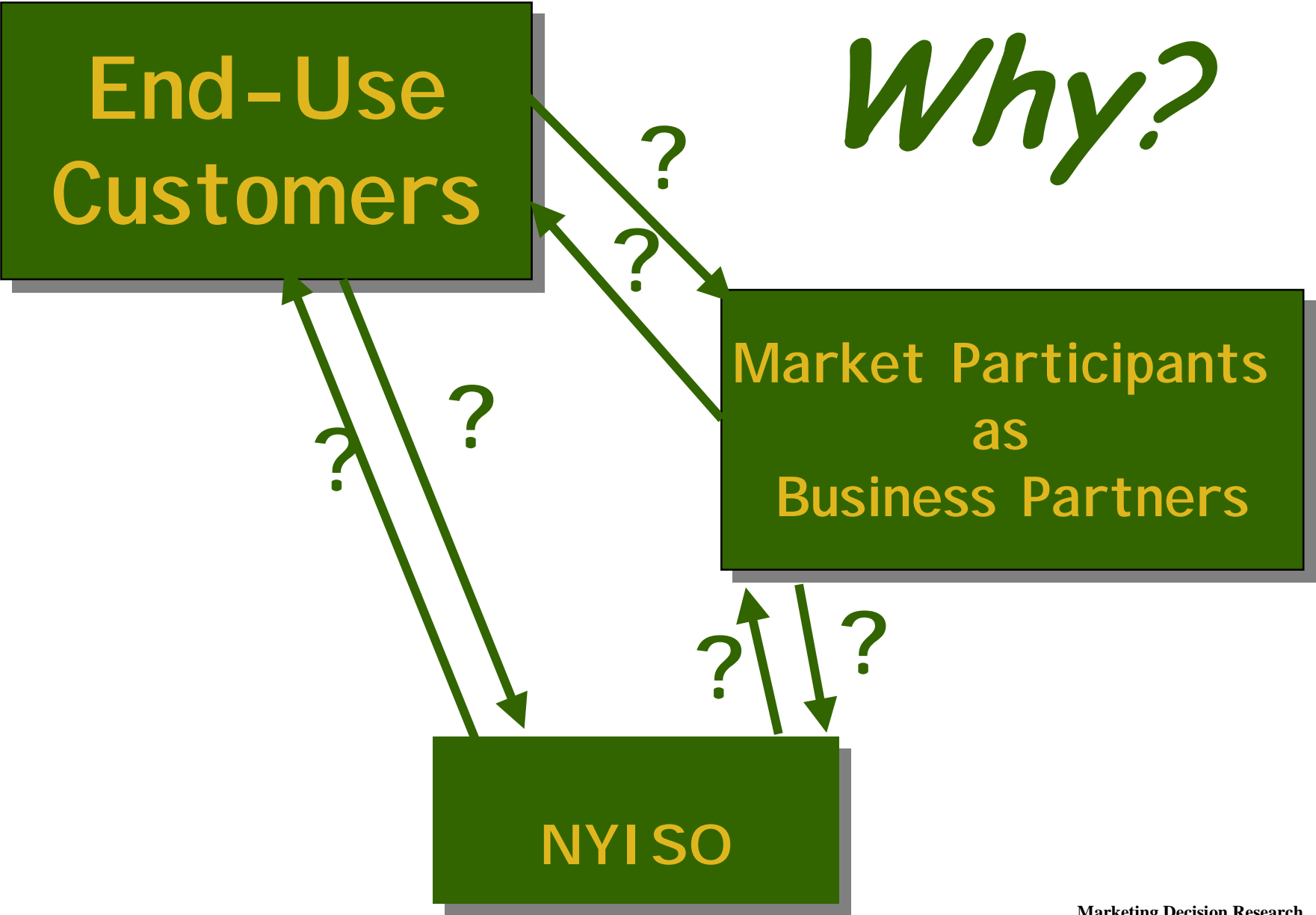


***Market Assessment:
END-USE CUSTOMER PREFERENCES
FOR PRICE RESPONSIVE LOAD
MANAGEMENT PRODUCTS***

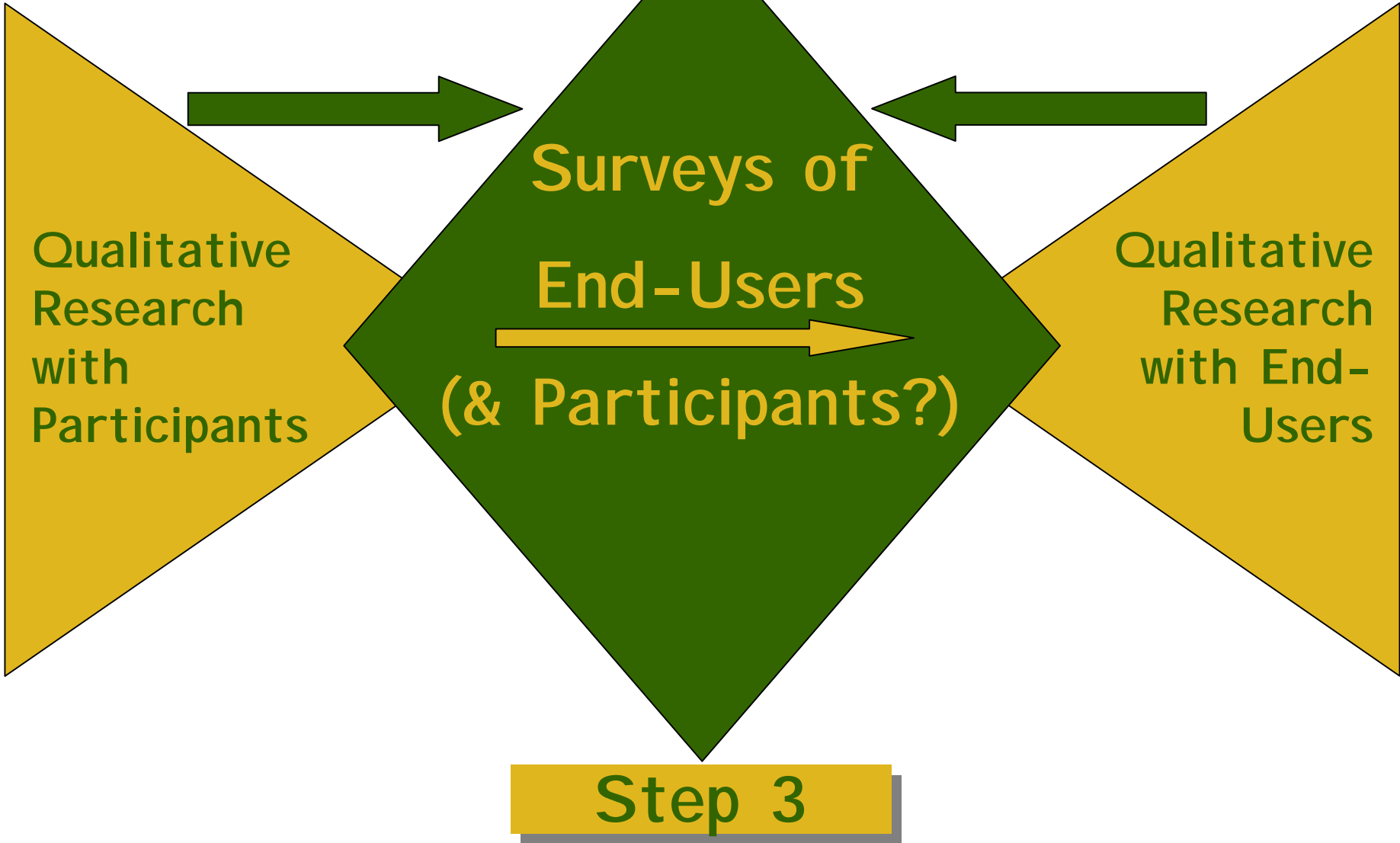
Ken Deal

Multiple-Party Exchange Transactions



Step 1

Step 2



Step 1:

- Perspectives/ Preferences of Market Participants?

Step 2:

- Perspectives/ Preferences of End-Use Customers?

Step 2 Purpose: Focus Groups with End-Use Customers

- Determine how Emergency and Economic Programs can be designed and introduced most effectively
- Understand customers' likelihood of subscribing.

Research Questions

Awareness/
Knowledge

PoP or
Option/Penalty

Strike points
(\$/kW; \$/kWh)

Notice time

Exposure

Frequency

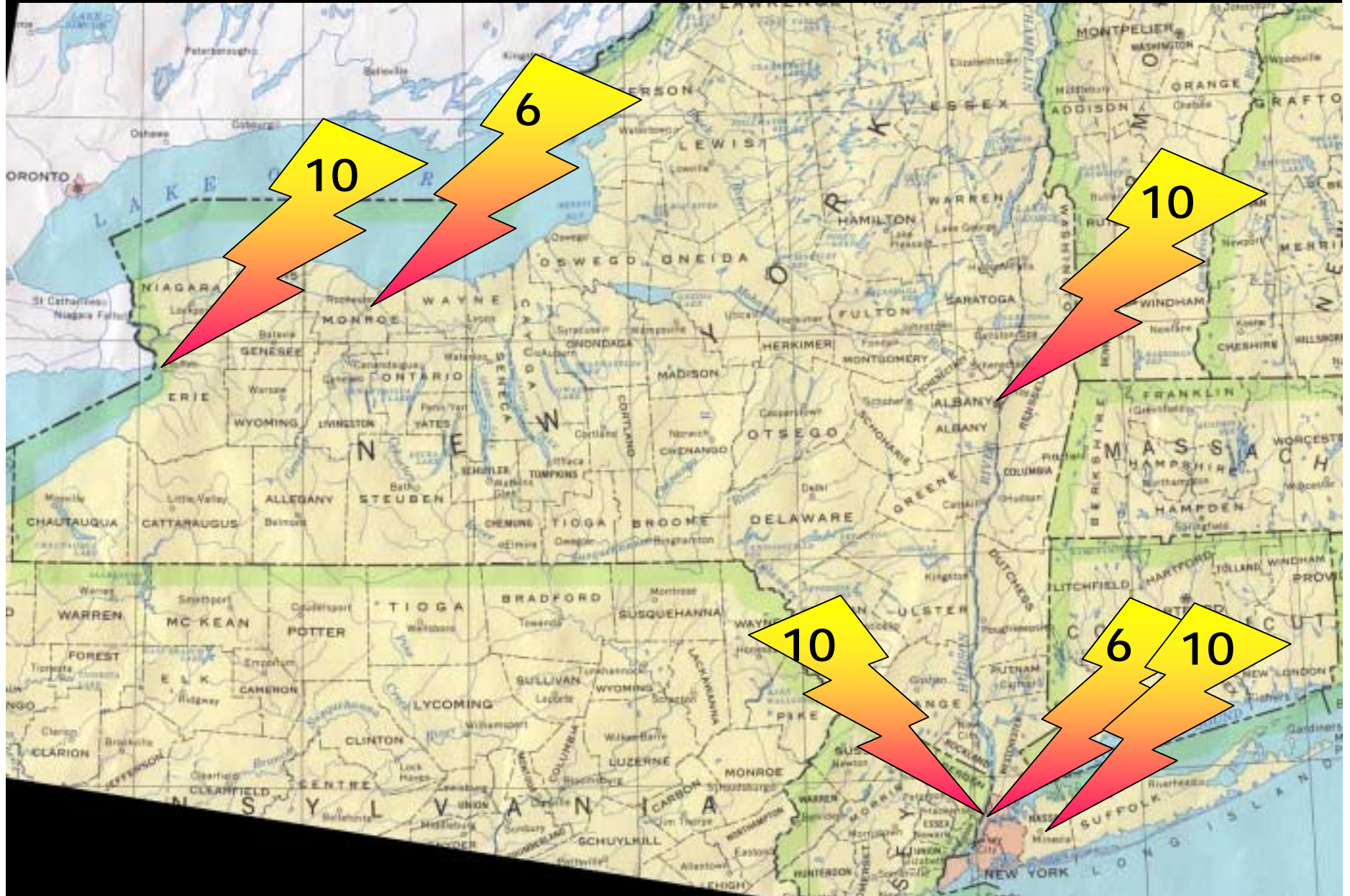
Duration

Curtailment
Pledge

Metering +



6 Groups; 52 Customers; Nov 28th Noon to Nov 30 6PM



Step 2: Focus Groups with End-Use Customers

Methodology

- 6 Focus Groups #
 - NYC 1: Med C&I , Nov 28 noon 6
 - Long Island: Small comm, Nov 28 7pm 10
 - NYC 2: Lge C&I , Nov 29 noon 10
 - Albany: Med C&I , Nov 29 6pm 10
 - Rochester: Lge C&I , Nov 30 noon 6
 - Buffalo: Lge C&I , Nov 30, 6pm 10

These are the Preferences and
Prejudices of *Your* Customers

Broad Cross Section of Customers

- Health care: several
- Financial, banks, traders: several
- Municipal, state, federal: several
- Steel processing: several
- Manufacturing: several
- Developers, property managers
- Small retail, services: variety
- Small commercial, industrial: variety

Key Finding MP Groups: Base Requirements



Existing Programs

**NYS
Emergency
Solution**

**True Economic
Demand-Side PRL
Programs for All
Customer Classes**

Program A

- Pay on Performance Rate
 - \$0.50 per kiloWatt hour for all curtailment during a 'called' event.
- Penalty
 - none

Program B

- Option Payment
 - \$10 per kiloWatt per month
- Non-compliance Penalty
 - \$0.75 per kWh

Base Program

Period: May - Aug

Notice: One Hour

Exposure: All Days → 24 hours each day

Maximum Duration: 10 hours each event

Event Frequency: Maximum 1 per day
: Maximum 7 per week

Exposure Total: 18 events over 4 months
: 140 hours over 4 months

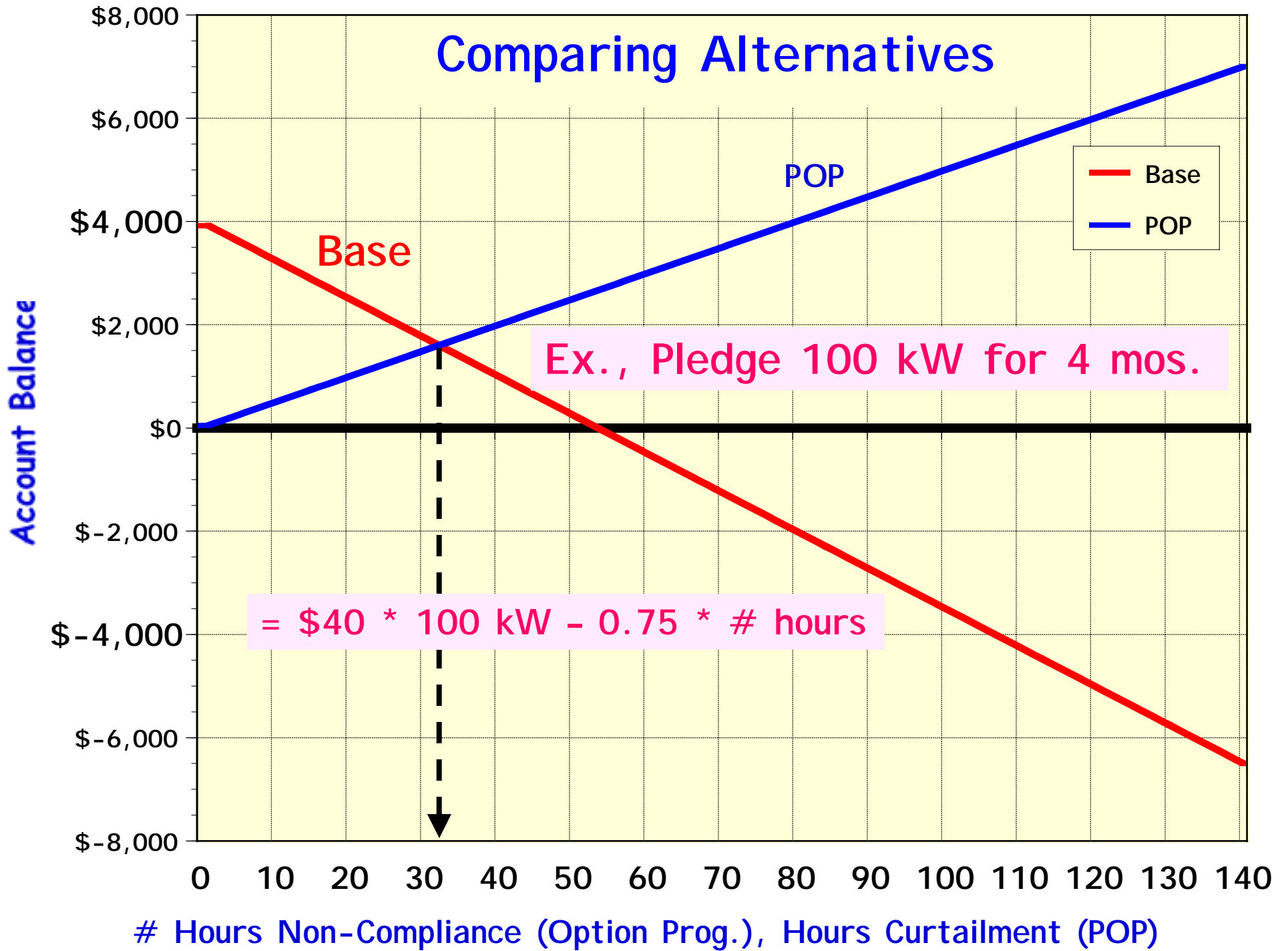
Program A

POP Rate:
\$0.50/kWh

Program B

Option Payment: \$40/kW
Noncompliance Rate:
\$0.75/kWh

Comparing Alternatives



Case 1

Period: May - Aug

Notice: One Hour

Exposure: **Weekdays** → **8 a.m. to 8 p.m.**

Maximum Duration: **8** hours each event

Event Frequency: Maximum 1 per day

: Maximum **5** per week

Exposure Total: **16** events over 4 months

: **100** hours over 4 months

Program A

POP Rate:
\$0.50/kWh

Program B

Option Payment: \$36/kW
Noncompliance Rate: \$0.75/kWh

Case 2

Period: May - Aug

Notice: One Hour

Exposure: Weekdays

→ Noon to 7:00 p.m.

Maximum Duration: 5 hours each event

Event Frequency: Maximum 1 per day

: Maximum 4 per week

Exposure Total: 12 events over 4 months

: 50 hours over 4 months

Program A

POP Rate:
\$0.50/kWh

Program B

Option Payment: \$24/kW
Noncompliance Rate: \$0.75/kWh

Case 3

Period: May - Aug

Notice: 4 hours

Exposure: Weekdays



Noon to 7:00 p.m.

Maximum Duration: 5 hours each event

Event Frequency: Maximum 1 per day

: Maximum 4 per week

Exposure Total: 12 events over 4 months

: 50 hours over 4 months

Program A

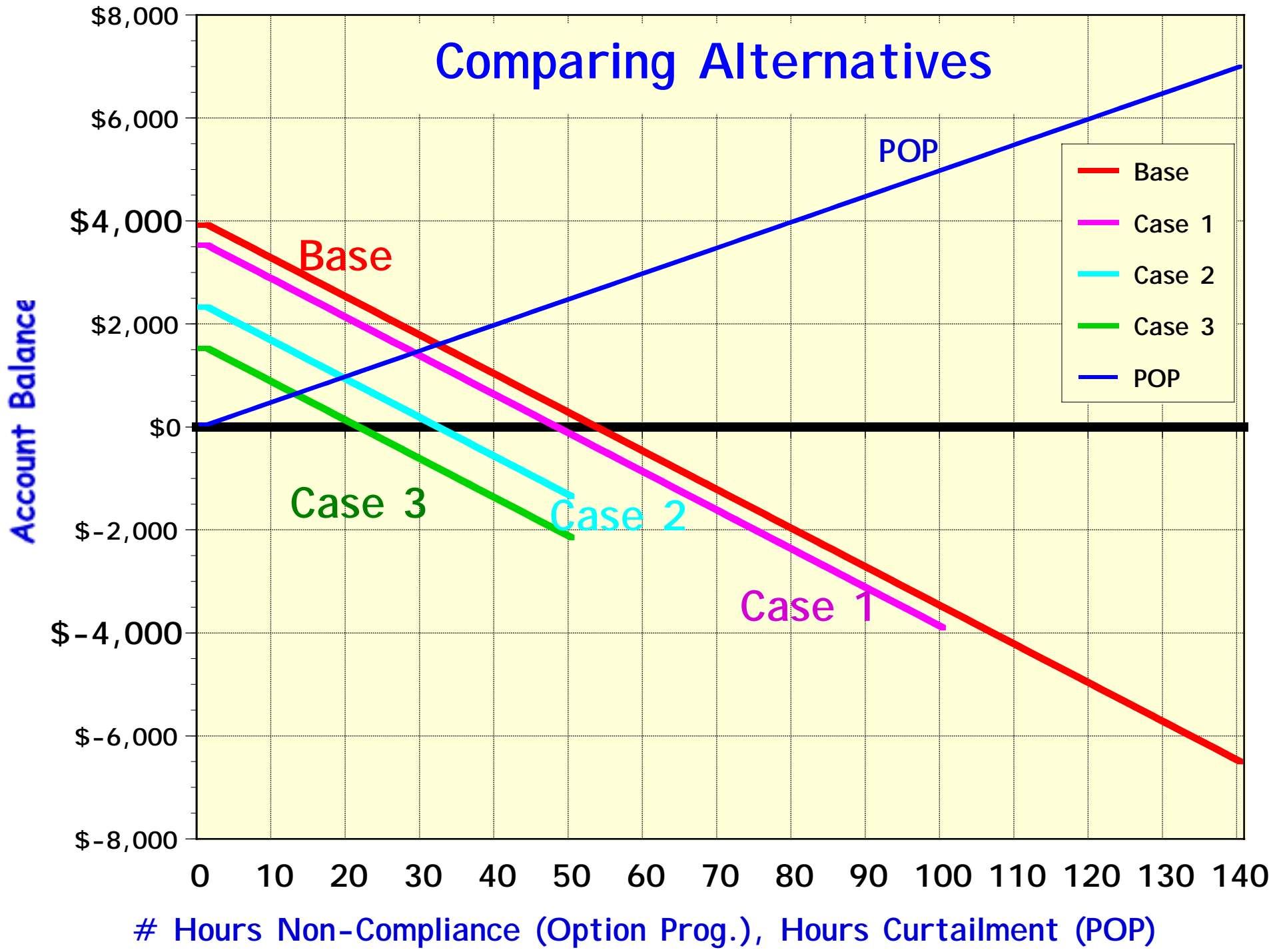
POP Rate:
\$0.50/kWh

Program B


Option Payment: \$16/kW

Noncompliance Rate: \$0.75/kWh

Comparing Alternatives



	Base	Case 1	Case 2	Case 3
Period:	May - Aug			
Notice:	1 hr	1 hr	1 hr	4 hrs
Window:	All days/wk	weekdays		
Expo/day:	24 hrs/day	8am - 8pm	noon - 7pm	noon - 7pm
Max Hrs/Ev:	10 hrs/event	8 hrs	5 hrs	5 hrs
Event Freq.:	1 event/day			
Max/week:	7 per week	5	4	4
Total/term:	18 events	16	12	12
Hours/term:	140 hours	100 hrs	50 hrs	50 hrs

Program A				
Option:	\$40/kW	\$36/kW	\$24/kW	\$16/kW
Penalty:	\$0.75/kWh			

POP Program B: \$0.50/kWh

Key Findings

Preliminary Feedback

What's a Focus Group?

1. Qualitative Research, NOT Quantitative!
2. Get in-depth consideration and comments.
3. The "group effect".
4. Best use –
 - Help to understand customers at a base level.
 - Prepare for a survey
5. Treat numbers cautiously, NOT a Survey.

Cleanest Example Overall

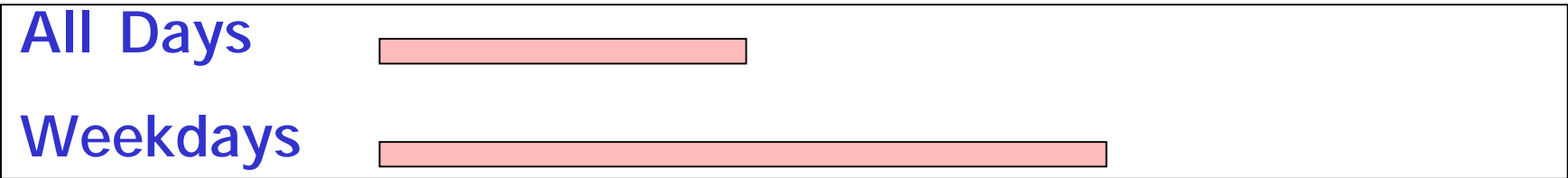
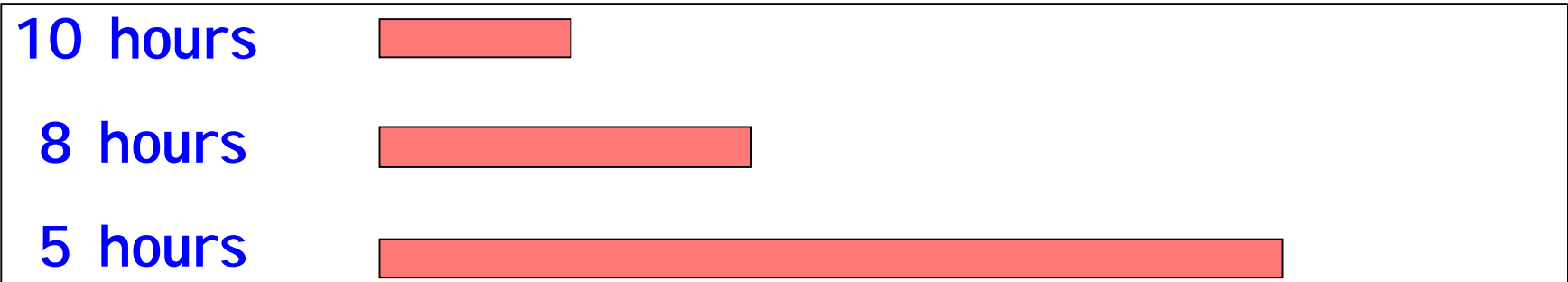
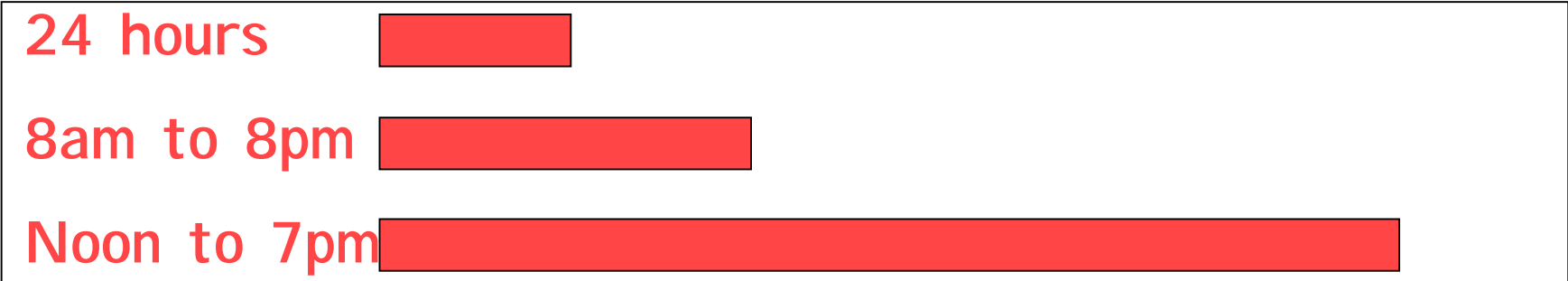
1. Golf Club - financial manager
2. Peak set by recharging of golf carts
3. Unplug 25 carts to comply.
4. Choice:
 - Option/Penalty Program
 - Base Case

Event Notice: #1 Key Attribute

1. Created the greatest shift.
2. Many prefer a 4 hour notice, some can easily react to 1 hour notice, several suggested a 2 or 3 hour notice.
3. Less notice time requires higher rewards.

NOTE: THESE GRAPHS ARE REPRESENTATIONS OF QUALITATIVE RESEARCH. THEY ARE NOT BASED ON SURVEY INFORMATION.

Overall Relative Preferences



Exposure Window: #2 Key Attribute

1. Noon to 7pm was most popular.
2. 8am to 8pm second most popular.
3. 24 hrs/day was difficult or impossible for many ... felt to be 'incorrect' since emergencies rarely occur from 8pm to noon and on weekends.
4. Exposure time should be kept within normal working shifts.

Max Event Duration

1. Split reaction
2. Running too long on 'emergency' DG might cause breakdowns and failed compliance under Option/Penalty.
3. Not running long enough does not allow POP subscribers to make enough money to overcome startup hassle.

Exposure Frequency

1. Reducing from 5 to 4 ... very popular
2. 2 per week would help swing many

Program A

- Pay on Performance Rate
 - \$0.50 per kiloWatt hour for all curtailment during a 'called' event.
- Penalty
 - none

Program B

- Option Payment
 - \$10 per kiloWatt per month
- Non-compliance Penalty
 - \$0.75 per kWh

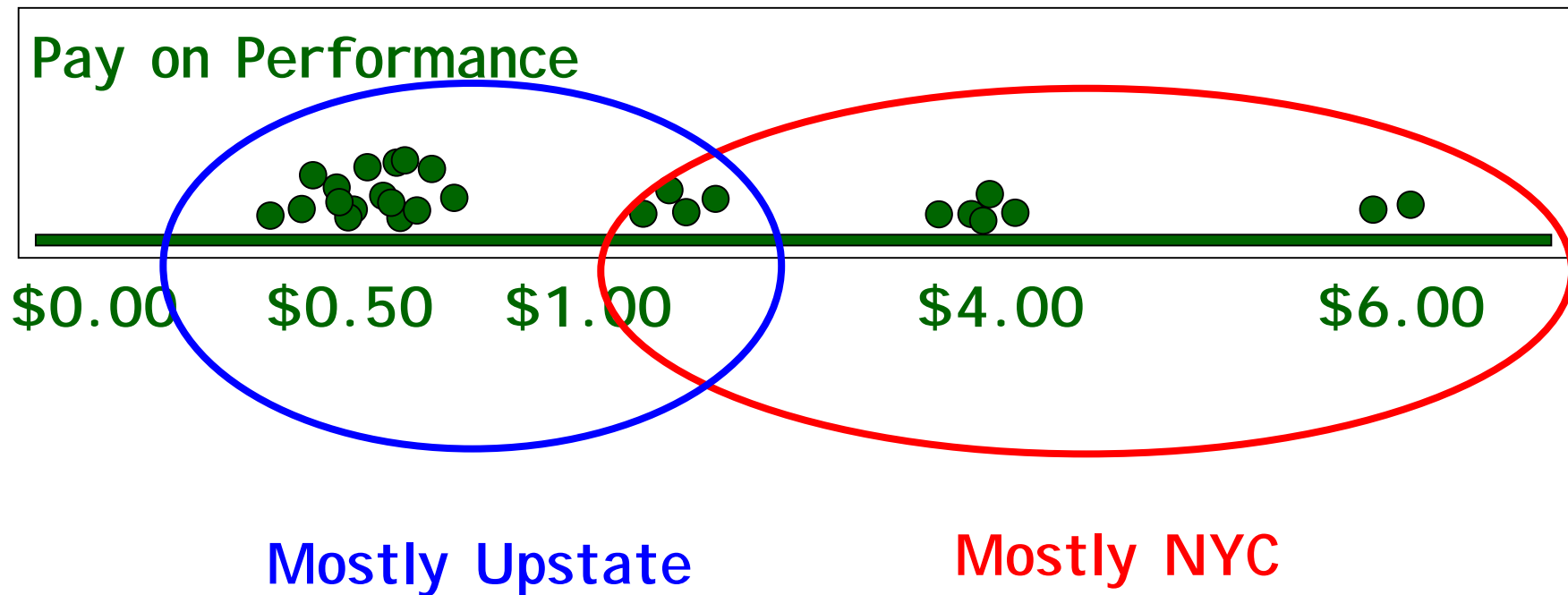
Program Preferences: POP vs Option/Penalty

1. At first sight the POP was preferred over the Option/Penalty program by most.
2. While most continued to prefer POP, around $\frac{1}{4}$ to $\frac{1}{3}$ would subscribe to the Option/Penalty program, if the reward/penalty prices are appealing.

POP Requirements

1. Outside of NYC & L.I., the \$.50/kWh was acceptable to several.
2. NYC: at least \$1.50 to \$2.00
 - Several said that \$4 was their minimum.
 - Some as high as \$5 to \$6.
 - Some want 40% - 50% of the action.

Preferences: Pay on Performance



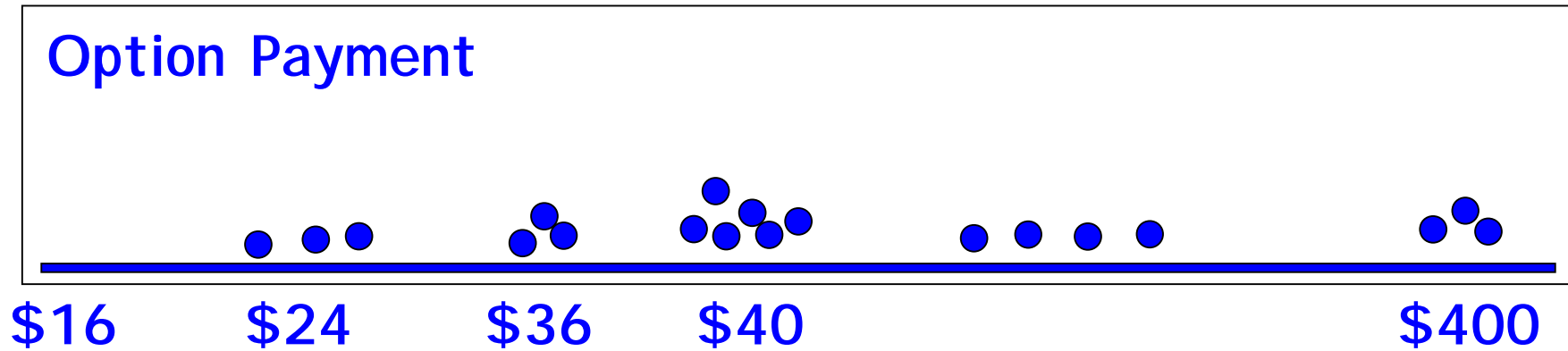
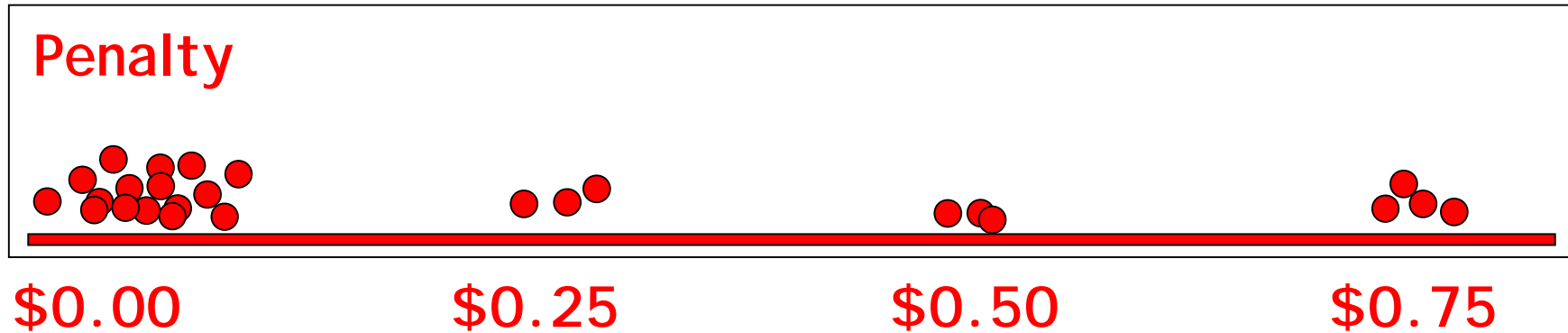
Option/Penalty Requirements

1. Definitely second to POP.
2. Penalty held substantial risk for many
3. Allowing one 'free' noncompliance event greatly cushions the penalty ... will allow some to accept lower option payment.
4. Penalty should decline when Option decreases.
5. Penalty is absolutely unacceptable to most public sector customers.

Option/Penalty Requirements

1. Options of \$40/kW/period, \$36, \$24 could be acceptable to many.
2. \$16/kW/period was just too small.
3. NYC: \$100 to \$500 for some.
4. Many recognized the logic of the penalty with the option, but their emotions worked against the penalty.
5. The Option with no Penalty was wanted by several.

Preferences: Option/Penalty Program B



Net Effect of ...

1. POP rate:

- Desire to run longer during each event
- Put more DG on line
- Perhaps less actual compliance

2. Option Payment:

- Up-front financing of DG
- Ensure DG is maintained to perform
- Want shorter infrequently called events

3. Penalty:

- Shy away from program to avoid risk
- Ensure DG is working to avoid risk

Key Findings

1. Large NYC customers more demanding than other areas of NYS
2. Very small commercial customers are most hesitant
3. Sectoral differences require different solutions
4. At the right price, nearly everyone responds.
5. While Pay on Performance is desired initially by many, the Option/Penalty program can work with some, depending on the money.
6. While they understand the huge downside of not subscribing, the rewards must be commensurate with difficulties of complying and risks.

Key Findings

8. Metering is very important to knowledgeable customers.
9. Additional DG strongly related to Option Payment by some.
10. Day Ahead notification often preferred.
11. Financial support to add DG requested (NYSERDA).
12. Demand charges considered important by knowledgeable customers.

Key Findings - Awareness/Knowledge

1. Large C&I know what's happening in the market and understand their jobs.
2. NYISO plan compared to ConEd, NYPA and RG&E programs.
3. Small Comm need significant education and consultation to be able to participate.

Consultation and Education

1. It was especially important for small commercial customers to have someone consult with them to identify how they could curtail demand. Several felt that they could not think of participating unless this consultation took place first.

"But it's hard to give a number off the cuff"

"I don't know about the price, I would have to run some numbers because you get the aggravation factor and maybe you would have to, in my situation you would have to pay to automate some of the on/off's with the generator the end plant. Then I would have to look at extra wear and tear, I would have to look at the maximum run hours. Say I am exposed for 50 hours I would have to look at what it is going to cost me to generate with #2 diesel on my emergency generator. I would have to look at the delta in what I buy liquid nitrogen for versus what I manufacture it for."

Awareness/Knowledge

1. Most larger C&I participants understood what they had to do internally to comply or could determine the appropriate actions through discussions with their engineers.
2. Small Comm had a hard time reading their bills. They did not know how they could comply.

Getting a Fair Deal

1. Many larger customers understood that there was money to be made in trading electricity and they wanted a piece of the action.
2. 40% to 50% of any money made should go to the customers who curtail, reduce and shift, i.e., those who make it possible.

Concerns/Suspicious

"It's unclear here, whether it is economically driven or resource driven. Is this a real emergency and is this going to come up every time? This a political issue. I mean is there really this resource crisis, or are the resources available at a price." *A very large public sector customer in NYC.*

Concern: # of Players/Providers

“But what concerns me is, like here we are getting power from ConEd Solutions. And the next year maybe an ESCO would be giving us our power. Who is going to be giving us our rebate, the ESCOs or ConEdison?” Lge public

“I really don’t know because I have a series of what I would call inter-locking relationships that might prevent this. I have a relationship with NYPA, and if I really drop or turn on 20 megs in a building and taking it completely off line, they are going to hit me. So I don’t know and then I have the commodity suppliers are getting into business and there are some restrictions on what you can and what you can not do.” Lge comm

Desire for DG

1. Few have significant DG that can be used for other than emergency usage.
2. Real concerns over environmental impact & penalties for use.
3. Great interest in obtaining DG.
4. Looking to financial help to add DG (NYSERDA, +).

Desire for DG

**“Now we are looking at full generation, leaving
Niagara Mohawk altogether and going to full
time generation.” *manager of town
facilities***

Key Findings - Desire for DG

"We are even looking at crunching some numbers and talking to people in my facility saying I would like to get another generator. Not an emergency generator, but a generator to augment our demand. And if that could be funded somehow, through this program, or some other program I would be happy to include that to my total. As I was saying I would like to add another 500 kW on you are talking about a capacity of about 1 ½ megs. But that is my facility, and I have 23 other facilities in Manhattan which are really not on board with this because they are afraid of it."

Desire for DG

“I am looking for additional generating capacity. If someone can develop some reimbursement methodologies and payment methodologies so that I can put additional generating capacities on any of my sites, I would be happy to do so, and I would be happy to try to push those packages to the group [of not-for-profit organizations] I belong to.” Large health care

Practicalities: Time of Day

1. Keep it within a working shift. Staff might not be in to take a call or to act on it.
2. "One concern I would have from at least from a high reliability facility is if I'm going to have to make a switch I'd much rather do so before the business day starts, or before the stock exchange starts trading."

Practicalities: Free Event

1. “You know, if you can get the option payment above \$40 and if there were **one free noncompliance event**, we’d look at a **reasonable penalty.**” *From a manager at a very large financial, who had previously stated that \$500/kW would be necessary.*

Practicalities: Bail Out

1. Several requested a bail out provision in the Option/Penalty program where they could terminate after 1 month with a reduced Option balance. *NYC financial*

Programs Tailored to Segments

1. Public sector/ public transportation want to participate.
2. Difficult to understand how they can subscribe.

“Public Transportation can’t respond during the day very well. Especially during emergencies, it must maintain its service. Develop a program in which it can participate during off hours, say 8pm to 8am.”

Segment: Colleges

1. Colleges find participation difficulties due to large number of buildings, lack of central control and old equipment.

“It’s difficult for us because we’re central office to 19 colleges. I can’t really obligate the college in that fashion.” NYC

Preparation and Knowledge Build Prior to Subscribing

1. "I was going to say two to three months because I would actually bring in meters to shut down the whole place, and run generators just to see what the impact was. To see what the loads are. What I could handle. And then I would pick a program."

Metering, Verification and Settlement

1. Some found it very difficult to discuss these programs without having answers regarding this issue.
2. These issues were stated strongly near the beginning of every large C&I group.
3. Some felt that the provider will pay for the metering.
4. Others thought that some grants or financing programs will be needed.
5. Several almost felt overwhelmed by the perceived metering difficulties.

Concerns over Existing Contracts

1. Several participants were concerned that their existing contracts were so restrictive that they could not participate in these programs.
2. “Can we participate in any other programs if we’re already in a program with ConEd?”
3. Concerns were also voiced over actions that would change their load shape.

Concerns over Existing Contracts

- **“I think the ISO has to put pressure on the Utilities that are not allowing us to run our generators.**
- **“That is a big one.”**
- **“That is why we are looking at being independent. It is because we can now not put generators on. NIMO doesn’t allow us to add any generators. ”**

Lead Time

1. For many, a lead time of 2 to 3 months for contract negotiation, consideration and decision is adequate.
2. Some needed 4 to 6 month, while others felt that 1 month was fine.

Protocol & Lead Time

“Without purchasing equipment, I probably would need two months to go through the numbers with the utility, and with my site management, and think about putting an internal process in place so that when that call does come, and some secretary gets it and says “What do I do with it?”, she has been trained, and we as a group internally will know how to respond.”

Concerns/Suspicious

"What is embedded in my gut, is that, if we sign up for this, it's my belief that what we saw last year was really avoiding the grenade, because the temperature was warm. I am convinced you guys are going to call a lot. So the certainty to me is that you are really going to call me whether it is 12 events, 16 or 18 events. In my heart of hearts I really believe that is going to occur. So I perceive the risk of signing up for any of these things really, really high." *A very lge comm customer in NYC.*

Concerns/Suspicious

“Well what is going to happen when they get enough generation up in 5 years from now? We spend a lot of money for generation and we do all this other stuff, now we are going to get dumped in 5 years. That would be another question I would have for them.” *Town operations manager.*

Sensitive to environmental concerns

"I'll give you a perfect example, not that is particularly relates to my buildings but I know of many buildings. And anybody who has a generator, you can look across the street. I don't see any right now, but some are located in the basement, it comes up, pops out, others have a low roof, whatever way it's run, depends on the type of generators you have especially if it's lightly loaded. When it starts, you get a big puff of smoke, smoke is coming out. I know of buildings where the neighbors across the street called. And they call and they come out, you end up getting a fine." *Very large financial services*

Other Concerns

“Transportation charges are going crazy, they can’t even figure them out right now. NIMO is in trouble with that because they don’t know what it is costing them or how they are going to edge their profit back into it, plus they have lost a supply.”



Next Step?

Discrete Choice Conjoint Survey of
End-Use Customers

Determine Utilities for Attributes

Simulate Shares of Preferences

Preferences through a Conjoint Survey

Pay on Performance

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
\$.25	\$.50	\$.75	\$1.00	\$2.00	\$4.00

Notice:	1hr	2hr	3hr	4hr
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Exposure:	24hrs	8am-8pm	noon-7pm	1pm-5pm
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Duration:	24hrs	16hrs	10hrs	5hrs	2hrs
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#/week:	7	5	4	2
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Hours/period:	140	100	50	25
----------------------	------------	------------	-----------	-----------

#/period:	18	16	12	8
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Preferences through a Conjoint Survey

Penalty

\$0.00
 \$0.25
 \$0.50
 \$0.75

Option Payment

\$16
 \$24
 \$36
 \$40
 \$200
 \$400

Notice:	1hr	2hr	3hr	4hr	
Exposure:	24hrs	8am-8pm	noon-7pm	1pm-5pm	
Duration:	24hrs	16hrs	10hrs	5hrs	2hrs
#/week:	7	5	4	2	
Hours/period:	140	100	50	25	
#/period:	18	16	12	8	

Thanks folks!