

Project Prioritization

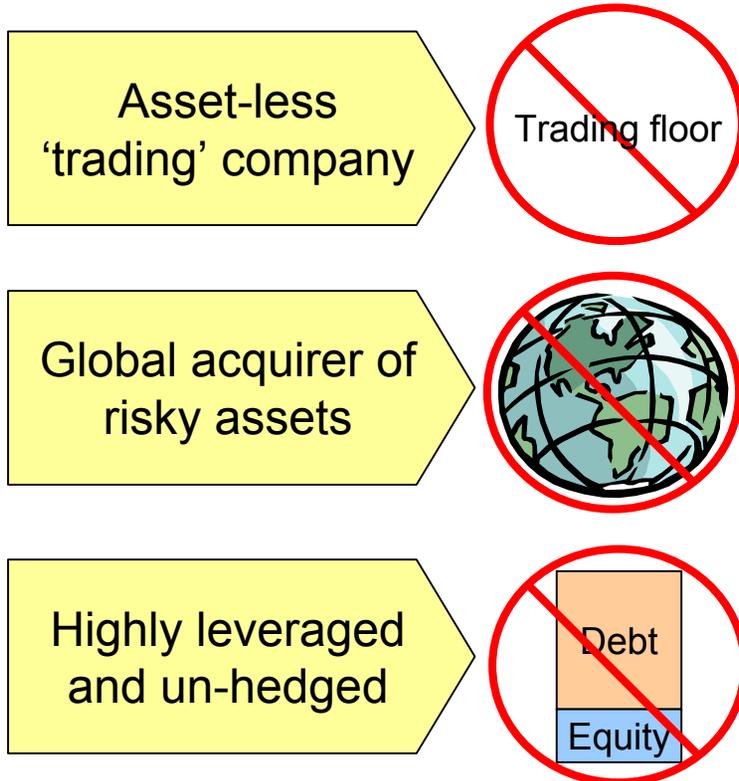
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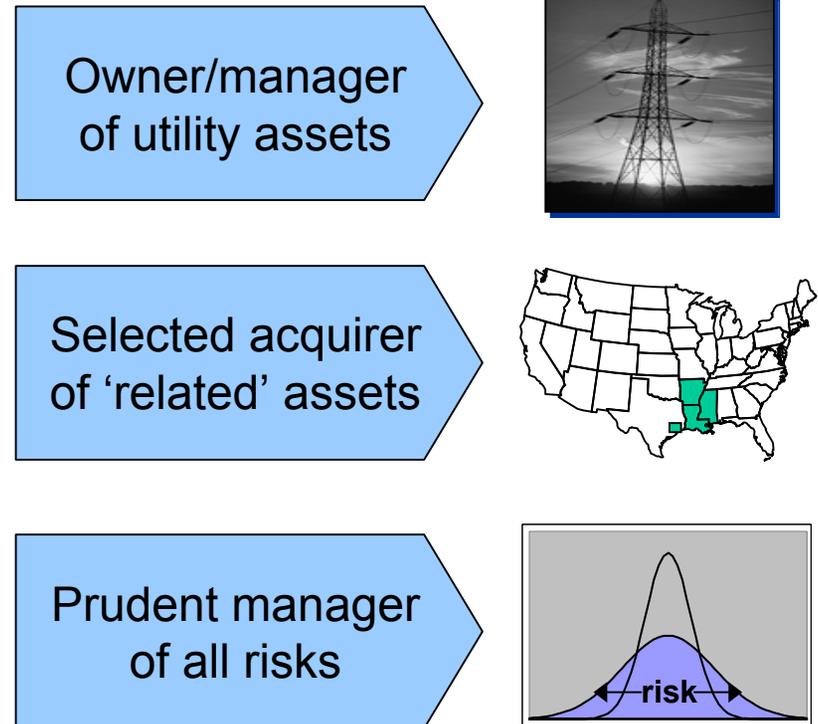
Today's utility has to have a different story to tell investors

The shift is from global energy traders to regional asset owner/managers

Who we are NOT:



Who we ARE:



The capital prioritization process has become a board-level issue *Boards want to see what is driving the business' needs for cash*

“The board of directors has asked to see the process by which we make decisions about major commitments of capital”

– A major multi-region investor-owned utility

“The board wanted to get behind the presentation of the budget and look at the drivers of cost and where it was taking us”

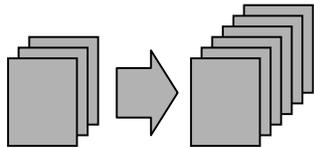
– A large southwestern municipal

“The board is not satisfied with a process where we all get in a room and use our best judgment. They want to see a method.”

– A major northeast investor-owned utility

Capital prioritization is the heart of an asset management process

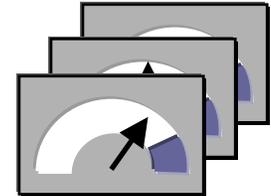
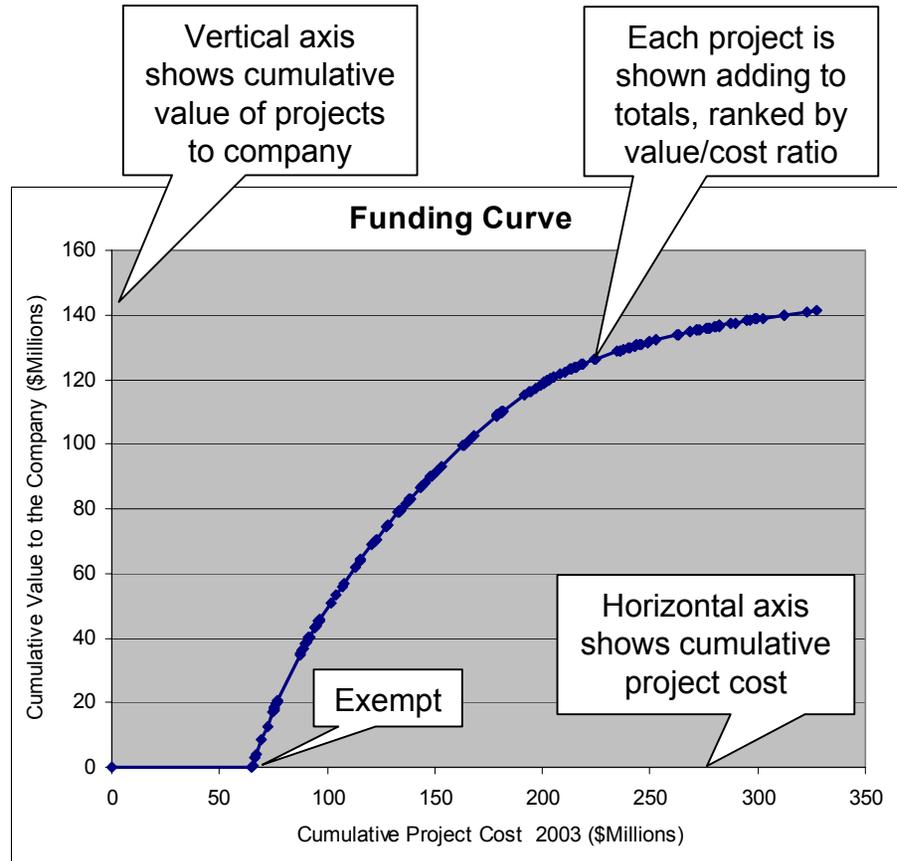
The 'funding curve' ranks each major project/option by its 'bang per buck'



Option Development

Developing cost-effective alternatives for possible funding

- Additions
- Upgrades
- Replacement
- Maintenance
- Standards
- Systems



Results Monitoring

Measuring & managing the drivers of the funded projects and processes

- Benchmarking
- Unit costs
- Failure rates
- Event impacts
- Value added

Recently, Pepco developed its 'funding curve' for the 2003 budget *Using Navigant Consulting's Asset Management Decision Model approach*

The Challenge

After the company sold its generation assets (with NCI help), it needed to re-focus its regulated operations around an Asset Management approach to Power Delivery, starting with a combined T&D Capital Budgeting Process.

The Approach

NCI worked with over 70 Pepco personnel to develop and implement for the 2003 Budget an Asset Management Decision Model. The model includes over 100 major projects:

- Customer Driven
- Load relief
- Substation reliability
- Feeder reliability
- General (IT, telecom, etc.)

Each project is modeled for cost and value, and then ranked by 'bang per buck' to allow resource allocation and prioritization.



The Result

The company is pleased with its progress toward implementing an Asset Management approach to Power Delivery. Several very costly projects have been deferred or cancelled and others have been given higher priority, due to the effective calculation of 'bang per buck' for each project.

The model is driven by system data, parameters, and project data

Modeled in Excel, users navigate to spreadsheets from a master menu

System data and parameters

Modeling of each project by type

Outputs of the model

Worksheets in Model		
Model Data	Project Types / Calculations	Model Outputs
<p>Introduction</p> <p>Text discussion of model.</p>	<p>Customer Driven</p> <p>"Customer Driven" modeled projects.</p>	<p>Funding Curves</p> <p>Funding curve project data worksheet.</p>
<p>Parameters</p> <p>Input parameters for individual projects in the model.</p>	<p>Load Relief</p> <p>"Load Relief" modeled projects.</p>	<p>Value Calculation</p> <p>Present value and terminal value calculations for all modeled projects.</p>
<p>Project Templates</p> <p>Templates for each project type.</p>	<p>Substation Reliability</p> <p>"Substation Reliability" modeled projects.</p>	<p>O&M Spending</p> <p>O&M spending worksheet.</p>
<p>10 Year Forecast</p> <p>10 year construction budget, with color-coding of exempt and modeled projects.</p>	<p>Feeder Reliability</p> <p>"Feeder Reliability" modeled projects.</p>	<p>Capital Spending</p> <p>Capital spending summary worksheet.</p>
<p>Substations</p> <p>List of substations with relevant design information.</p>	<p>General Programs</p> <p>List of "General" projects.</p>	<p>Revenue Requirements</p> <p>Revenue requirements worksheet.</p>
<p>LVAC Networks</p> <p>List of LVAC networks, with capacity and load forecasts.</p>	<p>Exempt Programs</p> <p>List of projects exempt from modeling.</p>	<p>Customer Satisfaction</p> <p>Customer satisfaction calculations for the feeder reliability projects.</p>
<p>Feeders</p> <p>List of feeders, with load, capacity and reliability data</p>	<p>Add A Project</p> <p>Instructions on how to add a new project.</p>	<p>Responsive Reaction</p> <p>Responsive reaction calculations for the feeder reliability projects.</p>
<p>System Map</p> <p>Map of system, with substations and transmission lines</p>		<p>Graphs</p>

Each project is modeled from cost to impacts to value

		<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>
<u>13kV Switchgear Refurbishment</u>	D0225				
Annual Project Cost	D0225	\$500,000	\$510,000	\$520,200	\$530,604
Refurbishment Cost per Breaker	D0225	\$5,000	\$5,100	\$5,202	\$5,306
Breakers Replaced per Year		100	100	100	100
Cumulative Breakers Replaced		100	200	300	400
<u>Collateral Damage Avoided Cost - Circuit Breakers</u>					
Old (Replaced) 13kV Circuit Breaker Failure Rate	D0225	3.0%	3.0%	3.0%	3.0%
New 13kV Circuit Breaker Failure Rate		0.1%	0.1%	0.1%	0.1%
Reduction in Failure Rate		2.9%	2.9%	2.9%	2.9%
Number of Circuit Breaker Failures Avoided per Year	D0225	2.9	5.8	8.7	11.6
Collateral Damage Cost per Failure (Weighted Average)	D0225	\$100,000	\$102,000	\$104,040	\$106,121
		\$290,000	\$591,600	\$905,148	\$1,231,001

Start by entering cost by year...

...then model units and unit costs...

...then model immediate impacts on value 'drivers'...

...e.g, one component of value is collateral damage avoided cost

For each project, the value from each of the components is added up by year, discounted to present value, and compared to the present value of the projects' cost, to get a value/cost ratio, which determines its ranking in the funding curve:

PV of project value / PV of project cost = Value/Cost ratio
\$2,200,000 / \$2,000,000 = 1.10

Pepco's decision model is *not* a 'point scoring' system

All impacts are brought back to dollars of value to the company

<u>Type of impact</u>	<u>Translation to value</u>	<u>Typical Value</u>
Customer Interruption	Restore & remediate	\$100 each
Switchgear failure	Restoration/damage cost	\$100,000
45MVA Network failure	Network event cost	\$10,000,000
100 MVA Substation failure	Significant event cost	\$50,000,000
800MVA Substation failure	Major event cost	\$250,000,000

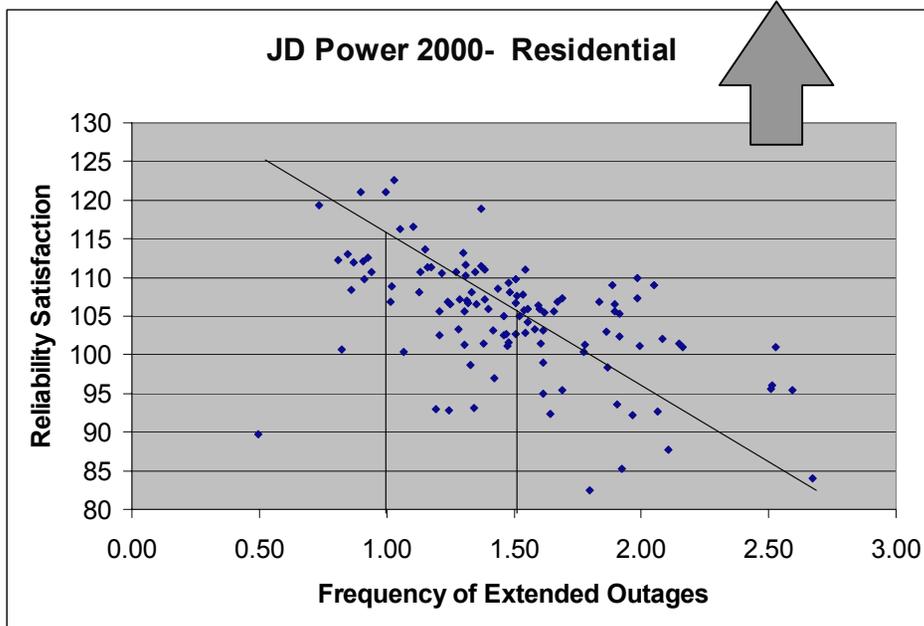
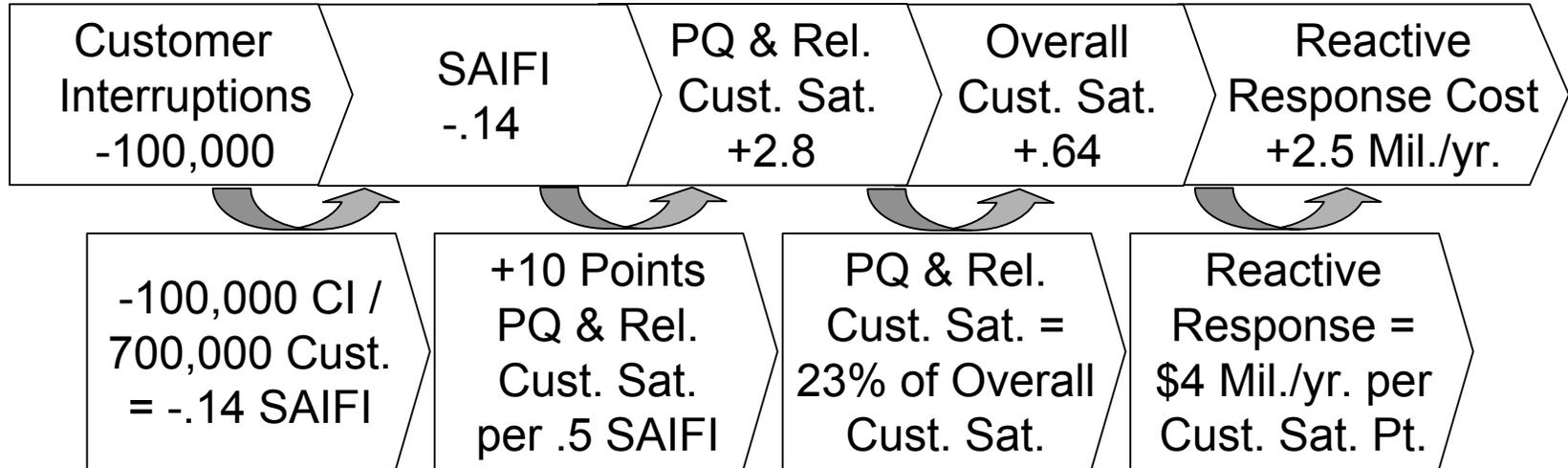
Ask yourself: Would I spend \$25,000,000 to reduce the chance of 'losing' an 800 MVA substation from one in ten years to one in twenty years?

'Event' definition: Forced, publicly visible, avoidable multiple-day loss of most load, e.g.,

- Losing a major secondary network for multiple days in the summer due mainly to overload
- Losing a substation/bus feeding major public facilities, with multiple failed restoration attempts

The decision model values avoiding customer interruptions

At a value to the utility of about \$25 per customer interruption per year



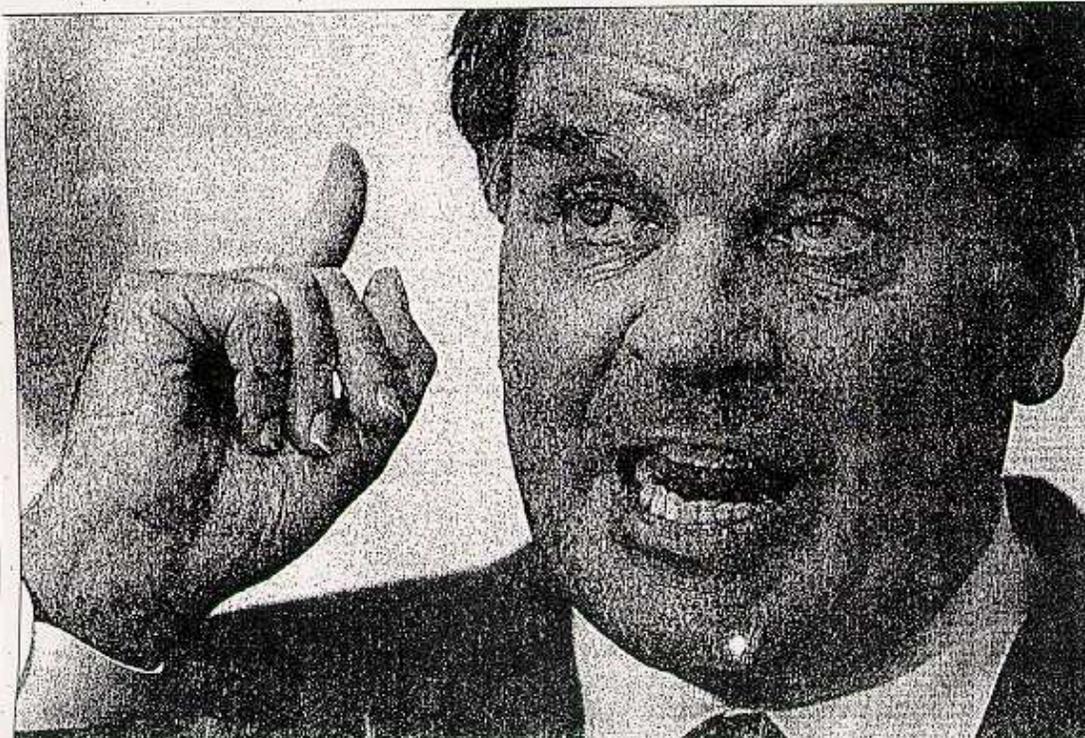
I.e., a 10-point drop in utility's customer satisfaction would require a \$40 million response by utility

The responsive reaction costs are real, even if approximate
Companies pay real dollars to deal with customer satisfaction issues



DOWNTOWN BLACKOUTS

Power fails, sparks fly



"They have neglected their infrastructure for too long... We are sick and tired of them, and they had better change."

Mayor Richard Daley



Image courtesy of CLTV

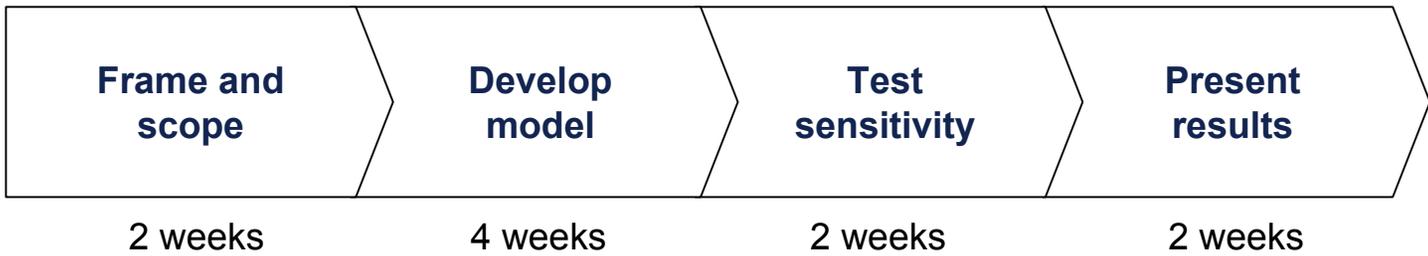
"This level of service under these conditions is a disgrace to us. It's a personal disgrace to me. I will not tolerate it, and you will not have to."

Features of the Pepco/Navigant Consulting approach

1. **Not a point scoring** system – translates impacts into value to the company
2. **Fact-based** – Not a ‘beauty contest’ – value relates to estimates of ‘real money’
3. **Facilitates senior-level review** – With unit costs, failure rates, impacts, etc.
4. **Encourages alternatives** – Break up expensive ‘system’ projects, do ‘worst first’
5. **Identifies accountability** – If project ‘wins’ funding, cost/performance is expected
6. **Ensures data quality** – “Better an approximate answer to the right question than...”
7. **Uses industry experience** – Values for parameters are related to industry data
8. **Organizationally flexible** – Doesn’t require new titles, org charts, legal entities
9. **Speed** – Can get a model developed in 10 weeks, ready for use in budgeting
10. **Scalable and extensible** – Same approach works for generation, gas, mergers

The workplan uses a proven, decision-analytic approach

Then, Pepco used the model over the summer to develop its 2003 budget



The workplan is a variant of an approach that has been used successfully for years:

- **Frame and scope** – Get clear about what’s in, what’s out, what matters, and why
- **Develop model** – Model each type of project, populate the templates with real examples
- **Test sensitivity** – Check the results, varying key parameters within ranges; ‘sanity-test’
- **Present results** – Present results to participants and senior management. Fine-tune

Pepco involvement in the model customization has been extensive

General Managers:	Jay Demarest, Bill Gausman, Mike Maxwell, Steve Taylor
Project team:	John Healy, Gary Keeler, Ron Marth
Principal Engineers:	Malcolm Thaden, Paulette Payne, Dick Kafka
Asset Mgt. Mgrs.:	Basil Allison, Eileen Appuglies, Les Grant, Chet Knapp, Joe Schall, Mark Weiss; Glenn Timmons (Transmission Services)
Field Services Mgrs.:	Richard Armstrong, Bob Dempsey, Tom Pierpoint
Asset Management:	Hayden Alexis, Ebenezer Botchway, Bob Brown, Roger Cheek, Chih Chow, Al Crumpler, Bob Dickey, Karim Fall, Howard Gibbs, Dee Gottman, Dave Gould, Mostafa Hassani, Bill Howell, Denise Johnson, Dwayne Kerr, Pat Kurowski, Tatjana Lalovic, Mason Mattox, Zinn Morton, Anne Morgan, Ramchand Persaud, Bill Snodgrass, Jane Verner, Brad Zellmer
Field Services:	Mary Pekat, John Wall, Mike Lizza, Jimmy Schreiber, Pat Byrne, Nathan Mcelroy, Mike Fekete, Steve Williams, Horace Ward, Mike Portale
Financial:	Lorraine Creely, Joel Garies, Dreama Gray, Don Holt, Brenda Jefferson, Avolon Joseph, Calvin Rice, Rob Stewart, Mike Speight, Rick Swink
Corporate:	Makini Street (Media), Tom Welle (Advertising), Jeff Piker (Research), Paul Harrington (Law), Mark Kumm (Pepco Energy Services), Ken Farrell (Meters), Akhlesh Kaushiva (IT)
	Total: 71

The result was a process that worked for Pepco

Decisions were made that should save money and improve performance

- **Cost savings** – A number of projects that had been considered for funding were re-prioritized out of the running due to clearer insight into their costs and benefits
- **Performance improvement** – Given the constraints on overall funding, using the model helped see how best to maintain/improve reliability for a given funding
- **Reduced risk** - By forcing estimation of the impacts of specific failures, the process focused thinking on key risk drivers and cost-effective solutions
- **Senior level review** – The results of the process went over well with Pepco's senior management and were used at special senior planning sessions
- **Participation** – Over 70 managers, engineers, and analysts participated in modeling the projects and reviewing the prioritization
- **Organization** – The process helped a new asset management organization work together and understand each other's roles and contributions
- **Information quality** – The process helped the organization focus on which key pieces of information needed to be improved to improve future decisions

Any questions?



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