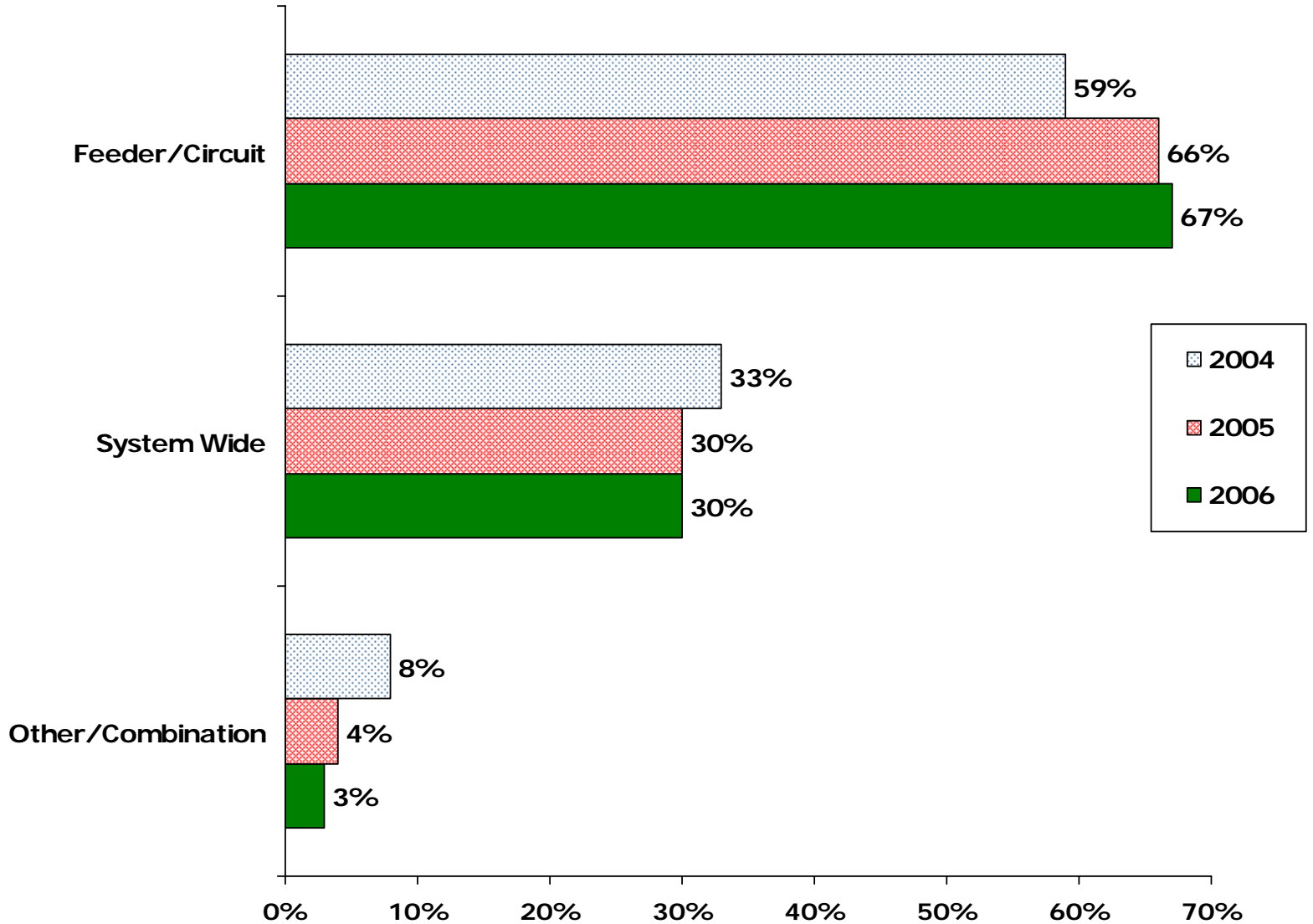
If Use OMS: Method by Which Interruptions Are Entered Into System

(Multiple Responses Possible)

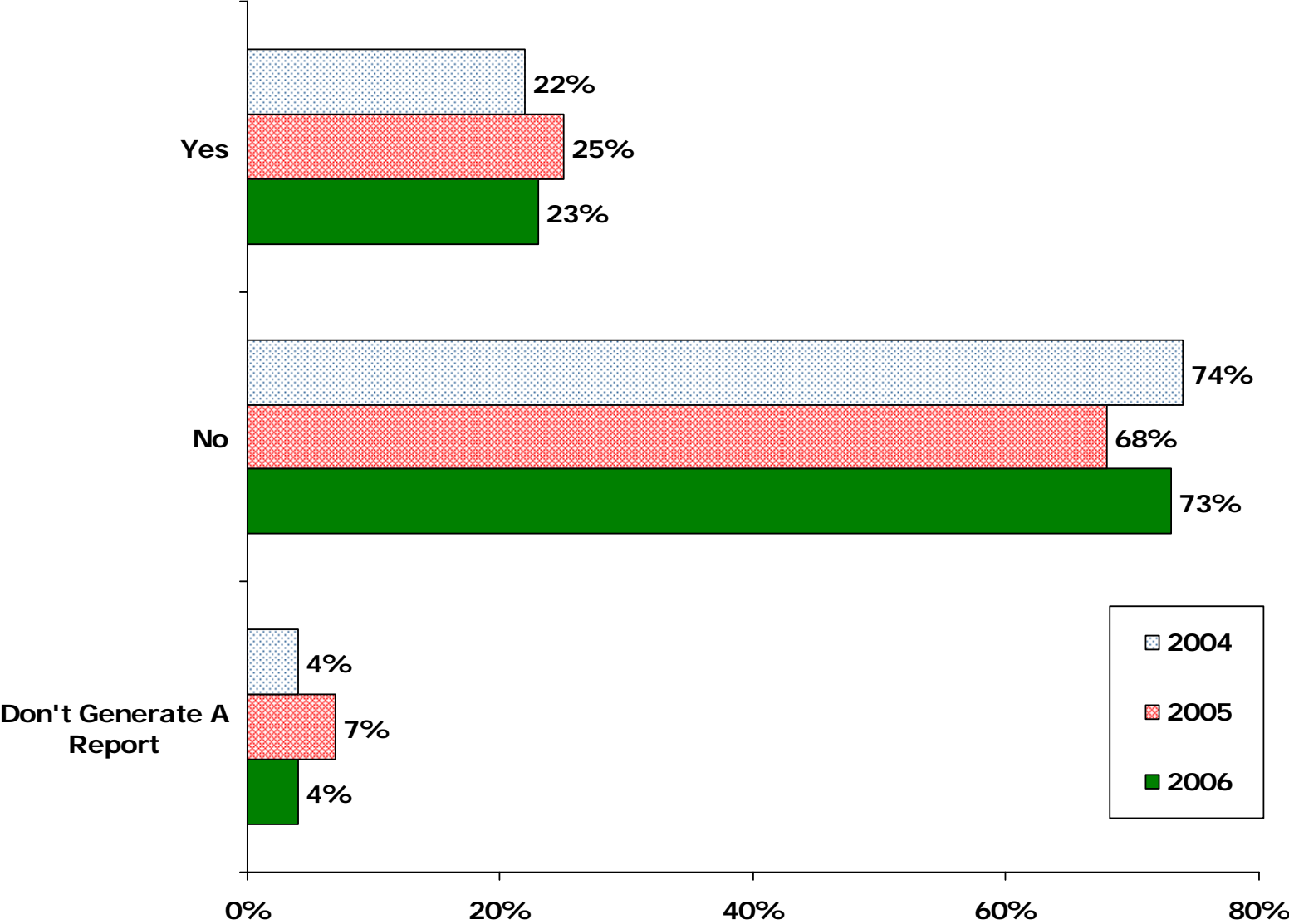


2005
2006

Interruption Tracking Method Used

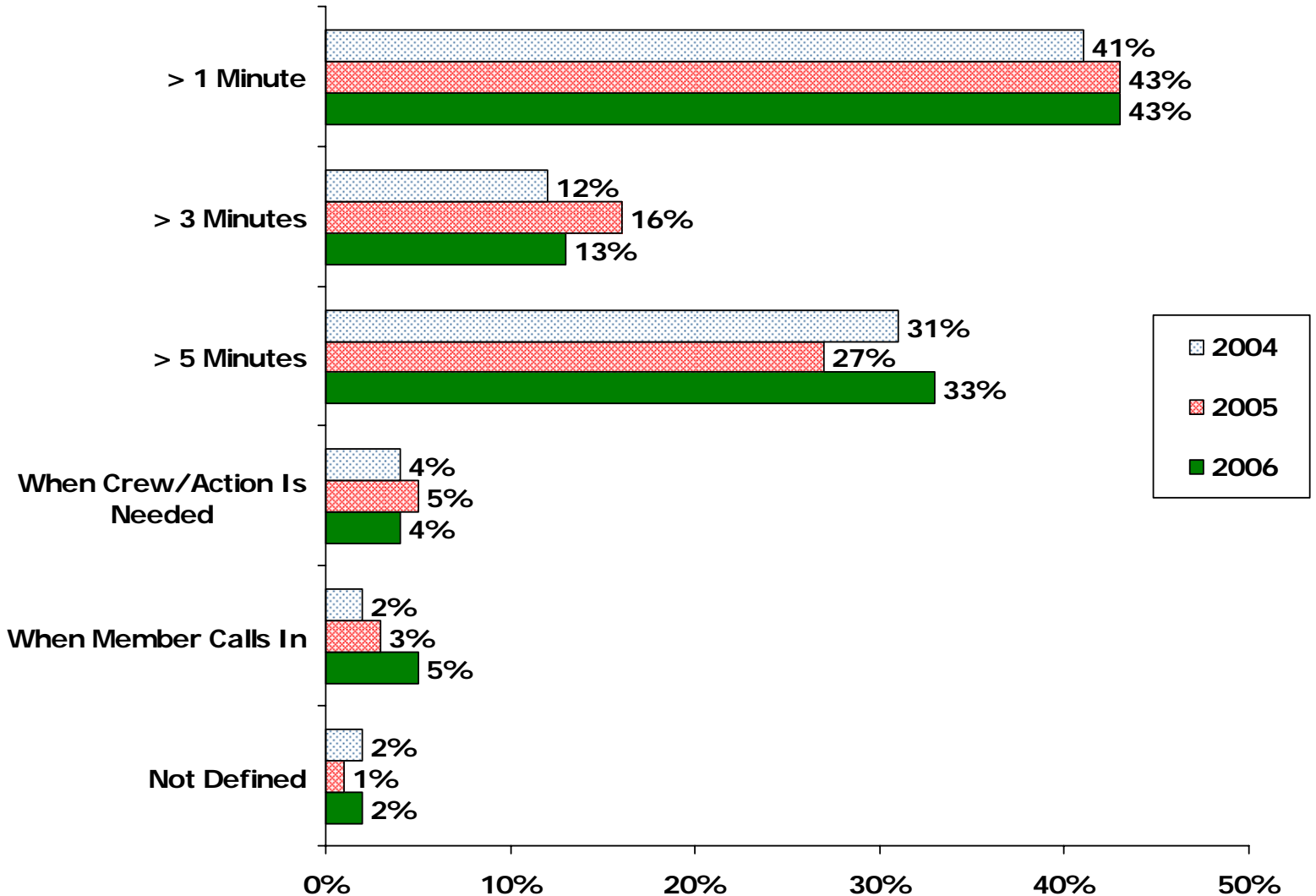


Co-op Publicizes Its Reliability Reports

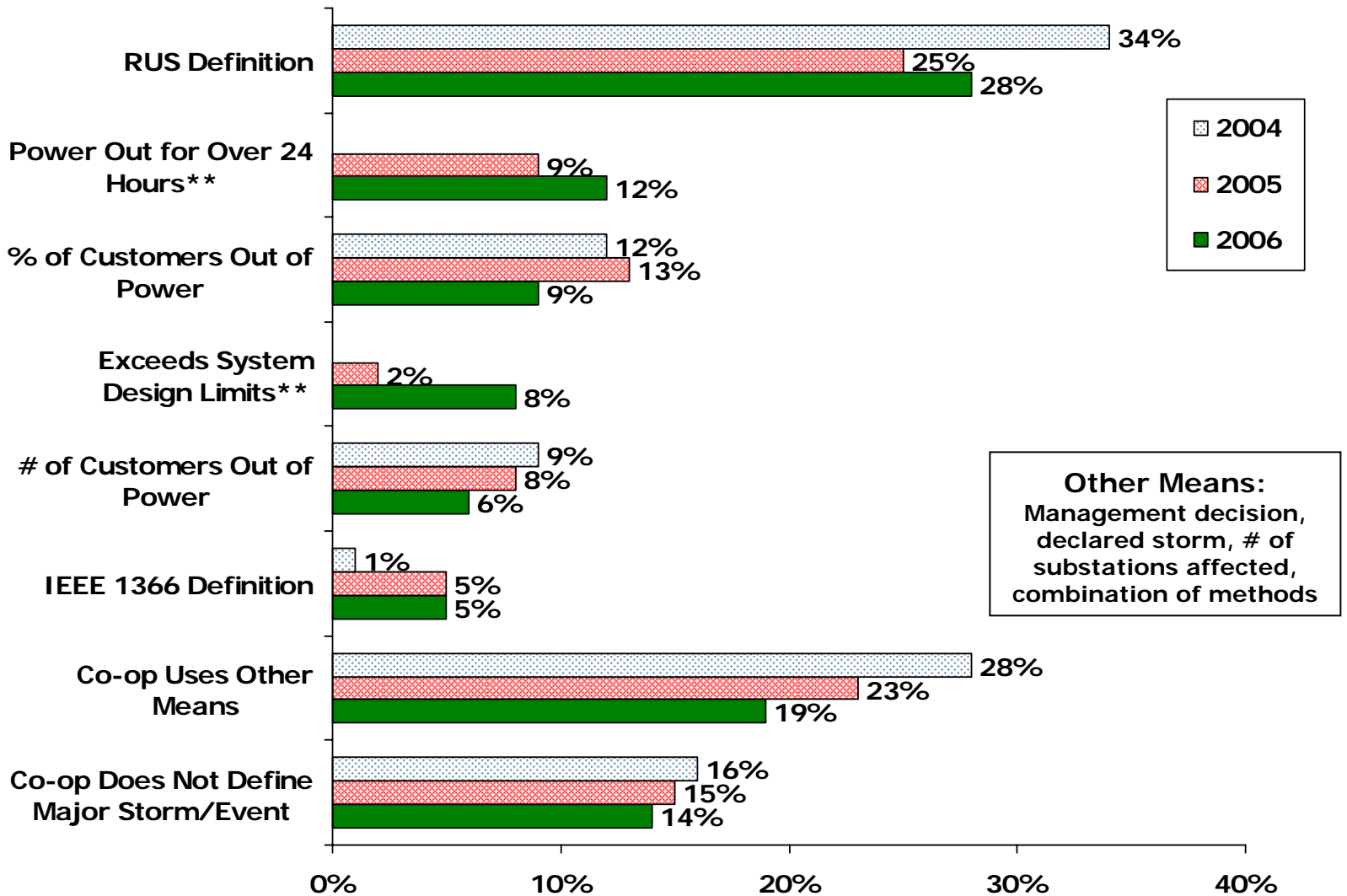


*Outages --
Sustained*

Co-op's Definition of Sustained Interruption in Terms of Time



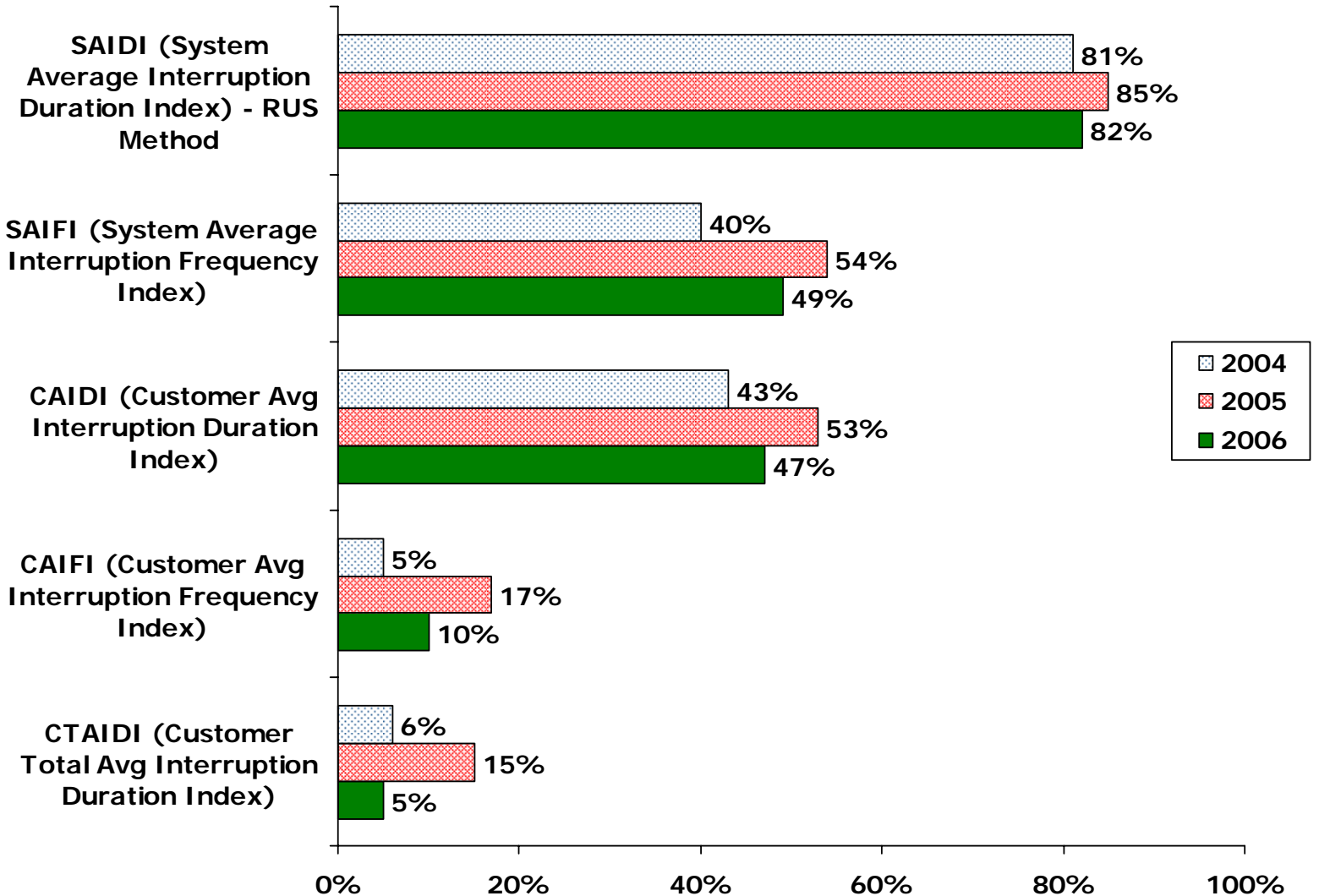
How Co-op Defines Major Storm or Major Event



Other Means:
 Management decision,
 declared storm,
 # of substations affected,
 combination of methods

** Not a choice in 2004

Indices Used To Track Co-op Statistics (Multiple Responses Possible)



Index Responses

SAIDI (System Average Interruption Duration Index – RUS Method)

	2006	2005	2004
# Reporting An Amount	160	156	176
Average # Minutes Reported	106.9	125.3	130.8
Breakout of Responses:			
50 minutes or less	45%	35%	15%
51 – 120 minutes	20%	30%	36%
121 – 180 minutes	16%	17%	22%
Over 180 minutes	19%	18%	15%
25 th Percentile	2.7 minutes		
Median	68.9 minutes		
75 th Percentile	158.1 minutes		

Index Responses

CAIDI (Customer Average Interruption Duration Index)

	2006	2005	2004
# Reporting An Amount	112	102	131
Average # Minutes Reported	116.1	184.3	119.1
Breakout of Responses:			
30 minutes or less	34%	26%	12%
31 – 60 minutes	6%	15%	12%
61 – 90 minutes	21%	17%	31%
91 - 120 minutes	18%	19%	18%
Over 120 minutes	20%	24%	17%
25 th Percentile	2.5 minutes		
Median	72.5 minutes		
75 th Percentile	112.3 minutes		

Index Responses

SAIFI (System Average Interruption Frequency Index)

	2006	2005	2004
# Reporting An Amount	125	112	126
Avg # Interruptions/Customer	6.96	15.00	6.66
Breakout of Responses:			
.10 interruptions or less	15%	15%	18%
.11 - 1.00 interruptions	25%	20%	26%
1.01 – 1.50 interruptions	18%	22%	22%
1.51 – 2.50 interruptions	26%	20%	17%
Over 2.50 interruptions	17%	23%	16%
25 th Percentile	0.69 interruptions		
Median	1.26 interruptions		
75 th Percentile	2.06 interruptions		

Index Responses

CTAIDI (Customer Total Average Interruption Duration Index)

	2006	2005	2004
# Reporting An Amount	25	28	25
Average # Minutes Reported	88.50	86.93	76.16
Breakout of Responses:			
10.0 minutes or less	48%	39%	24%
10.01 – 75.00 minutes	4%	4%	6%
75.01 – 125.0 minutes	24%	25%	20%
Over 125.0 minutes	24%	32%	24%
25 th Percentile	1.62 minutes		
Median	61.60 minutes		
75 th Percentile	126.28 minutes		

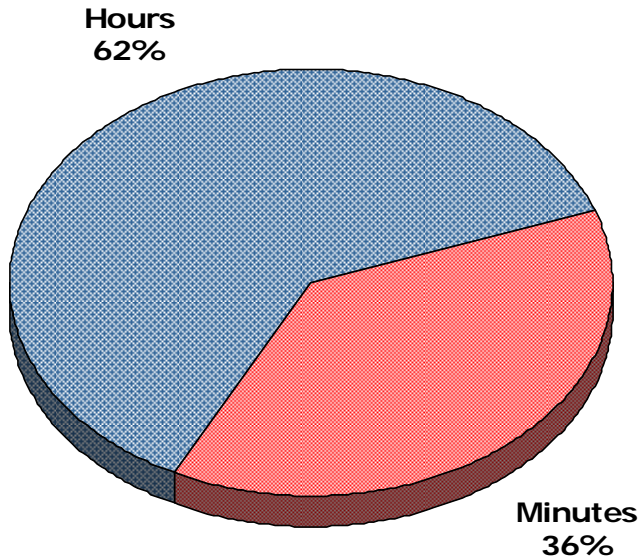
Index Responses

CAIFI (Customer Average Interruption Frequency Index)

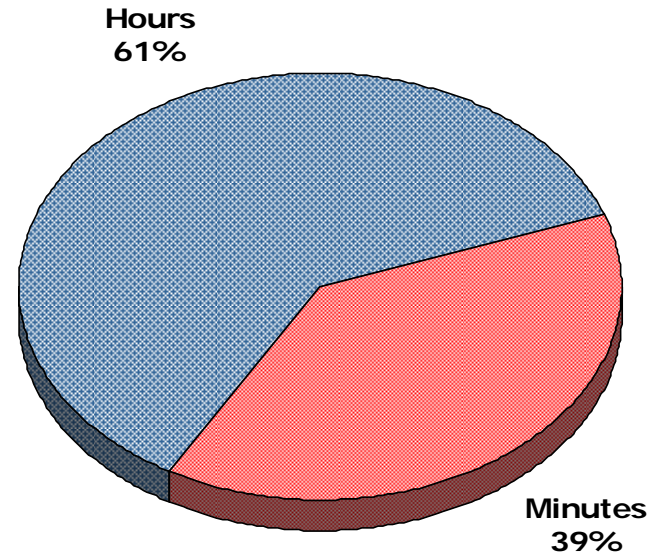
	2006	2005	2004
# Reporting An Amount	29	33	20
Average # Interruptions	0.80	5.18	0.46
Breakout of Responses:			
1.00 interruptions or less	61%	64%	80%
Over 1.00 interruptions	39%	36%	20%
25 th Percentile	0.03 interruptions		
Median	0.07 interruptions		
75 th Percentile	1.33 interruptions		

Report Interruptions in Minutes or Hours

2005

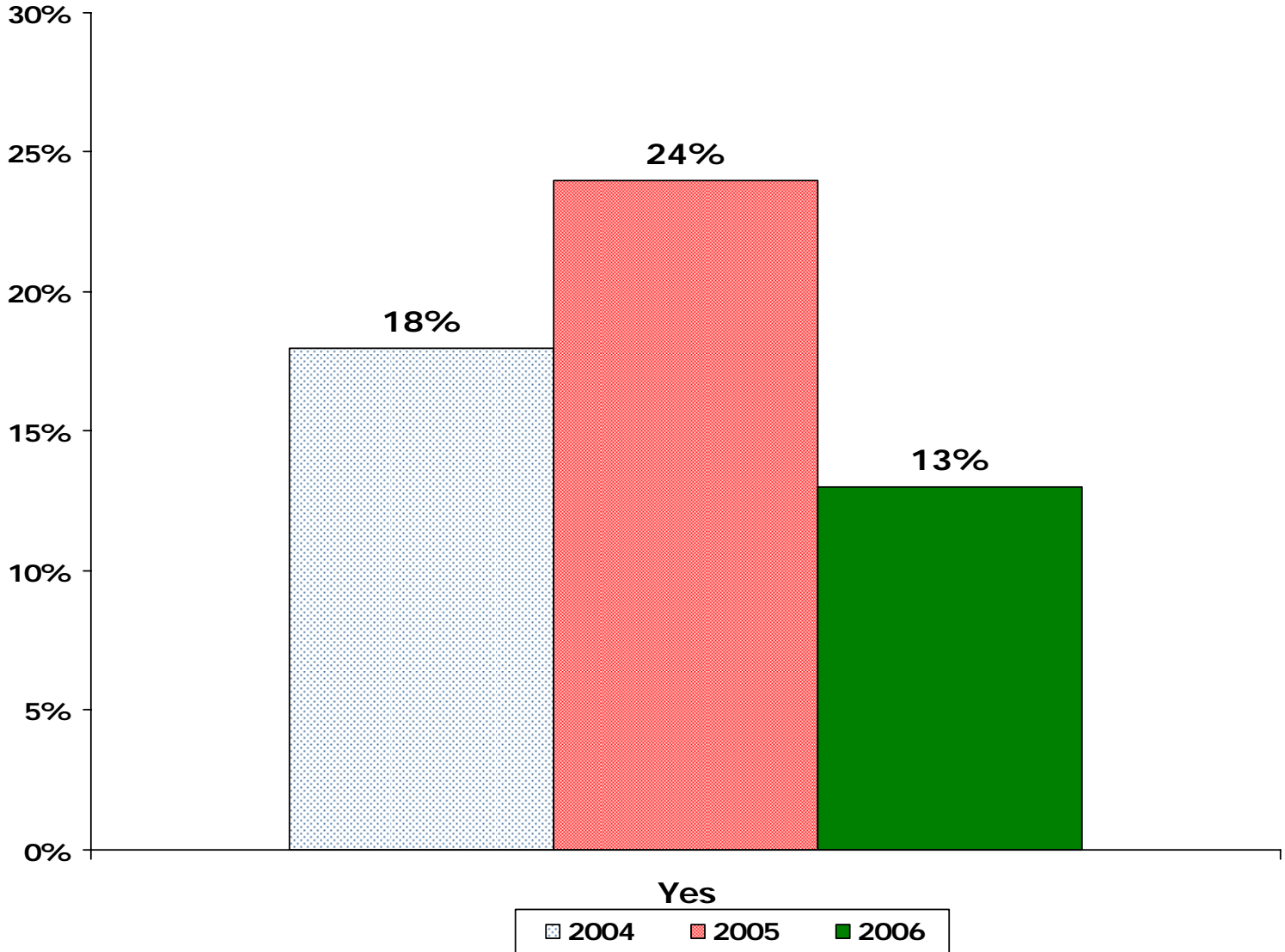


2006

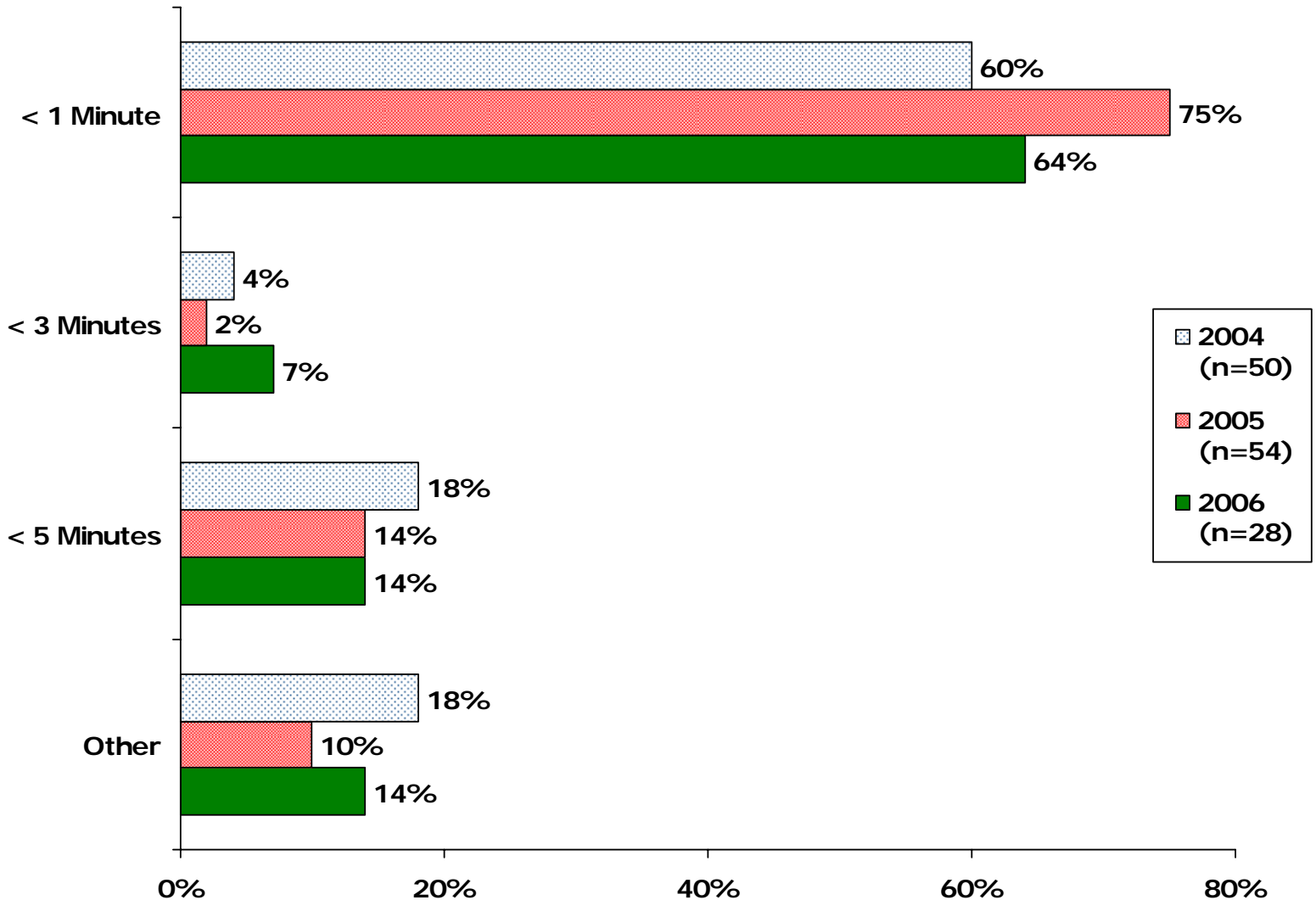


*Outages --
Momentary*

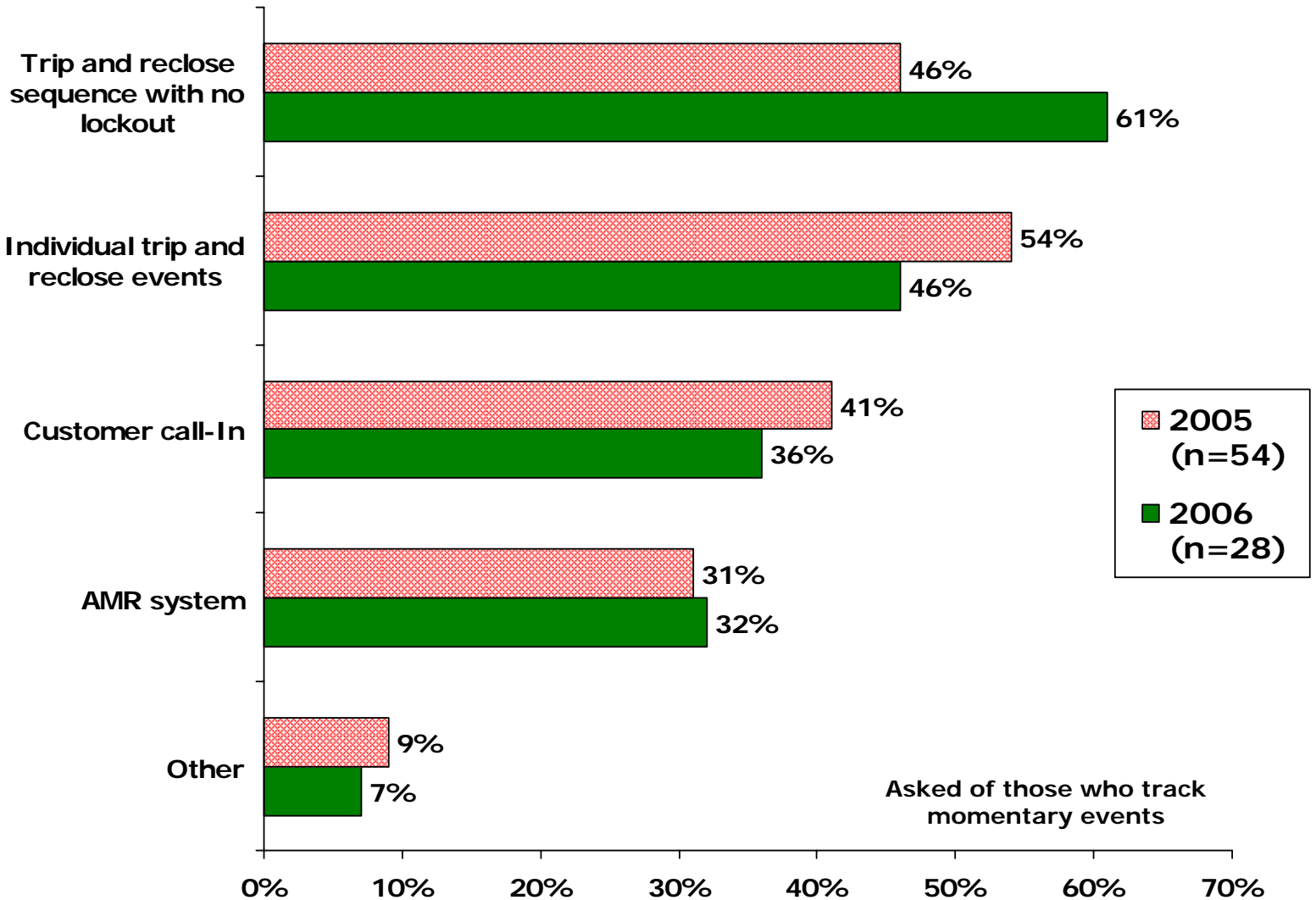
Co-op Track Momentary Interruptions



Co-op's Definition of Momentary Interruption in Terms of Time

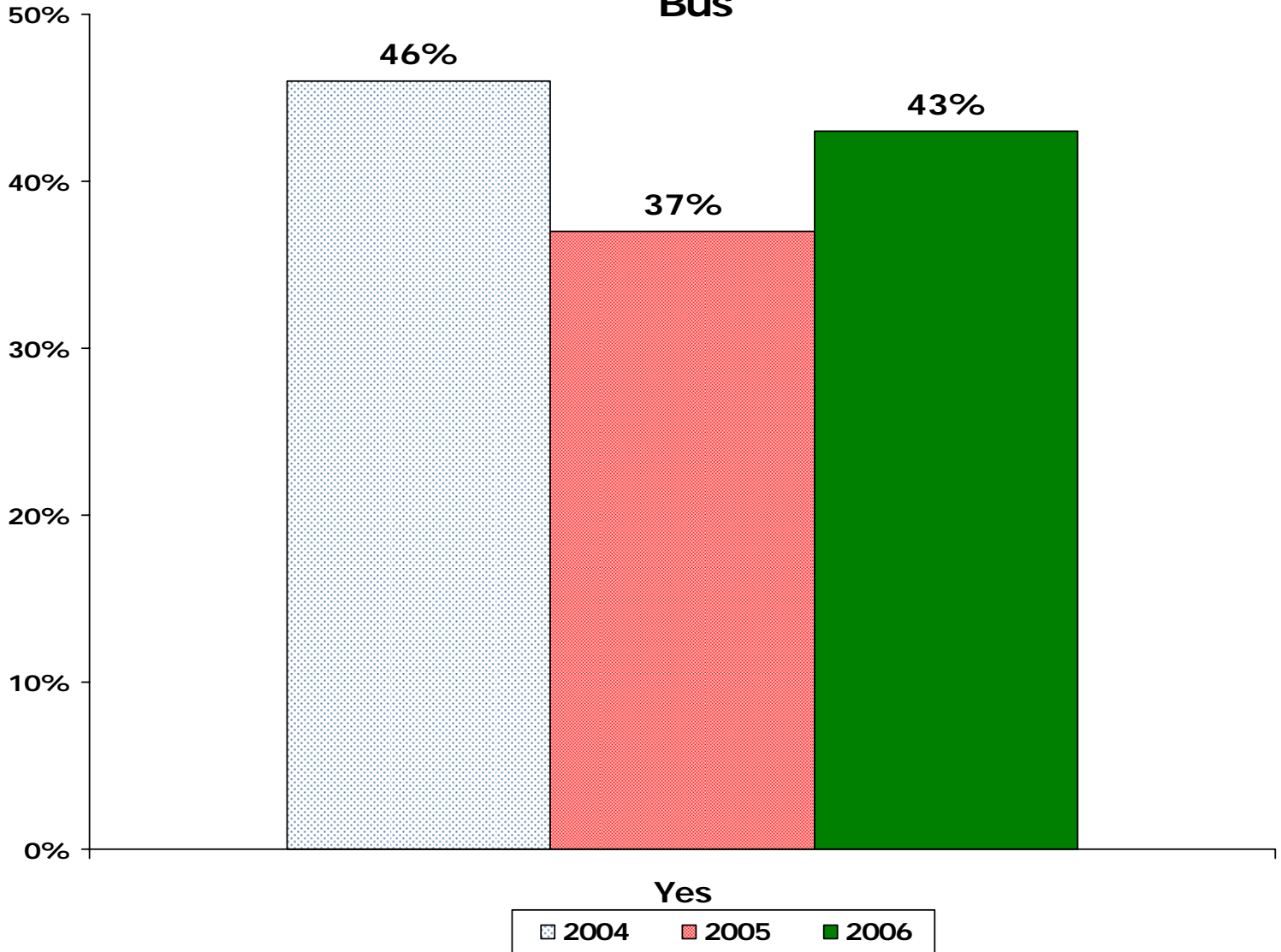


Co-op's Method of Capturing Momentary Events (Multiple Responses Possible)

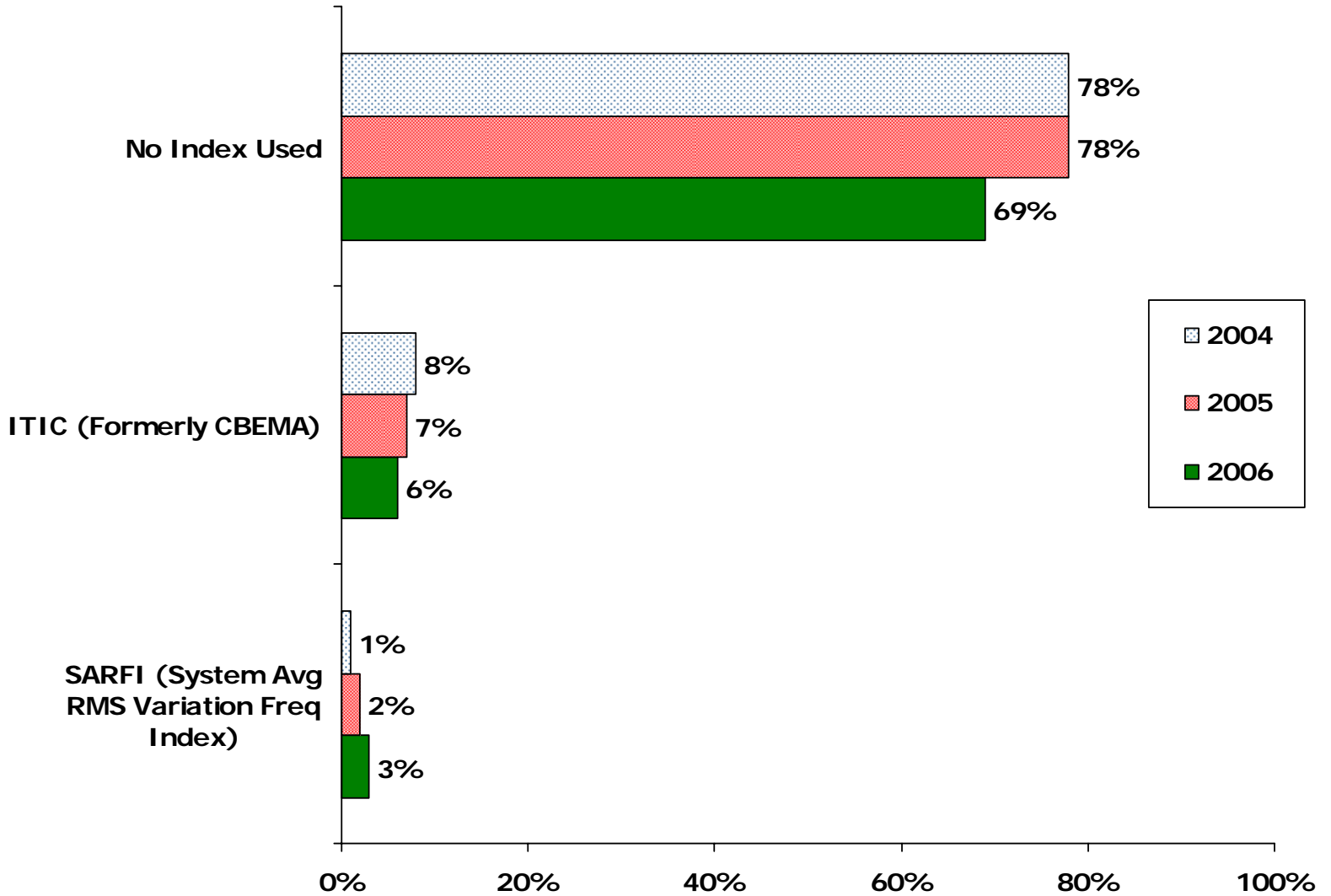


Power Quality

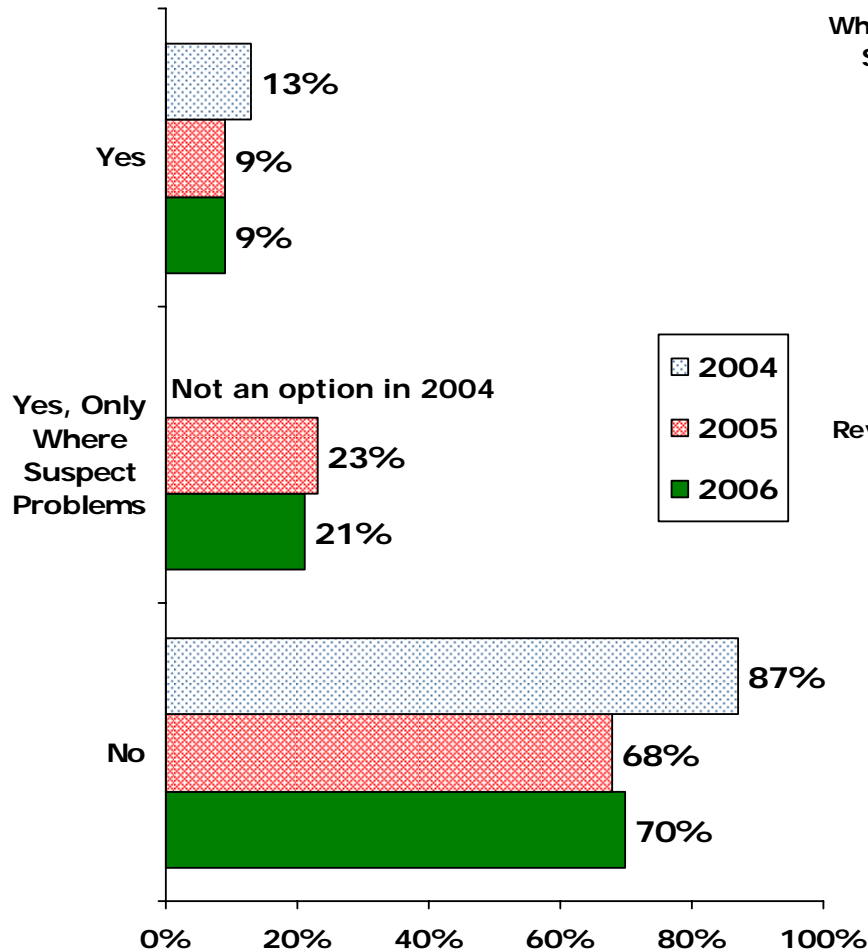
Co-op Records Voltage Deviations At Substation Bus



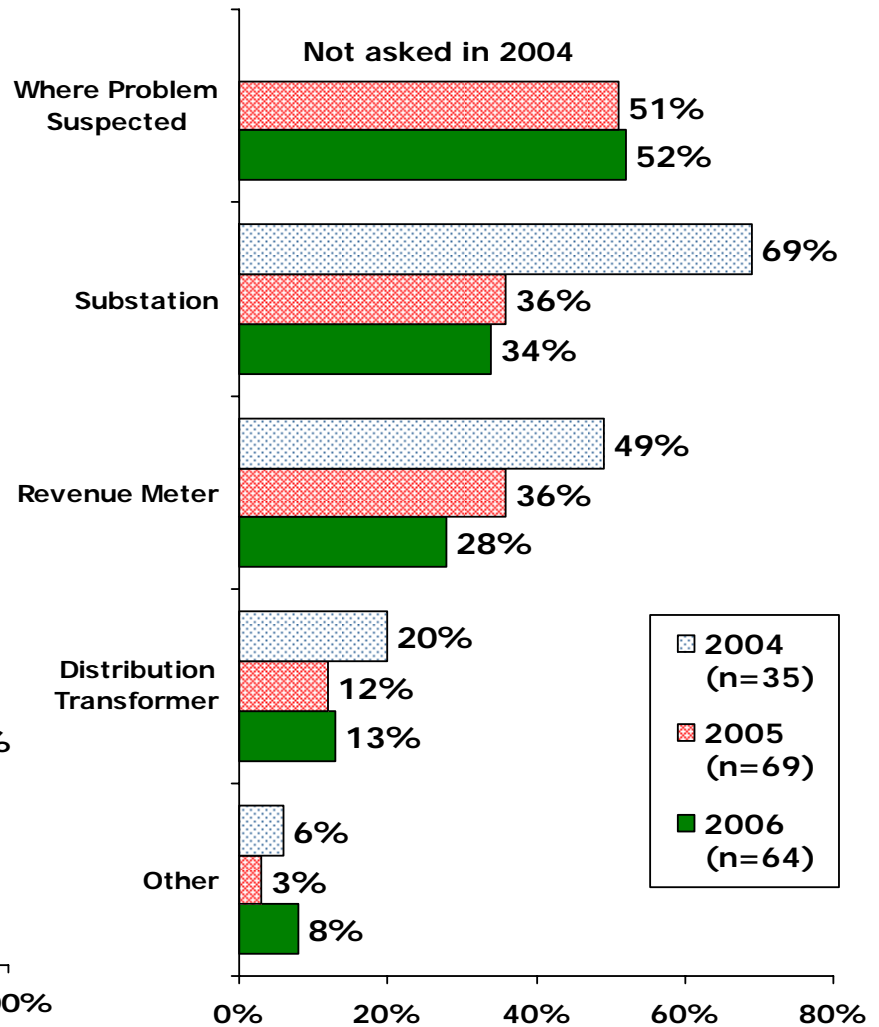
Indexing Methods Used (Multiple Responses Possible)



Regularly Record Total Harmonic Distortion (THD) Levels Anywhere on System

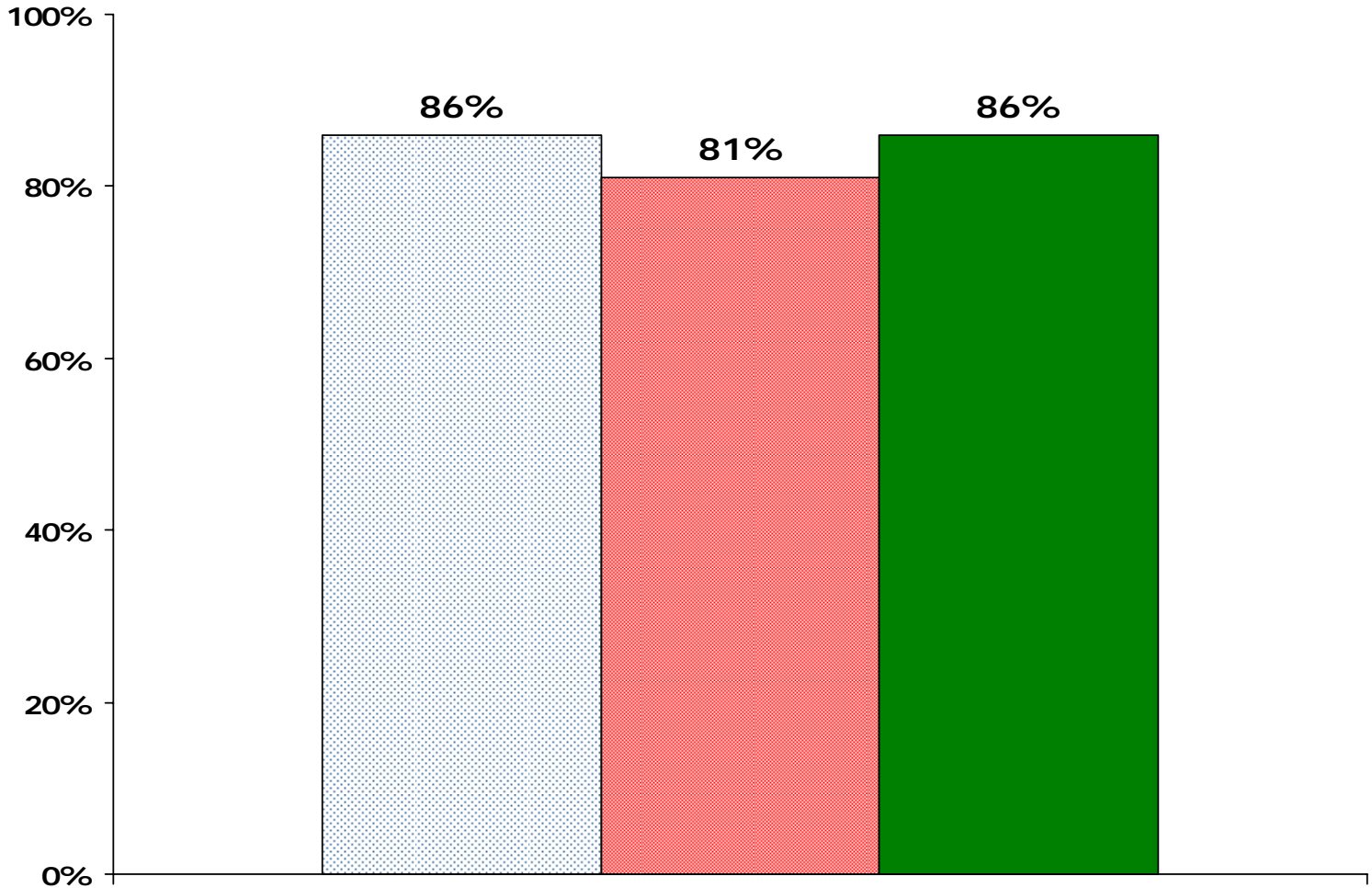


IF YES: Where? (Multiple Responses Possible)



*Power
Restoration
After an
Interruption*

Cooperative Has a Written Emergency Interruption Restoration Plan



Wording in 2004 – Co-op has major storm, event or catastrophe outage restoration plan

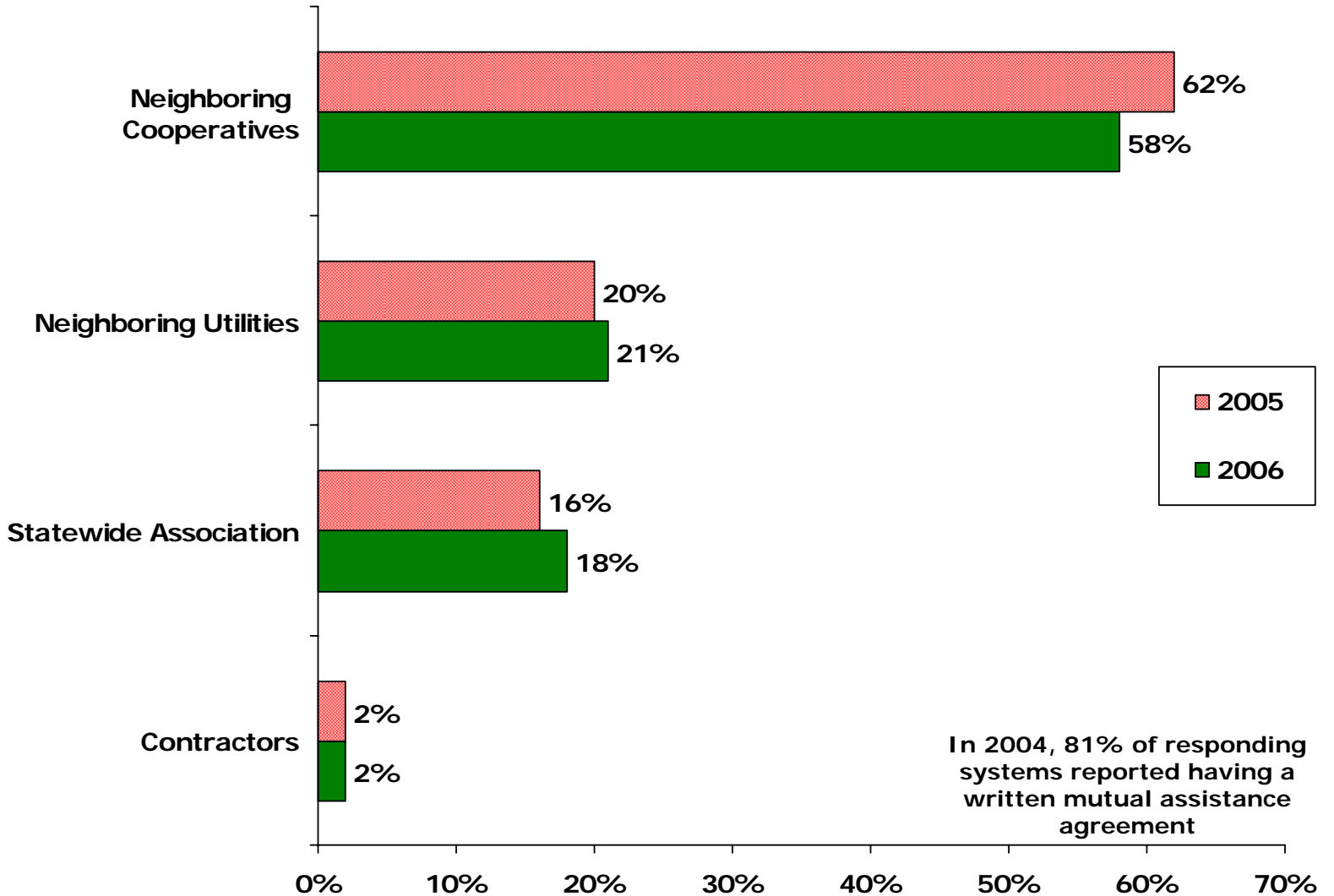
Yes

2004

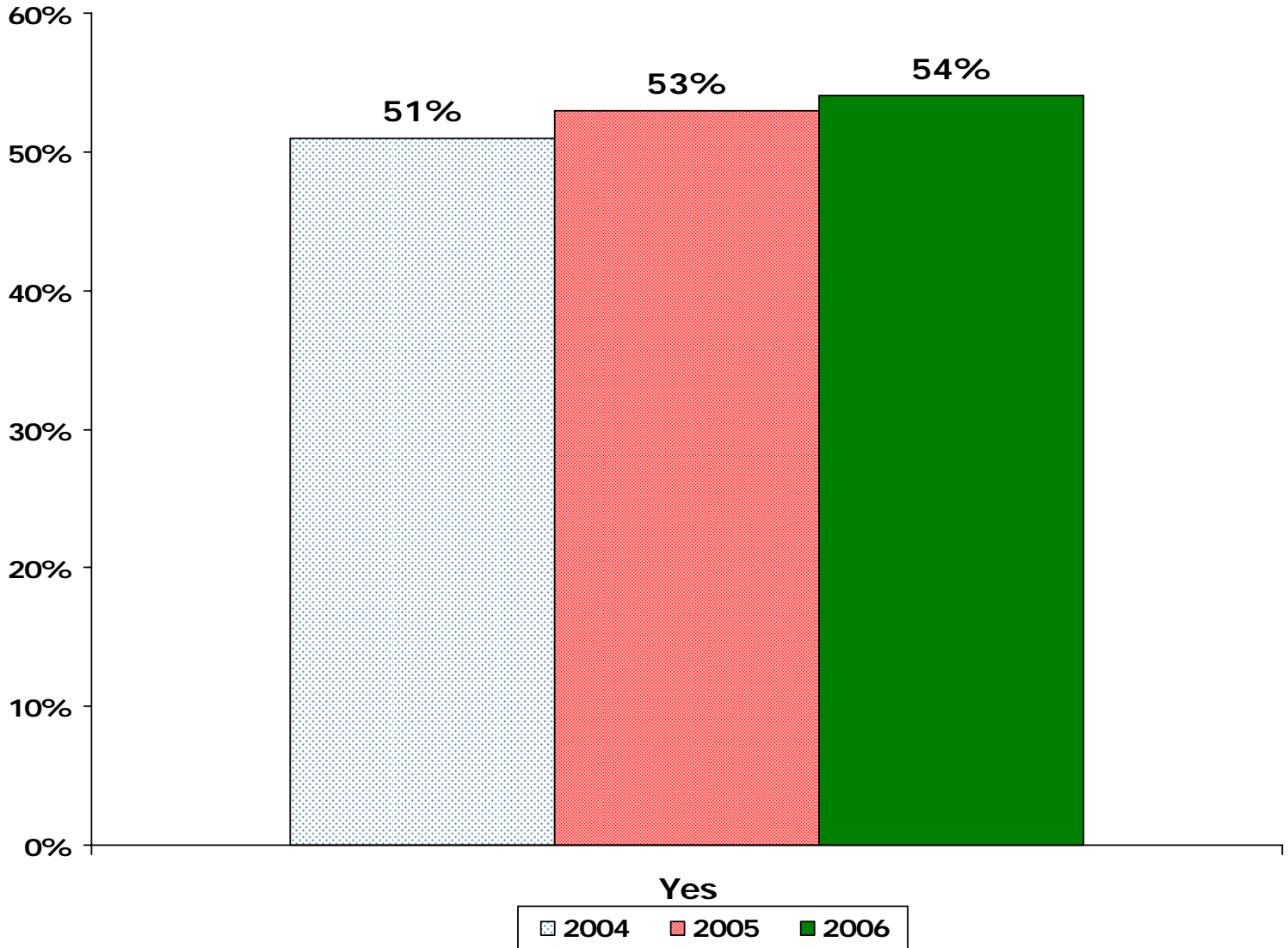
2005

2006

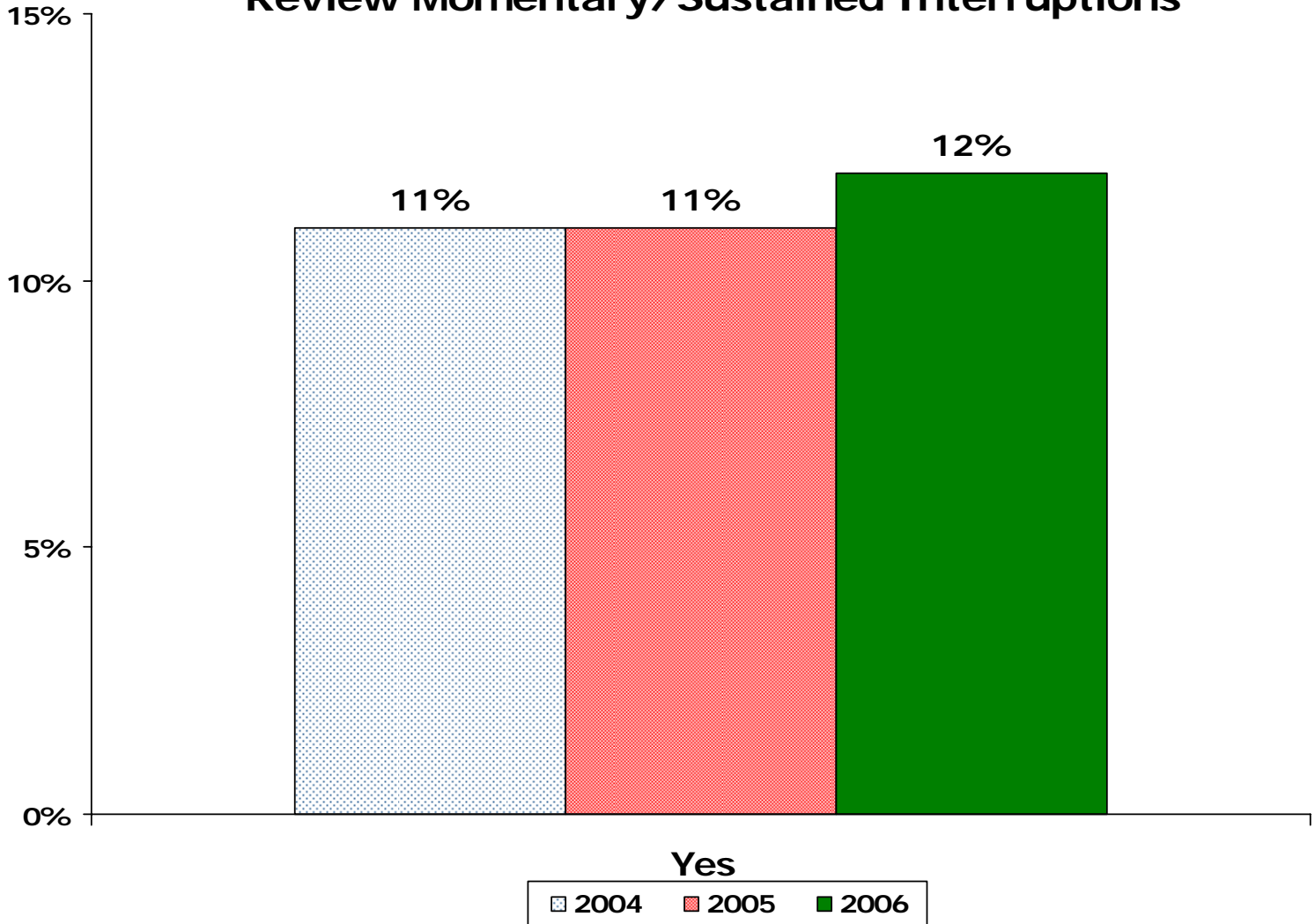
Co-op Has Written Mutual Assistance Agreement (Multiple Responses Possible)



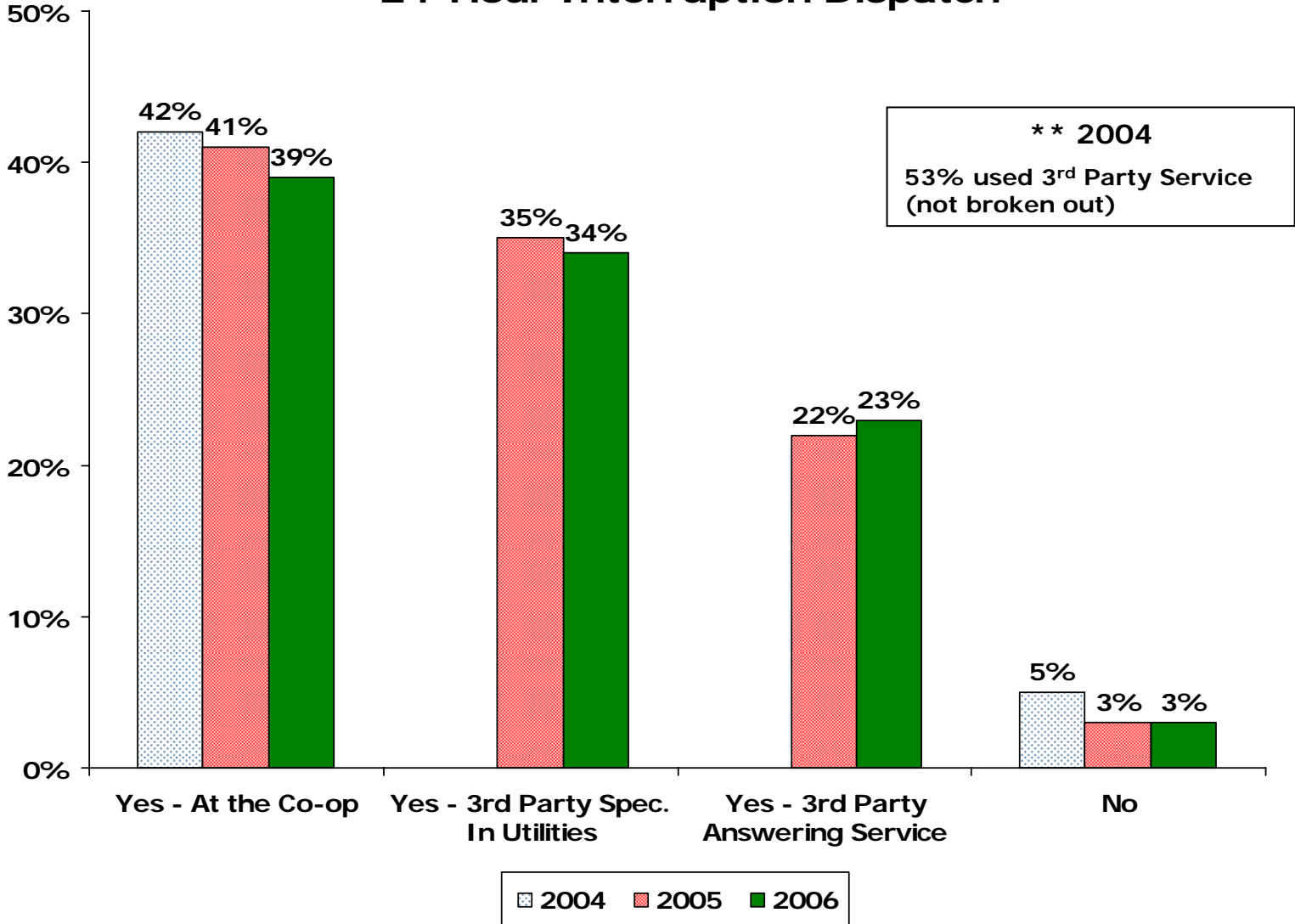
Cooperative Have a SCADA System



Cooperative Implemented An Automated Monitoring System Beyond Typical SCADA to Review Momentary/Sustained Interruptions

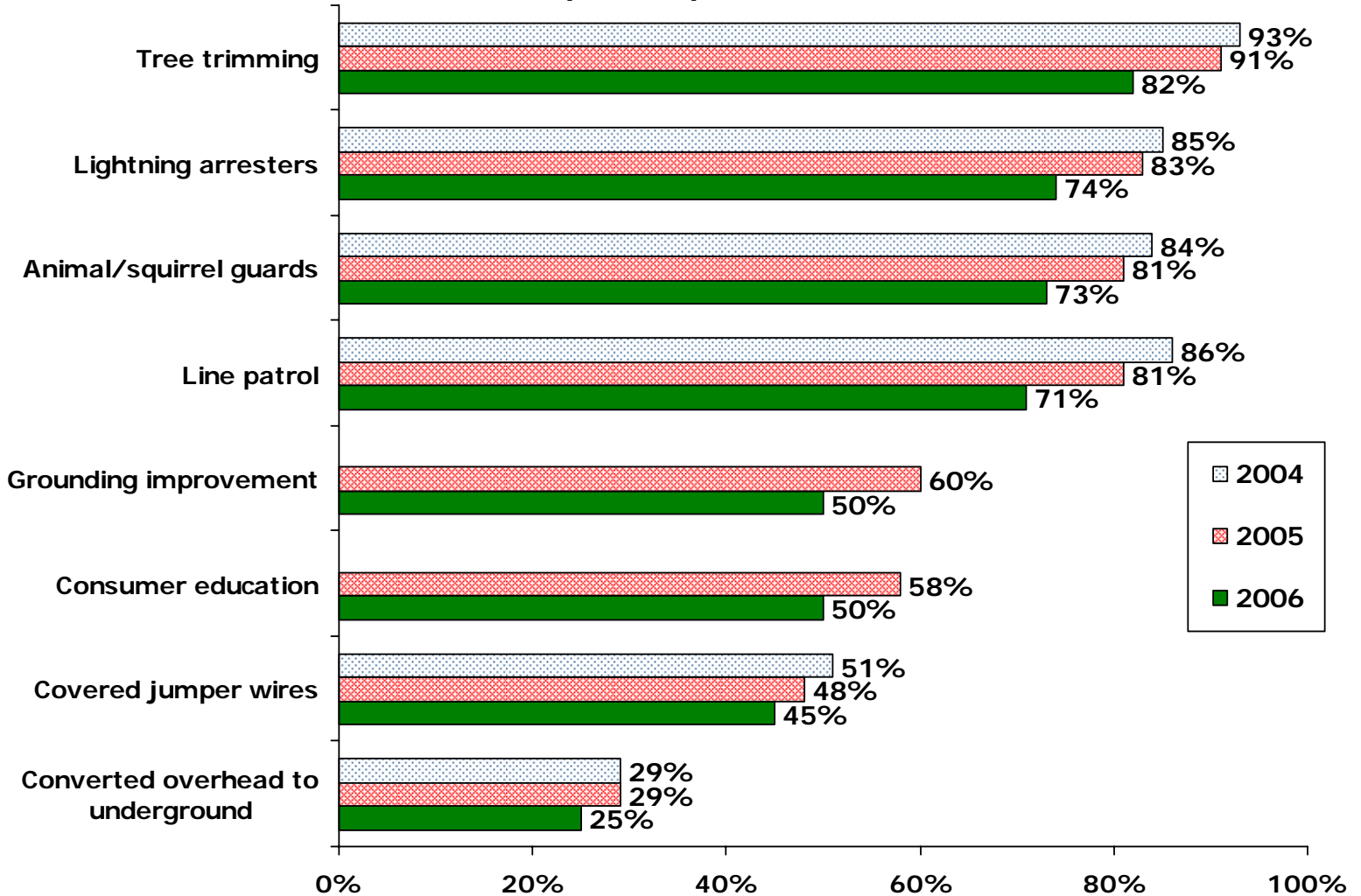


Cooperative Provides 24-Hour Interruption Dispatch

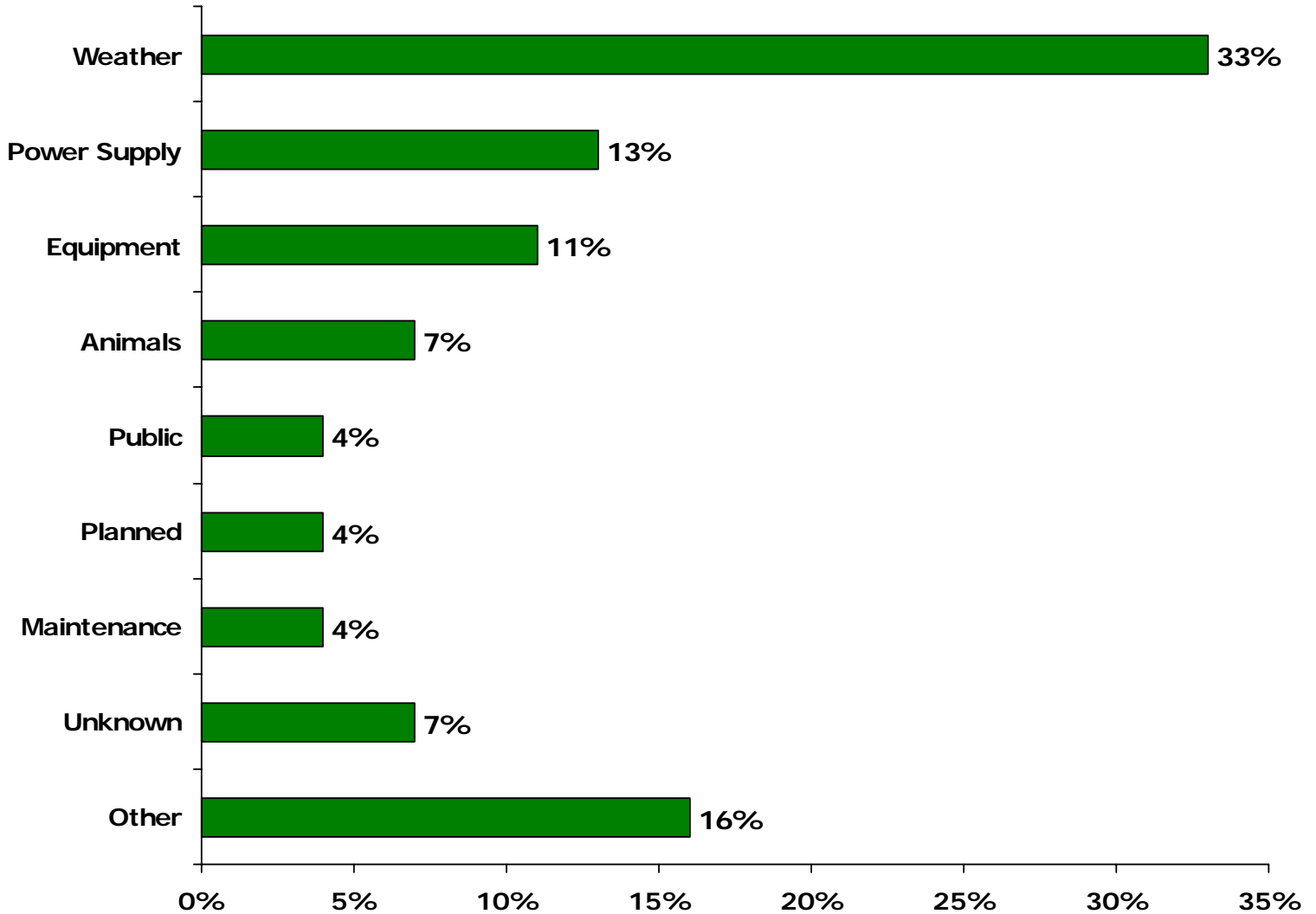


Prevention

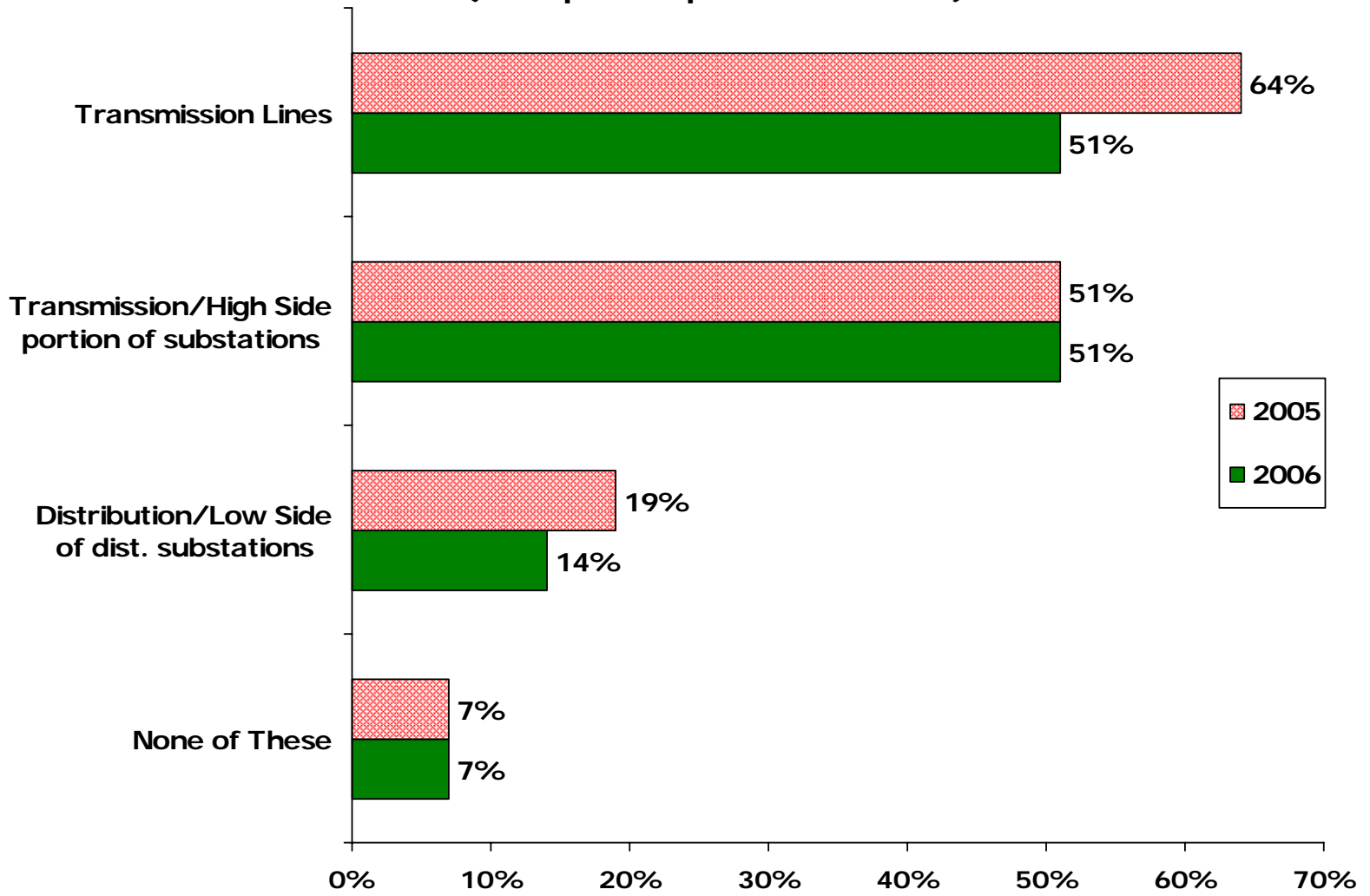
Interruption Prevention Plans Cooperative Has Implemented (Multiple Responses Possible)



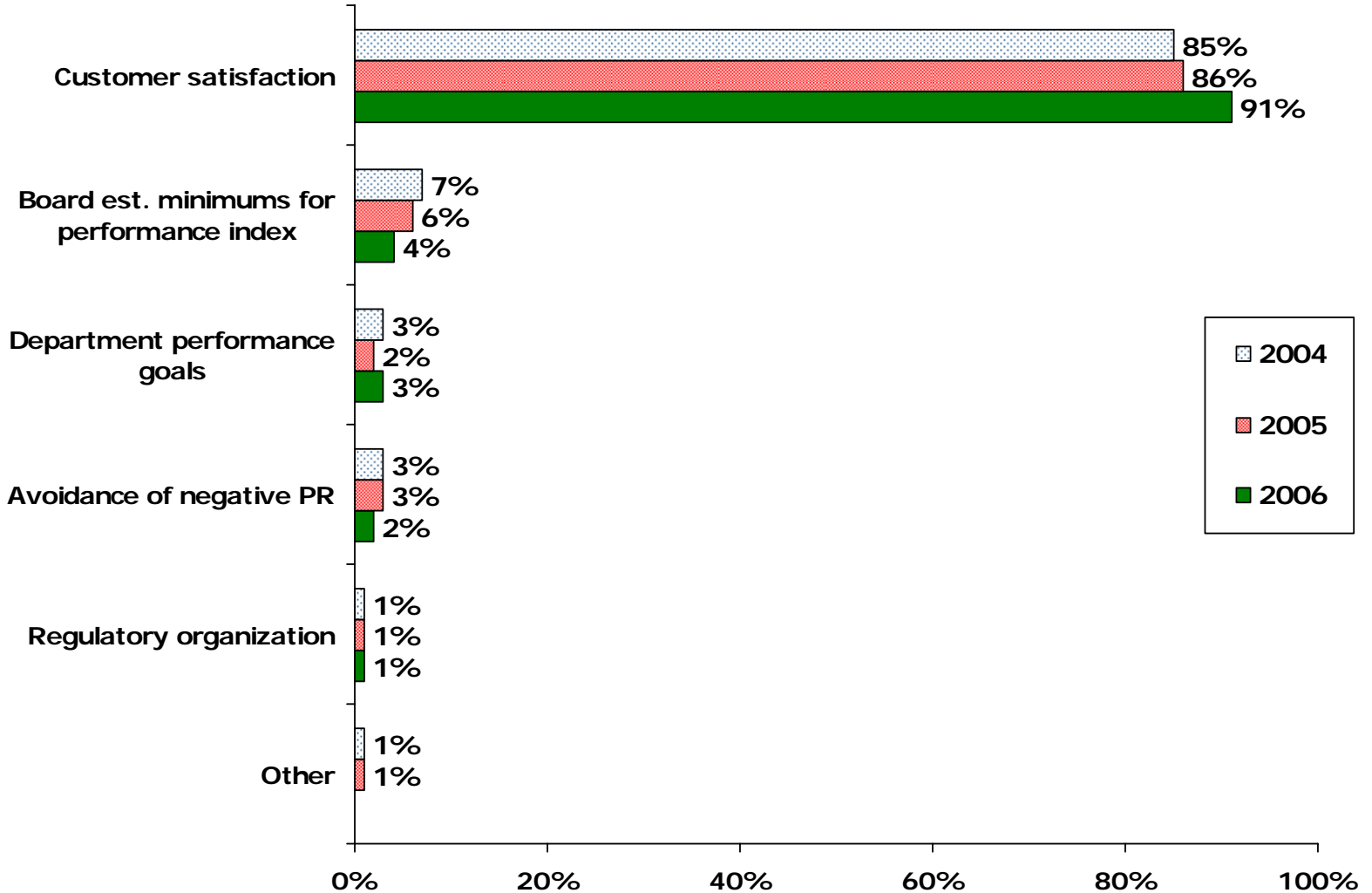
Causes of Interruptions (Average Percentage Reported)



What is Classified As A Power Supply Interruption For Majority of System (Multiple Responses Possible)

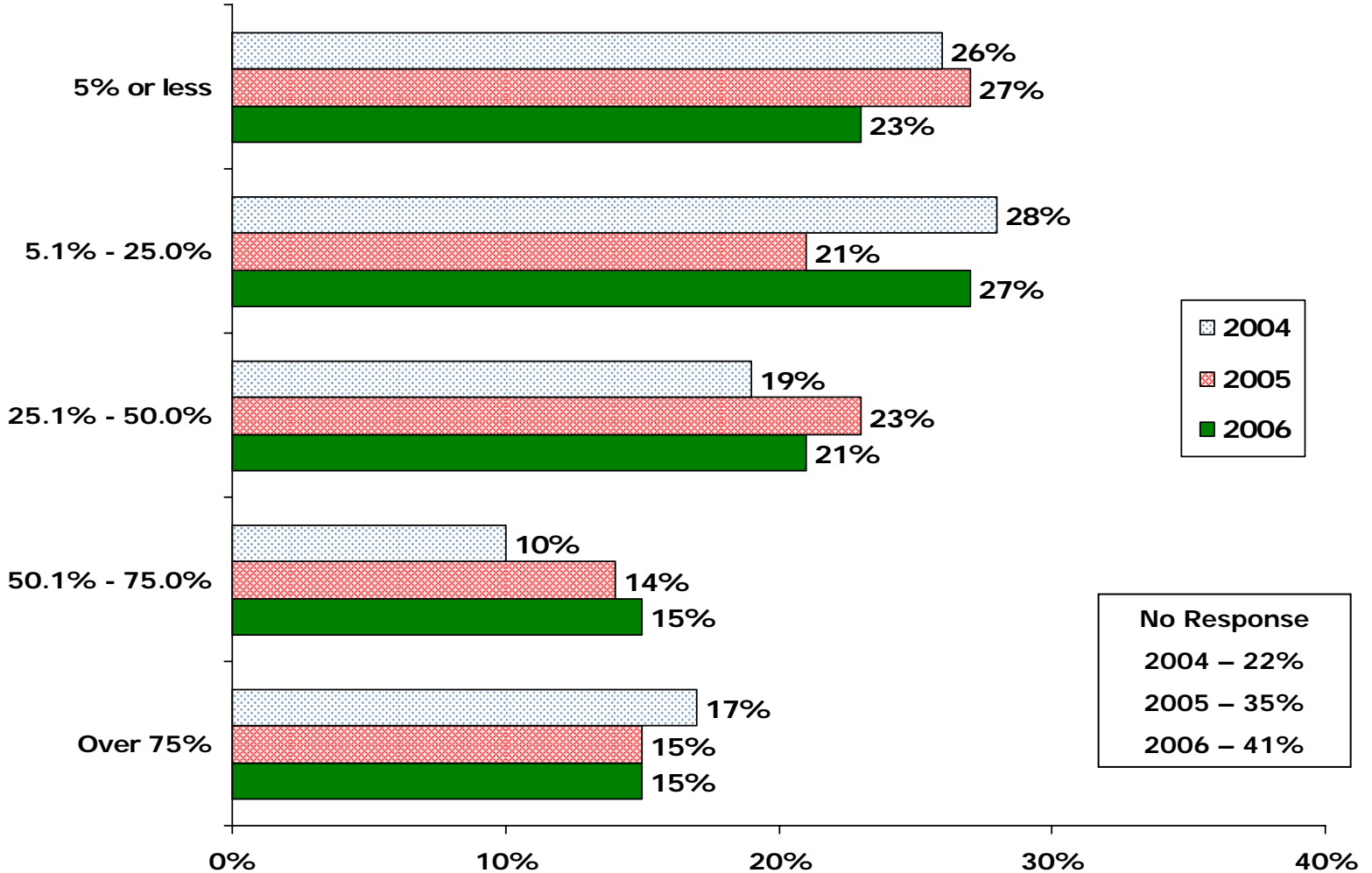


Co-op's Primary Motivation for Improving Its Reliability System



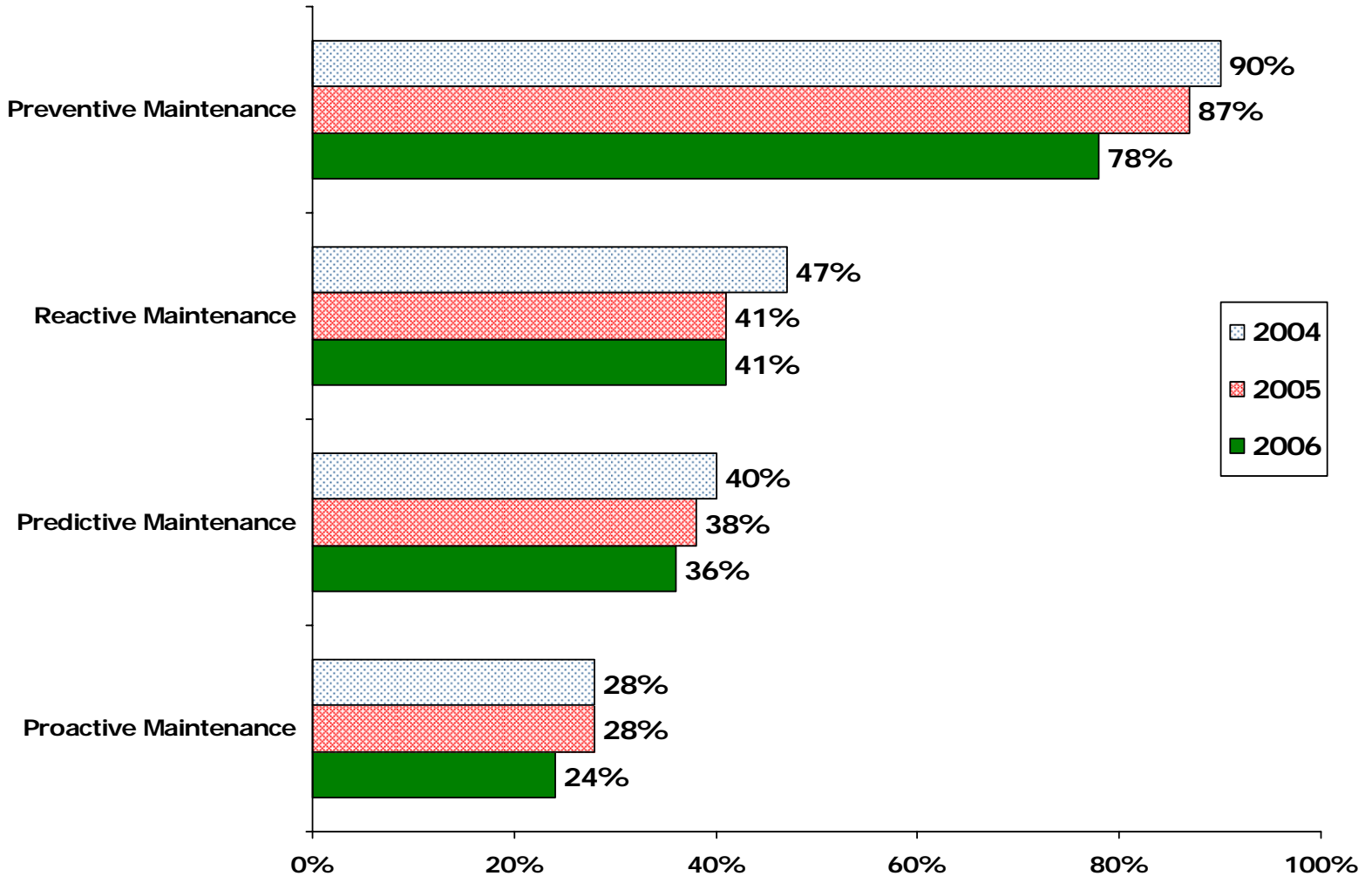
Percentage of Annual Budget for Interruption Prevention For Tree Trimming

Means: 2004 = 32.6% 2005 = 35.9% 2006 = 36.1%



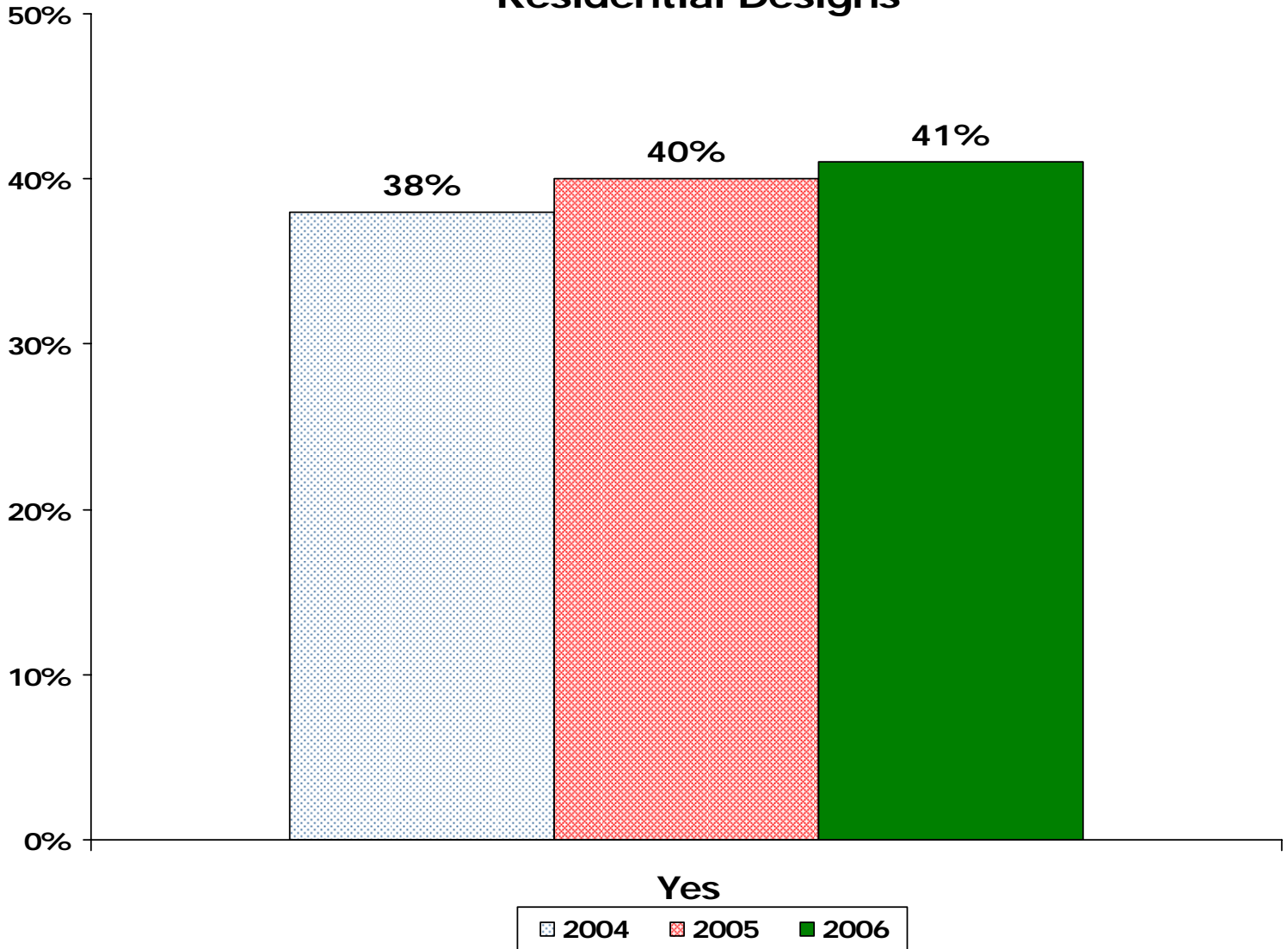
Percentages graphed are based on those responding.

Type(s) of Maintenance Program Cooperative Applies To Its System (Multiple Responses Possible)

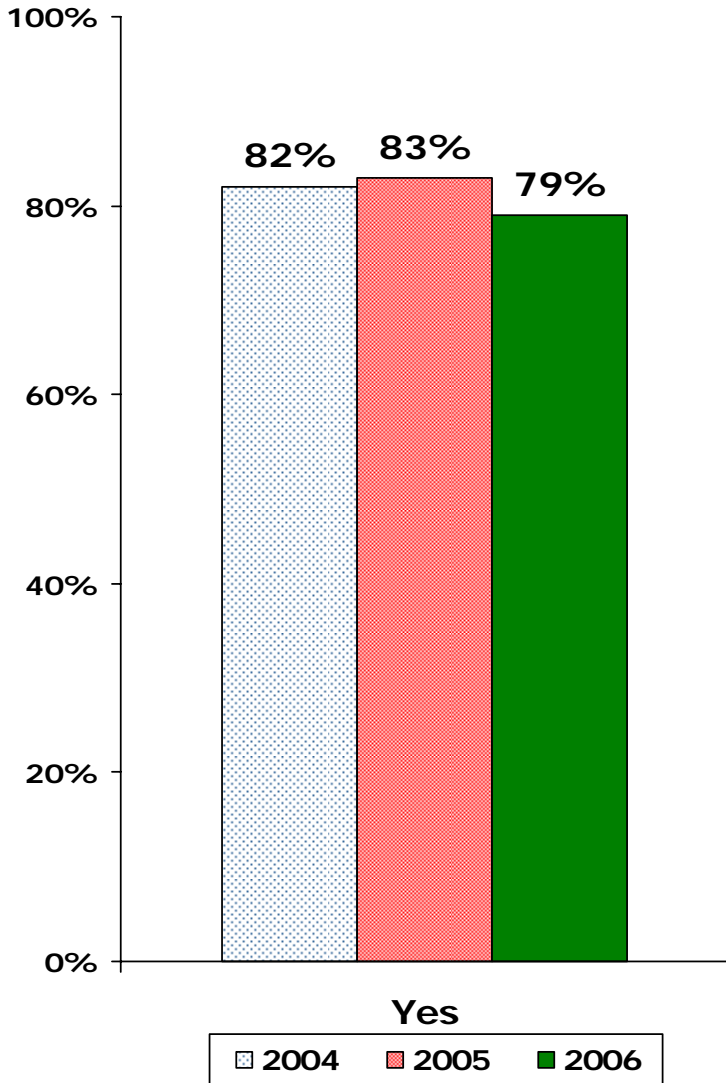


System Operation

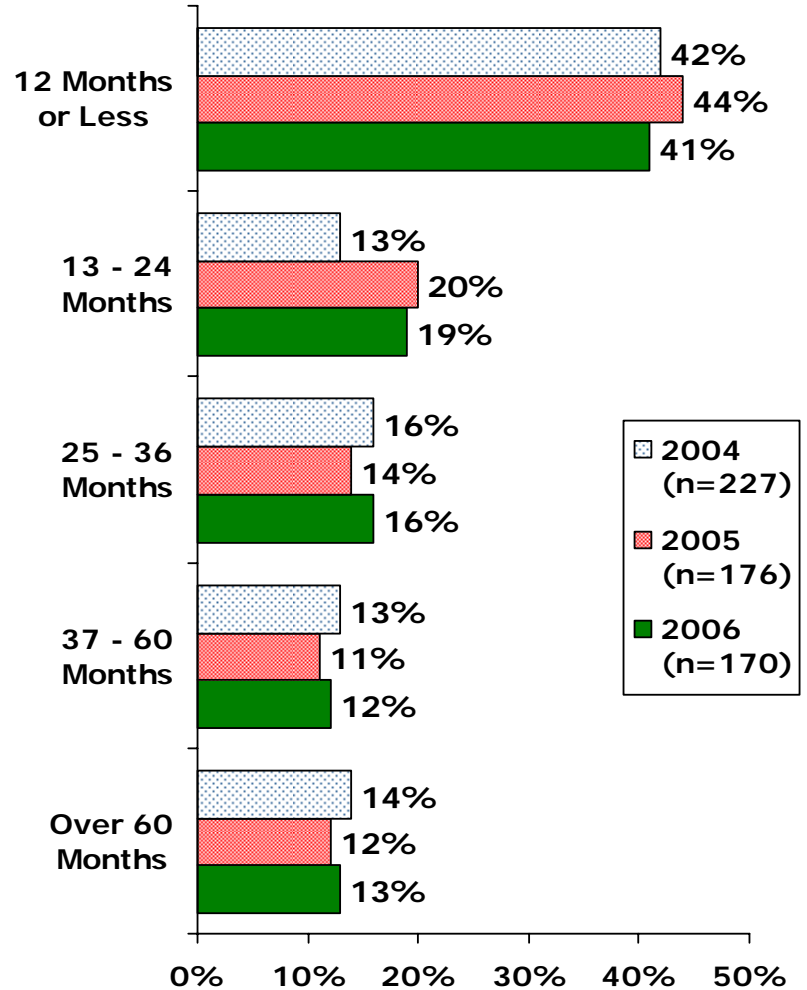
Cooperative Utilizes Flicker Standards for Residential Designs



Have Regular Visual Inspection Plan for System

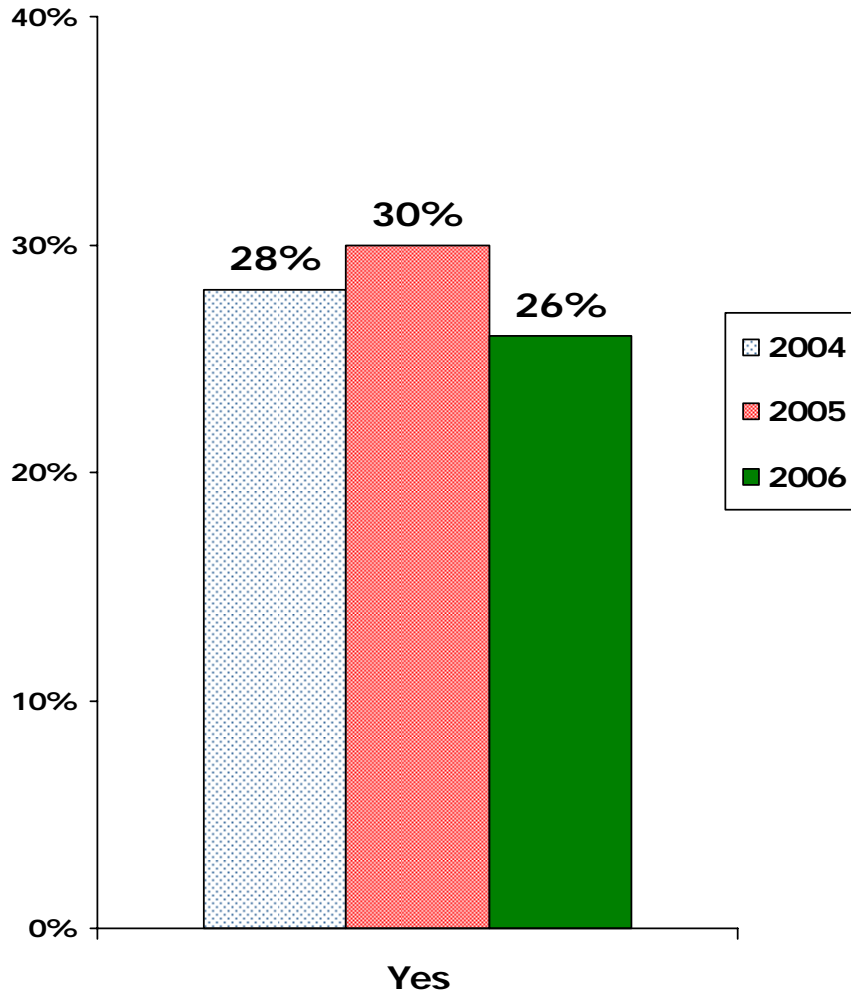


IF YES: Over What Period of Time?

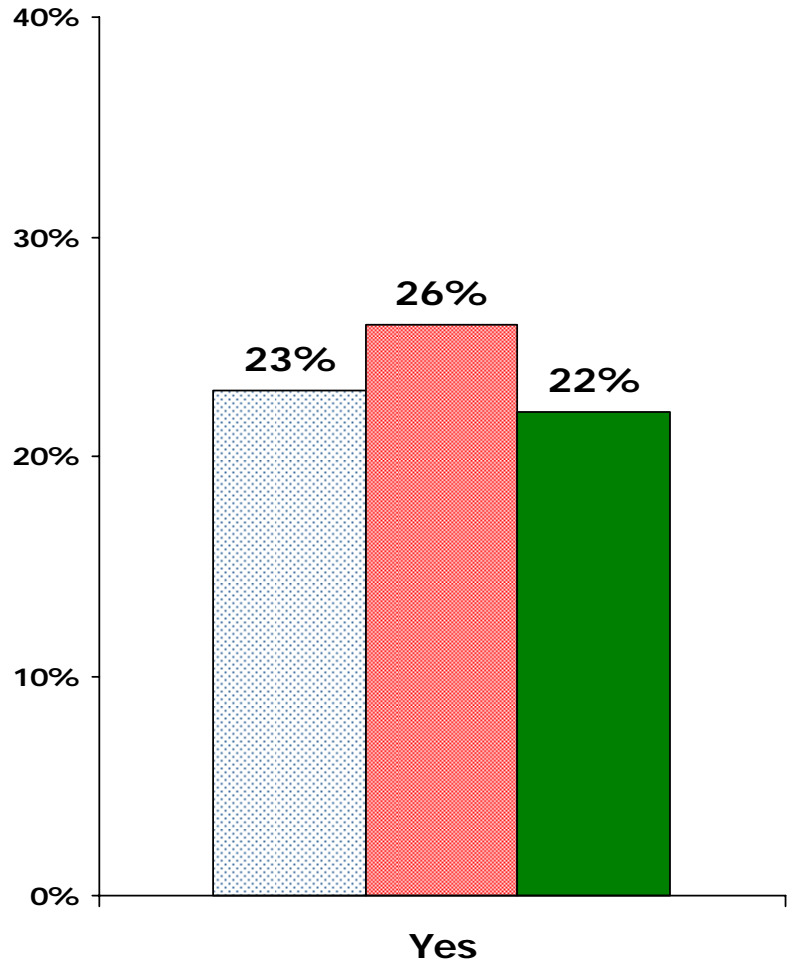


Sample Profile

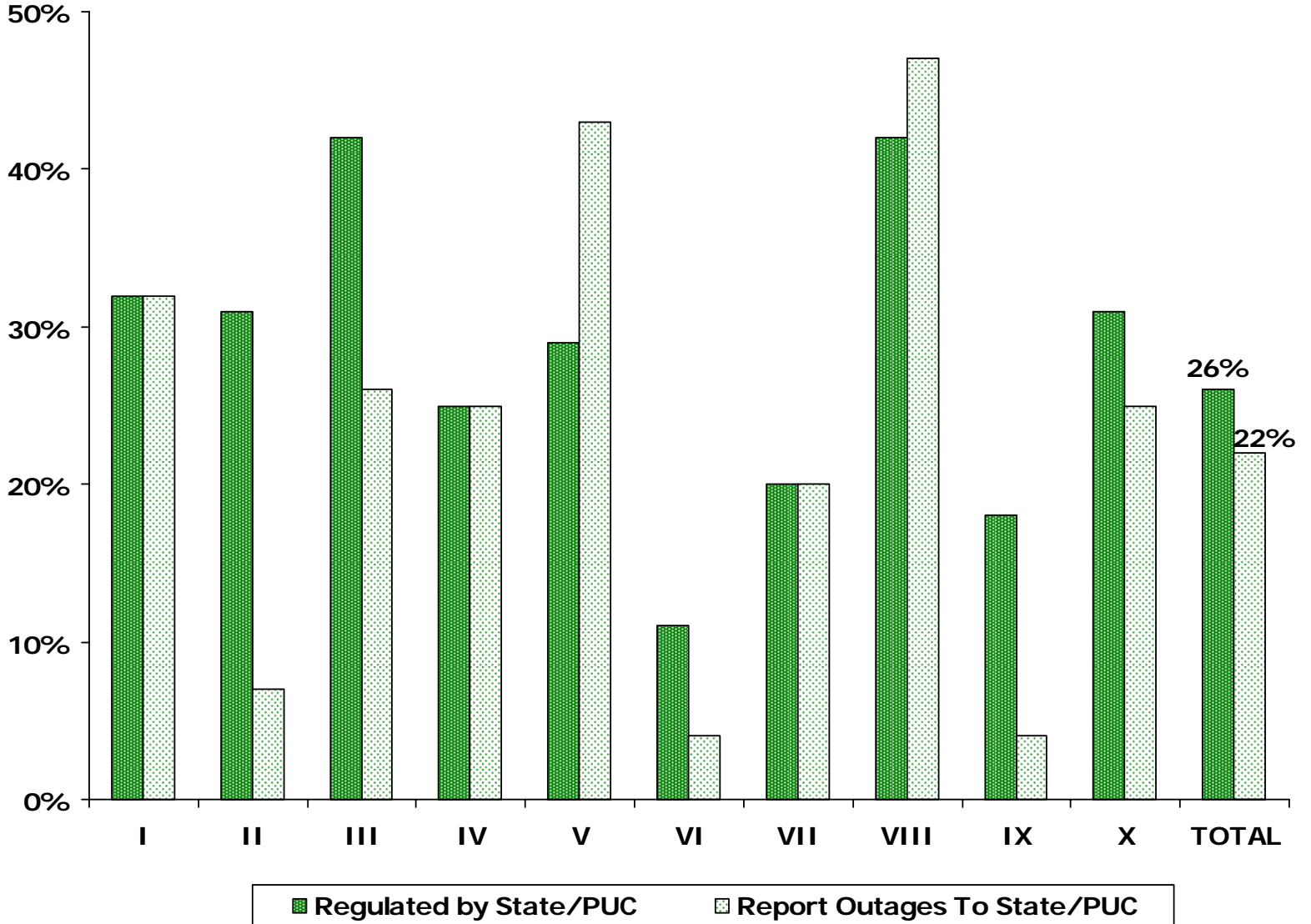
**Subject to Regulation by
State/Public Service Commission**



**Report Power Outages to
State/Public Service Commission**

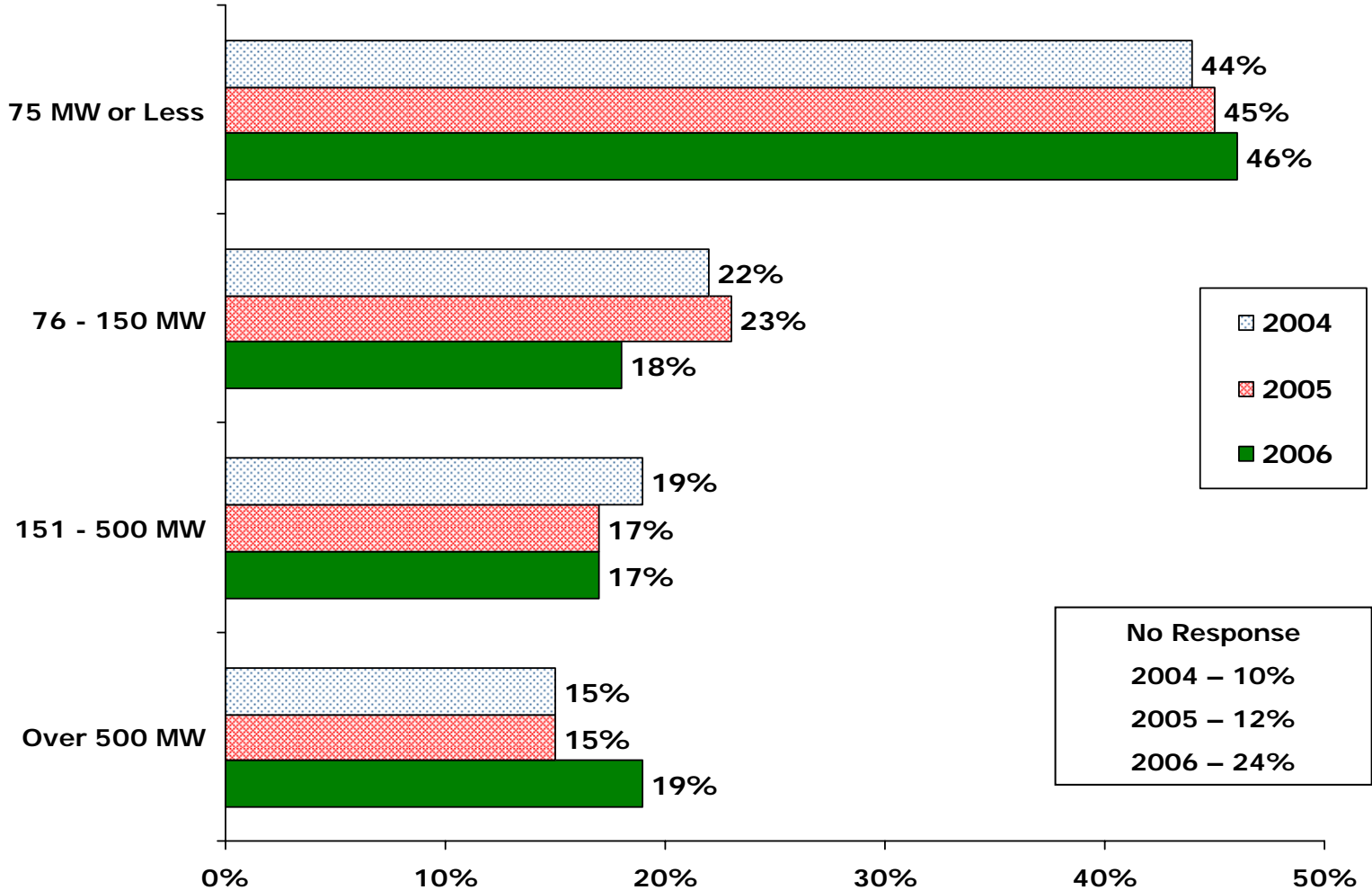


Co-op Subject To Regulation by State/PUC



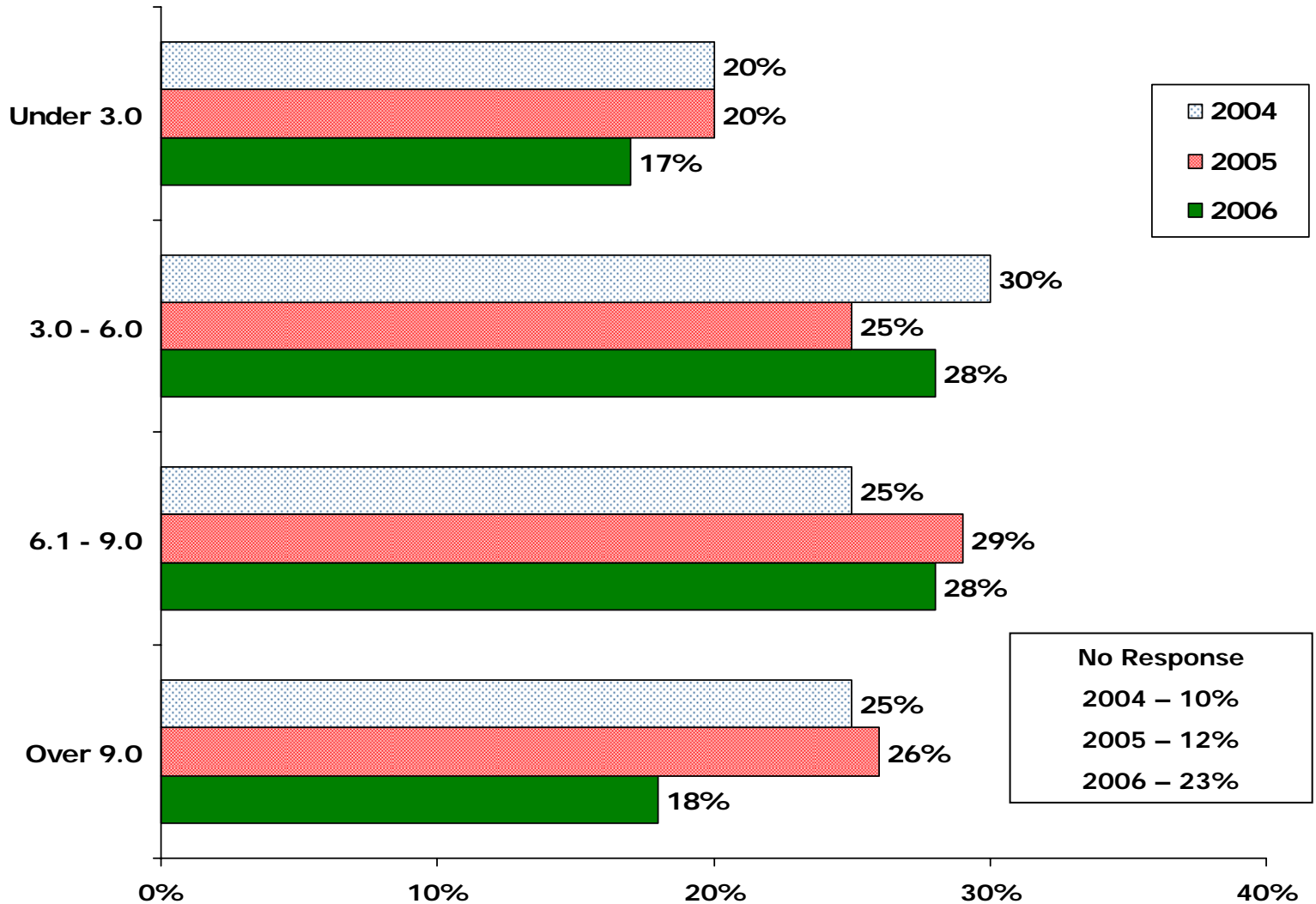
Cooperative Coincident Peak Load

Mean: 2004=15,176 MW 2005=13,225 MW 2006=17,653 MW



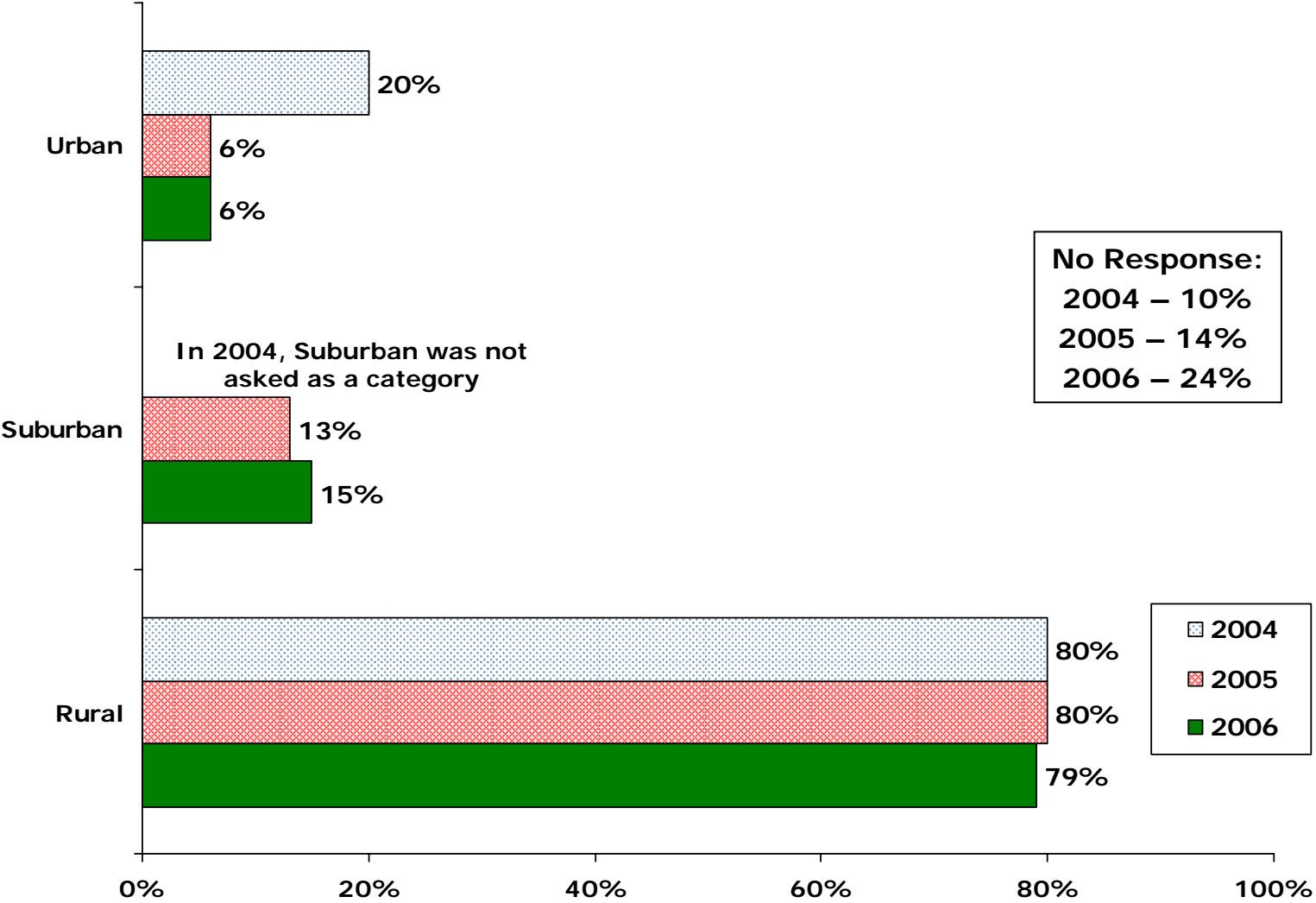
Percentages graphed are based on those responding.

Number of Customers Per Mile of Distribution Line



Percentages graphed are based on those responding.

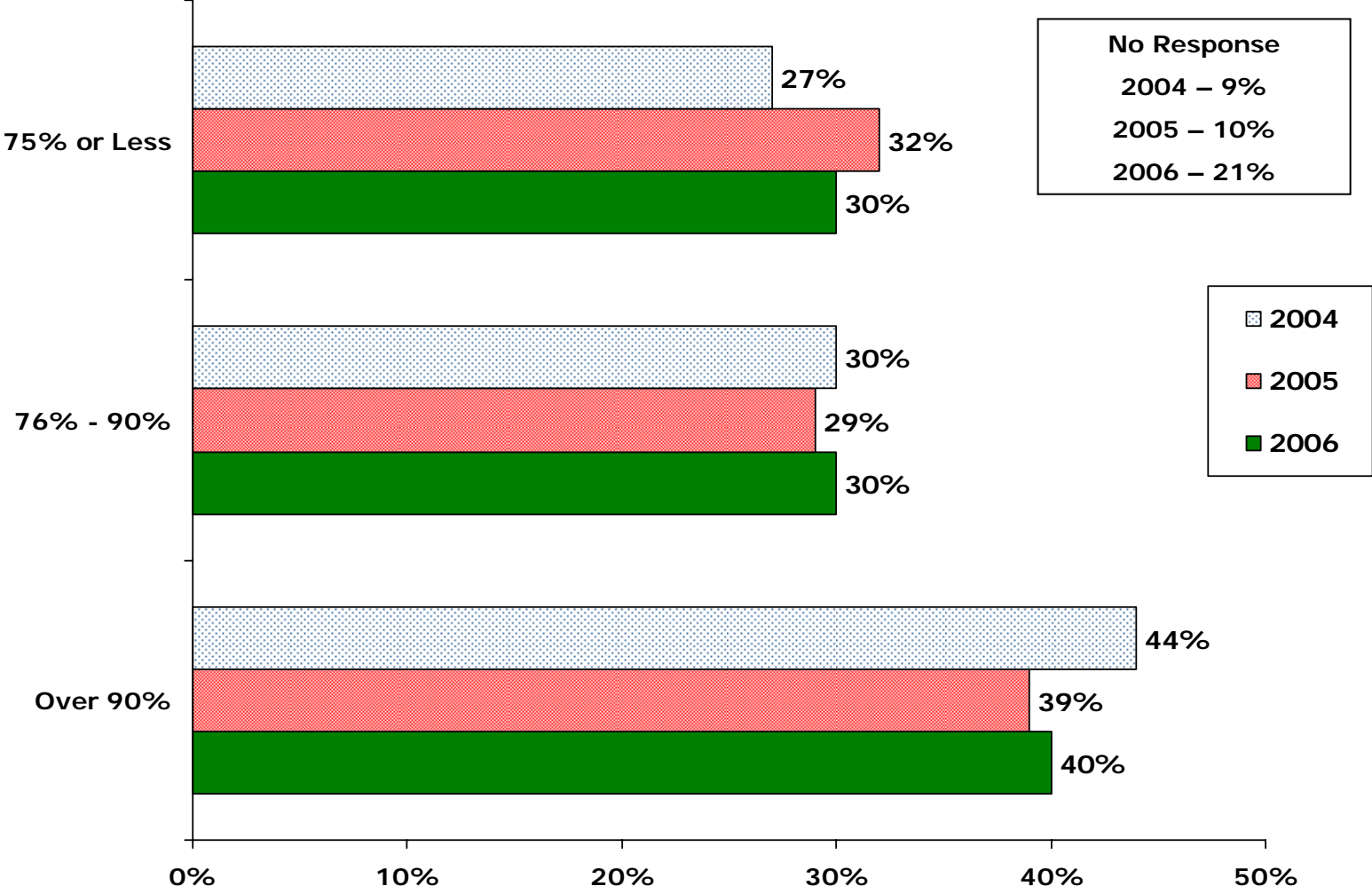
Load Breakout



Percentages graphed are based on those responding.

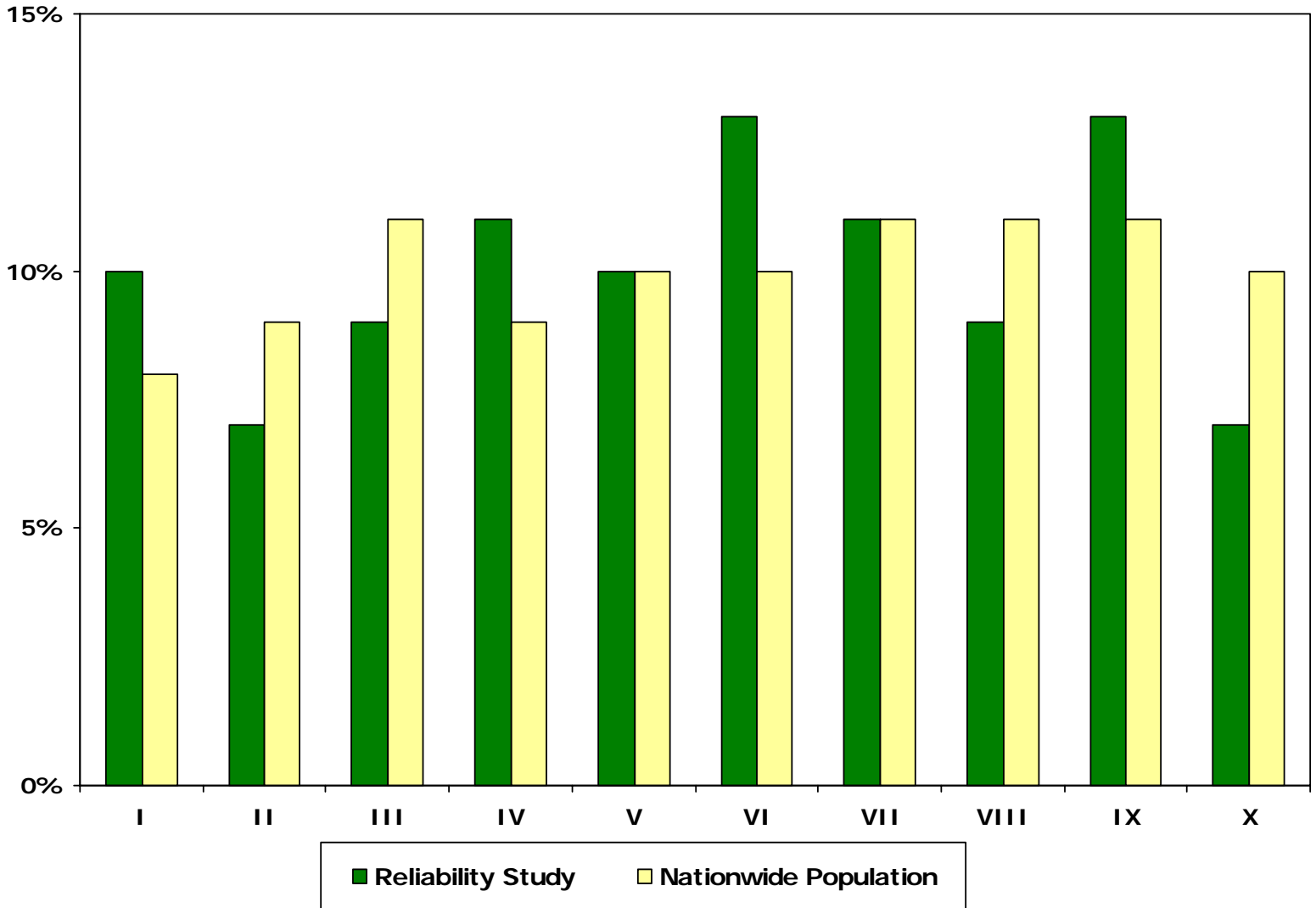
Percentage of Line that Is Overhead

Means: 2004 - 83% 2005 - 81% 2006 - 82%



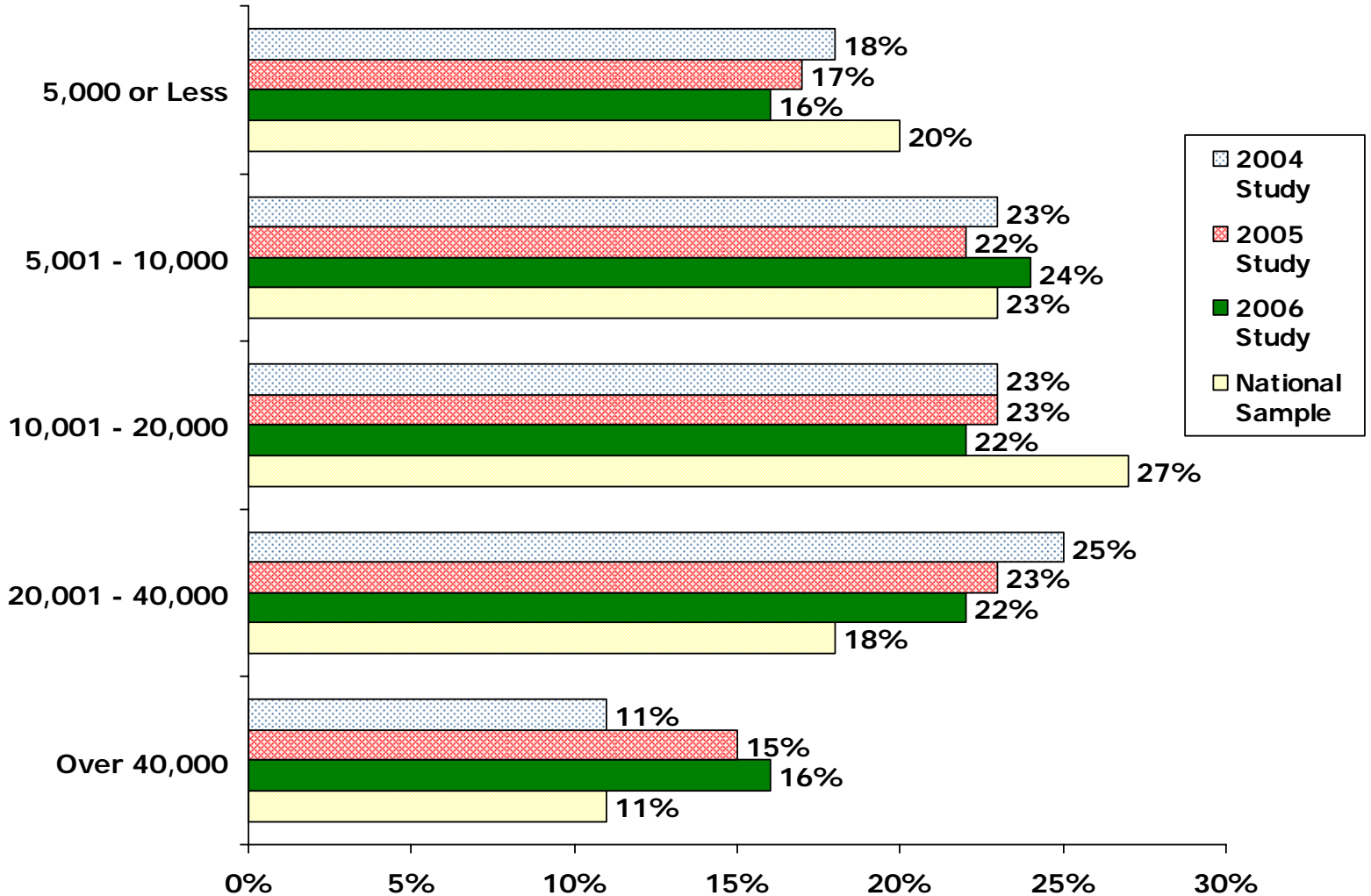
Percentages graphed are based on those responding.

Survey Respondent Composition as Compared To National NRECA Region Breakout



Survey Respondent Composition as Compared To National NRECA Breakout

-- Number of Consumers Served --



Survey Respondent Composition as Compared To National NRECA Breakout -- Three Year Growth Rate --

