

2017 Project Prioritization & Budgeting Process

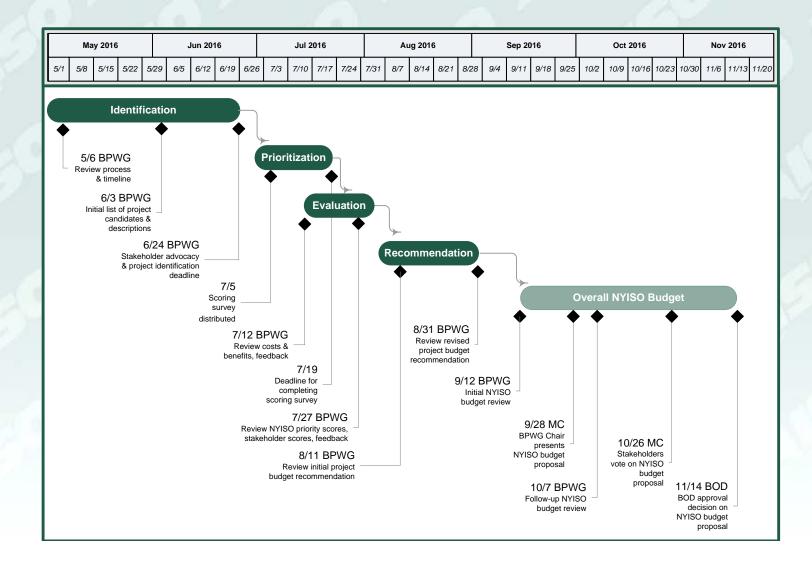
Ryan Smith Senior Manager New York Independent System Operator

Budget & Priorities Working Group July 27, 2016 Krey Corporate Center

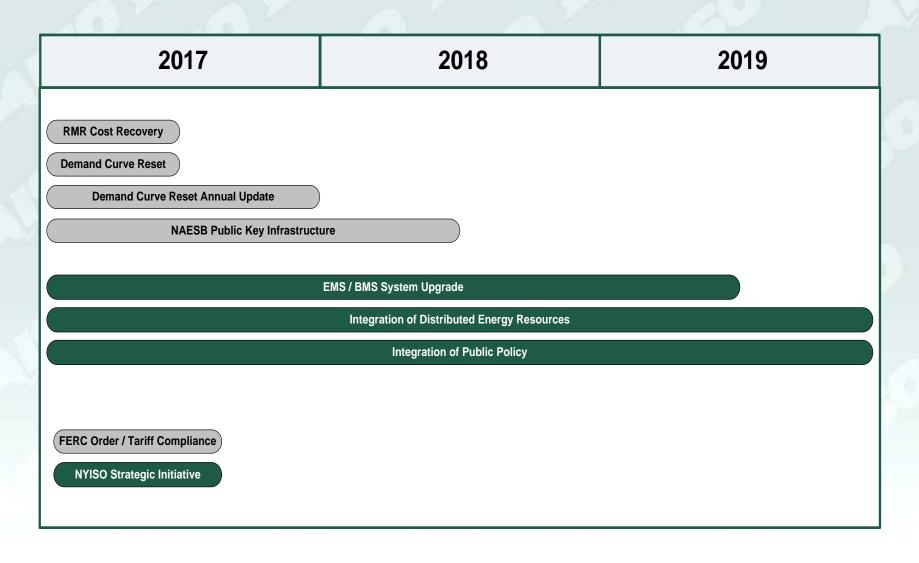
2017 Project Prioritization Process

Phase	Description
Identification	This phase involves developing the list of project candidates taking into consideration regulatory obligations, strategic initiatives, State of the Market recommendations, necessary infrastructure enhancements, product plans, stakeholder feedback, etc.
Prioritization	The phase involves the NYISO and stakeholder scoring of projects. The NYISO scores projects using objective criteria that reflects strategic alignment, expected outcomes, risks, and ability to execute. Stakeholders score projects based on their organizational priorities via a survey mechanism.
Evaluation	This phase involves performing a feasibility assessment based on detailed cost and labor estimates, dependencies, priority scores, and stakeholder feedback.
Recommendation	This phase involves proposing a feasible set of project deliverables and related budget requirements. The proposal is refined as needed based on stakeholder feedback.

2017 Project Prioritization Timeline



Strategic Initiatives & FERC Orders



Stakeholder Feedback

Feedback	NYISO Response
Request that both the State-of-Charge Management for Energy Storage and the Energy Storage Integration & Optimization Projects be considered "Continuing" projects.	These projects are not being classified as Continuing projects due to the fact these projects had not previously been initiated as stand-alone efforts.
Request to see total cost estimates for mandatory and continuing projects and by product area.	Total cost estimates by product area and for mandatory and continuing projects are included in this presentation on slide 6.
Question: Why is the Elimination of Capacity Zones more expensive than the On Ramps & Off Ramps for Zones?	Revised estimates are included in the presentation on slide 8.
Question: Is the cost too low on the Demand Curve Reset projects? Is no capital investment required?	The cost estimates are correct. We expect that the software changes can be accomplished by modifying existing software using internal labor and without any additional capital investment in hardware or software.
Limited Resource Performance Obligations was delayed and therefore should be back on the list as "Continuing" projects.	This is not being classified as a Continuing project due to the fact that the market design is not complete for this project and stakeholder priorities need to be reassessed after a long period of significant uncertainty on demand side programs.
Request that existing penalty provisions for SCRs be reviewed in conjunction with either the Distributed Energy Resource Program Design or the Limited Resource Performance Obligations project.	The NYISO envisions settlements, both incentives and penalties, being an important part of the DER Roadmap. This is intended to be in scope for the Distributed Energy Resource Program Design project.
Request that Changes to Selkirk Market Modeling project have a Market Design Complete deliverable rather than Concept Proposed.	The project deliverable for the Selkirk Market Modeling project has been updated to Market Design Complete as requested and cost estimates have been revised accordingly as identified in this presentation on slide 12.
Question: Why is the Public Policy Transmission Planning Process Acceleration project so expensive for a Concept Proposed deliverable.	The NYISO has concern about the feasibility of this project as described. The project description has been updated and cost estimates revised (slide 16) to reflect the cost of performing a comprehensive lessons learned effort upon completion of the Western New York Public Policy Transmission Planning Report with a goal of accelerating the planning cycles beginning in August 2018 and thereafter.

Cost Estimates by Product Area

	Labor Capital Prof. Services Total Mandatory Continuing 1.24 0.00 0.81 2.05 0.31 0.33 10.00 0.00 1.26 11.26 1.14 0.61 0.48 0.00 0.18 0.66 0.00 0.18 2.16 0.01 0.64 2.81 0.00 0.44 3.22 6.27 0.89 10.38 0.00 0.57										
Product Area	Labor	Capital		Total	Mandatory	Continuing					
Business Intelligence Products	1.24	0.00	0.81	2.05	0.31	0.33					
Capacity Market Products	10.00	0.00	1.26	11.26	1.14	0.61					
Demand Response	0.48	0.00	0.18	0.66	0.00	0.18					
Energy Market Products	2.16	0.01	0.64	2.81	0.00	0.44					
Enterprise Products	3.22	6.27	0.89	10.38	0.00	5.54					
Finance Products	2.49	0.10	0.25	2.84	0.00	0.57					
Operations and Reliability Products	5.35	1.60	10.62	17.58	0.00	16.00					
Planning Products	0.47	0.00	0.35	0.82	0.00	0.52					
TCC Market Products	0.53	0.01	0.50	1.03	0.00	1.03					
Total Cost	25.94	7.98	15.50	49.42	1.44	25.22					

	Priority Scores						Estima	ted Cos	_ `	lions \$)
Project	NYISO	Stake- holder		•	Sector Count	Deliverable	Labor	Capital	Prof. Serv.	Total
Business Intelligence Products										
Enterprise Information Management - Data Integration Phase III		СС	NTINUI	NG		Deploy	0.33	0.00	0.00	0.33
Customer Relationship Management Tool	237	51	24	6	3	Deploy	0.08	0.33	0.00	0.41
NAESB PKI Phase 2		MA	NDATO	RY		Deploy	0.31	0.00	0.00	0.31
Key Topics Tracking for Public Website	160	21	18	4	2	Deploy	0.07	0.00	0.00	0.07
Public Website Refresh	181	36	24	4	2	Architecture Design	0.15	0.00	0.30	0.45
Public Website Calendar	193	15	21	4	2	Architecture Design	0.05	0.00	0.00	0.05
Mobile Applications	146	15	20	3	2	Deploy	0.08	0.00	0.15	0.23
eTariff Webviewer Enhancements	175	53	38	10	2	Deploy	0.04	0.00	0.03	0.06
Secure Communications	186	16	17	3	2	Deploy	0.14	0.00	0.00	0.14

		Stake-		Org	Sector			ted Cos	Prof.	
Project Capacity Market Products	NYISO	<u> holder</u>	Weight	<u> Count</u>	Count	Deliverable	Labor	Capital	Serv.	Total
ICAP AMS Redesign & Testing Improvements Phase 1	479	77	47	9	4	System Design	0.44	0.00	0.00	0.44
RMR Cost Recovery Phase II		MA	NDATO	RY		Deploy	0.69	0.00	0.00	0.69
GADS Reporting	364	61	33	7	2	System Design	0.08	0.00	0.00	0.08
Modifications to GADS Reporting Software for IIFO	449	1	0	1	0	Deploy	0.02	0.00	0.10	0.12
Automate ICAP Import Rights	454	25	15	3	2	Deploy	0.10	0.00	0.00	0.10
Demand Curve Reset		MA	NDATO	RY		Study	0.04	0.00	0.06	0.10
Demand Curve Reset Annual Updates		MA	NDATO	RY		Deploy	0.25	0.00	0.10	0.35
Elimination of Capacity Zones (SOM)		СС	NTINUI	NG		Concept Proposed	0.61	0.00	0.00	0.61
On Ramps and Off Ramps for Zones	295	61	35	6	2	Concept Proposed	0.55	0.00	0.00	0.55
Dynamic Creation of Zones	215	91	72	7	2	Concept Proposed	0.71	0.00	0.00	0.71
Alternative Methods for Determining LCRs (SOM)	759	278	236	20	4	Market Design Complete	0.41	0.00	0.75	1.16

	Stake- Org Sector							ed Cost (in millions \$			
Project	NYISO	holder	Weight	Count	Count	Deliverable	Labor	Capital	Serv.	Total	
Capacity Market Products											
Incremental Enhancement to BSM Forecasts of ICAP Prices (SOM)	246	71	66	8	1	Concept Proposed	0.31	0.00	0.00	0.31	
Performance Assurance	546	54	70	7	2	Concept Proposed	0.16	0.00	0.25	0.41	
Incremental External CRIS Rights	263	61	25	3	1	Market Design Complete	0.57	0.00	0.00	0.57	
Capacity Transfer Rights for Internal Transmission Upgrades (SOM)	337	14	20	4	2	Concept Proposed	1.05	0.00	0.00	1.05	
BSM to Address Other Price Suppression Actions (SOM 5)	349	70	72	5	2	Concept Proposed	0.76	0.00	0.00	0.76	
Treatment of Capacity Exports from Localities (SOM 8)	723	41	69	7	4	Market Design Complete	1.02	0.00	0.00	1.02	
Economically Allocate Import Rights	330	1	0	1	0	Concept Proposed	0.83	0.00	0.00	0.83	
Fuel Assurance - Dual Fuel Requirements for Gas-Fired Generators	299	21	40	2	1	Concept Proposed	0.63	0.00	0.00	0.63	
Forward Capacity Market	350	149	110	11	4	Concept Proposed	0.23	0.00	0.00	0.23	
Integrating Public Policy	732	422	402	27	5	Study	0.56	0.00	0.00	0.56	

		Pric	prity Sco	ores			Estima	ted Cost	t (in mil	lions \$)
Project	NYISO	Stake- holder	Weight	•	Sector Count		Labor	Capital	Prof. Serv.	Total
Demand Response Products										
Business Objects Enhancements for DRIS Data	289	30	20	2	2	Deploy	0.06	0.00	0.00	0.06
Distributed Energy Resource Program Design		СС	NTINUI	NG	•	Concept Proposed	0.18	0.00	0.00	0.18
NYISO Pilot Framework	498	306	189	13	4	Market Design Complete	0.01	0.00	0.08	0.09
Granular Pricing & Market Price Delivery	373	61	52	7	3	Concept Proposed	0.03	0.00	0.00	0.03
Meter Data Policy	346	83	65	9	3	Study	0.06	0.00	0.10	0.16
State of Charge Management for Energy Storage	281	126.5	52	11	4	Development Complete	0.08	0.00	0.00	0.08
Limited Resource Performance Obligations: Evaluate Minimum Performance Obligation for Capacity Resources	344	183	184	13	5	Market Design Complete	0.06	0.00	0.00	0.06

	Priority Scores					Estima	ted Cost	•	lions \$)	
Project	NYISO		Weight	Org Count	Count	Deliverable	Labor	Capital	Prof. Serv.	Total
Energy Market Products										
ConEd/PSEG Wheel (SOM)		CC	NTINUI	NG		Deploy	0.26	0.01	0.12	0.39
Outage Analysis Tool	343	16	24	4	2	Study	0.07	0.00	0.00	0.07
Fuel Assurance - Constrained Fuel Supply Bidding (SOM)	642	44	58	6	4	Market Design Complete	0.03	0.00	0.00	0.03
ACD Dataset Reporting	138	1	0	1	0	Deploy	0.06	0.00	0.00	0.06
Integration of OFO status into SUEDE	102	1	0	1	0	Development Complete	0.14	0.00	0.00	0.14
Energy Storage Integration & Optimization	748	303.5	111	18	5	Market Design Complete	0.13	0.00	0.00	0.13
Quarterly Congestion Reporting	219	26	19	3	2	Deploy	0.13	0.00	0.00	0.13
Long Island PAR Optimization & Financial Rights (SOM)	339	36	36	7	3	Concept Proposed	0.10	0.00	0.00	0.10
Hybrid GT Pricing Improvements (SOM)		СС	NTINUI	NG		Functional Requirements	0.05	0.00	0.00	0.05
RTC/RTD Forward Horizon Coordination Improvements (SOM)	454	144	119	12	5	Functional Requirements	0.13	0.00	0.00	0.13
Review of RACT Compliance Plans (SOM)	345	9	8	3	1	Concept Proposed	0.07	0.00	0.00	0.07
5-Minute Transaction Scheduling (SOM)	291	90	19	4	2	Concept Proposed	0.05	0.00	0.00	0.05

			prity Sco				Estima	ted Cos		lions \$)
Project	NYISO	Stake- holder	Weight		Sector Count	Deliverable	Labor	Capital	Prof. Serv.	Total
Energy Market Products										
Model 100+KV Transmission Constraints (SOM)	568	227	141	13	4	Concept Proposed	0.05	0.00	0.00	0.05
Graduated Transmission Demand Curves (SOM)	471	146	34	6	2	Market Design Complete	0.03	0.00	0.00	0.03
Scarcity Pricing Tariff Revision	275	9	14	3	1	Deploy	0.06	0.00	0.22	0.28
Offer Cap Enhancement for FERC	254	71	35	3	1	Concept Proposed	0.05	0.00	0.00	0.05
Ontario Pricing	373	33	8	3	1	Market Design Complete	0.03	0.00	0.00	0.03
Reinstitute Import Guarantees	209	231	106	7	1	Concept Proposed	0.10	0.00	0.00	0.10
Eliminate Fees for CTS Transactions with PJM (SOM)	247	299	130	12	3	Concept Proposed	0.05	0.00	0.00	0.05
Changes to Selkirk Market Modeling	206	129	33	5	2	Market Design Complete	0.13	0.00	0.00	0.13
Fractional MW Load Bidding	195	99	12	6	2	Concept Proposed	0.05	0.00	0.00	0.05
Startup Cost Compensation	311	70	78	6	3	Concept Proposed	0.03	0.00	0.00	0.03
DAM Scheduling for ICAP Suppliers	240	43	42	7	4	Deploy	0.32	0.00	0.30	0.62

			ority Sco		1-		Estima	ted Cost		lions \$)
Project	NYISO	Stake- holder	Weight	Org Count	Sector Count	Deliverable	Labor	Capital	Prof. Serv.	Total
Enterprise Products										
Storage Infrastructure Redesign Phase III		cc	NTINUI	NG		Deploy	0.19	3.56	0.02	3.76
Database Platform Upgrade Phase II	254	1	0	1	0	Deploy	0.26	0.24	0.00	0.50
Telephony System Upgrade		CC	NTINUI	NG		Deploy	0.39	0.00	0.18	0.57
Application Platform Upgrade Phase IV		CC	NTINUI	NG		Deploy	0.70	0.39	0.12	1.21
Identity and Access Management - 2017	250	1	0	1	0	Deploy	0.53	0.00	0.00	0.53
Marketplace and Webforms Technology Upgrade	265	1	0	1	0	Deploy	0.16	0.00	0.02	0.18
Software AG Upgrade	322	1	0	1	0	Deploy	0.26	0.27	0.09	0.62
Backup Enhancements	415	1	0	1	0	Deploy	0.18	1.75	0.07	2.00
Application Testing Improvements	214	1	0	1	0	Deploy	0.42	0.00	0.22	0.64
Enterprise Job Scheduling Upgrade	333	6	5	2	1	Deploy	0.12	0.06	0.18	0.36

			ority Sco		Sector		Estima	ted Cost	t (in mil Prof.	lions \$)
Project	NYISO		Weight	•		Deliverable	Labor	Capital		Total
Finance Products										
North Subzone Redistricting		CC	NTINUI	NG		System Design	0.22	0.00	0.00	0.22
Rate Schedule 1 Technology Automation		CC	NTINUI	NG		Deploy	0.10	0.00	0.00	0.10
Day Ahead Margin Assurance Payment (DAMAP) Enhancements	NYISO holder Weight Count Count Deliverable Labor Capital Set Image: Set of the						0.00	0.06		
Settlements Sub Accounts	229	120	39	7	2	System Design	0.07	0.00	0.00	0.07
Sub Accounts with Unique Invoicing, Banking and Reporting	100	76	29	6	2	Deploy	0.82	0.00	0.00	0.82
Transmission Service Charges Rate Update		CC	NTINUI	NG		Deploy	0.20	0.00	0.00	0.20
Transactions Modifications & Confirmation Tool	263	6	9	2	1		0.09	0.00	0.00	0.09
Settlement at Sub-hourly Metering - Study	214	10	0	2	0	Study	0.03	0.00	0.00	0.03
Rate Schedule 12 Settlement	343	1	0	1	0		0.46	0.00	0.00	0.46
CMS/ ConInvoice Data Integration	263	1	0	1	0	Deploy	0.14	0.00	0.00	0.14
CMS Projected True-up Exposure Study	265	24	43	4	3	Study	0.01	0.00	0.00	0.01
Expense Reports Automation	211	1	0	1	0	Architecture Design	0.09	0.03	0.10	0.21
Financial Reporting Tools	193	1	0	1	0	Deploy	0.09	0.03	0.00	0.11
Contract Management	178	6	9	2	1	Architecture Design	0.12	0.05	0.15	0.32

		Pric	ority Sco	ores			Estima	ted Cos	t (in mil	lions \$)
Project	NYISO	Stake- holder			Sector Count	Deliverable	Labor	Capital	Prof. Serv.	Total
Operations & Reliability Products										
EPG PMU Simulator	365	13	8	3	1	Deploy	0.06	0.20	0.05	0.30
PMU Enhancements	315	13	8	3	1	Deploy	0.13	0.00	0.50	0.63
Smart Grid Visualization	223	19	8	4	1	Deploy	0.01	0.00	0.00	0.01
TOA Platform Upgrade Phase II		CC	NTINUI	NG		Deploy	0.23	0.20	1.04	1.47
EMS BMS System Upgrade		СС	NTINUI	NG		Development Complete	4.33	1.20	8.92	14.45
2017 Reference Level Software Enhancements	377	11	17	3	1	System Design	0.23	0.00	0.12	0.35
Gas Balancing Position Reporting	256	6	9	2	1	Deploy	0.03	0.00	0.00	0.03
FERC Funded Rerun - Phase 4		CC	NTINUI	NG		Deploy	0.09	0.01	0.00	0.09
SUEDE Front End Toolset	183	6	9	2	1	Deploy	0.26	0.00	0.00	0.26

	Priority Scores				Estimated Cost (in millions \$					
Project	NYISO	Stake- holder		•	Sector Count	Deliverable	Labor	Capital	Prof. Serv.	Total
Planning Products										
Solar Forecasting Initiatives	CONTINUING			Deploy	0.17	0.00	0.35	0.52		
Interconnection Process Review 2		435	470	24	5	Concept Proposed	0.20	0.00	0.00	0.20
Public Policy Transmission Planning Process Acceleration	232 417 273 21 5		5	Concept Proposed	0.10	0.00	0.00	0.10		

	Priority Scores				Estimated Cost (in millions \$)			
Project	Stake- NYISO holder		Sector Count		Labor	Capital	Prof. Serv.	Total
TCC Products								
TCC Balance-of-Period (TCC AMS, TCC AVS & CMS)	со	NTINUING		Deploy	0.53	0.01	0.50	1.03

Next Steps

- We will review an initial project budget recommendation at the August 11th BPWG meeting
- We will review a revised project budget recommendation at the August 31st BPWG meeting

Appendix A: Stakeholder Advocacy

Organization	Advocacy Position
Richard P. Felak	The number and gravity of the proposed changes listed under capacity market products is clearly indicative of the long- established fact that the NYISO's capacity market is irretrievably broken, convoluted, inscrutable, inefficient, counterproductive, and beyond help with so many layers of band aids that it has terminal gangrene under them. You're continuing to waste your time and money and most importantly flushing money down the drain that instead should be directed for the benefit of your most important customers i.e., end use consumers and the only way to make improvements is by completely redoing the capacity market from the ground up starting with a clean sheet. Aren't you glad you asked huh
Saracen Energy East LP	Utilizing the graduated transmission curves as outlined in the tariff should eliminate all of the constraint relaxation and offline GT practices impairing energy prices. / / Modeling of all 100kV and above facilities will improve energy prices significantly and bring NYISO operations to a standard utilized by neighboring RTO's. It will better manage network issues caused by changes in our future generation fleet. It will lower production costs and improve price transparency.
NextEra Energy Power Marketing, LLC	These are all particularly important issues, notably on storage integration and interconnection process review. Thanks for seeking comments on this survey.
Citigroup Energy Inc.	I didn't see any FTR or NODAL Virtual projects listed
DC Energy LLC	There were no virtual energy product enhancement alternatives in this survey. Many stakeholders favor expanding virtual bidding points to include generation nodes, there had been stakeholder discussion on this subject but that was not included here. We recommend such advancement be included in the next survey.
AES ES Holdings, LLC	AES ES Holdings, LLC appreciates the opportunity participate in the survey. We allocated 100% of our points to Energy Storage and Optimization (vs. splitting between multiple storage and DER related projects) because we believe that improving in front of the meter storage project market integration is the most immediate focus priority to maximize the technical capability of in front of the meter storage projects to improve reliability, lower carbon and lower costs on the grid. Once the optimization question is addressed, other "sub topics" such as state of charge management and behind the meter storage/DER can be detailed. In other words, if budget resources are limited, this project should be the first step before other related projects are launched.

Appendix A: Stakeholder Advocacy

Organization	Advocacy Position
Long Island Power Authority	> Transmission as reserve (excluded due to software update limitations) - impact should be studied before any software design can be done / > LI PAR Optimization - limit to changes within PAR tap change tolerance, including relative flows on parallel PARs / > Future consideration - measure and reduce systematic difference in DAM and RT gas burn (an effort that will be of increasing relevance as renewable penetration increases). / > For modeling key +100 kV constraints - do not require NYPA to change Niagara dispatch. /
CPower	CPower recommends that, in considering demand response projects for 2017, existing penalty provisions for SCRs be reviewed in conjunction with either the Distributed Energy Resource Program Design or the Limited Resource Performance Obligations proposed 2017 projects. Reviewing a more comprehensive set market rule changes applied to a given set of resources will result in greater market certainty for all stakeholders.
	Currently-implemented penalty calculations associated with, but not limited to, Incremental ACL, Provisional ACL, and RIP Portfolio shortfalls do not take into account the ICAP equivalent of UCAP offered, nor do they recognize actual event or test performance. Penalties are based solely upon the inability to demonstrate the enrolled Incremental or Provisional ACL. In many cases, these additional factors would eliminate the need for penalties. The addition of RIP shortfall penalties to individual SCR penalties results in overly punitive treatment of portfolios; consideration should be given to eliminating individual SCR penalties where possible. Minimum SCR kW thresholds for Change of Load/Change of Status (CoL/CoS) rules should be increased to better focus on larger resource performance; aggregate data reporting on the incidence of CoL/CoS violations would also be helpful. This effort would identify tariff and procedure changes needed to establish appropriate penalty calculation formulae.
	CPower recognizes that this initiative is not explicitly considered in the ongoing stakeholder prioritization of 2017 projects, but would like the project prioritization process record to indicate the importance of this effort to NY demand response providers. We appreciate the NYISO's consideration of this effort in 2017.
EnerNOC, Inc.	I understand that Dave Lawrence representing CPower reached out to you regarding considering existing penalty provisions for SCRs be reviewed in conjunction with either the Distributed Energy Resource Program Design or the Limited Resource Performance Obligations proposed 2017 projects. For all the reasons Dave provided, we fully support that. The penalty provisions are in serious need of reform and it was disappointing they weren't included in the survey.

Appendix A: Stakeholder Advocacy

Organization(s)	Advocacy Position
Energy Spectrum Inc.	Energy Spectrum recommends that, in considering demand response projects for 2017, existing penalty provisions for SCRs be reviewed in conjunction with either the Distributed Energy Resource Program Design or the Limited Resource Performance Obligations proposed 2017 projects. Reviewing a more comprehensive set market rule changes applied to a given set of resources will result in greater market certainty for all stakeholders.
	Currently-implemented penalty calculations associated with, but not limited to, Incremental ACL, Provisional ACL, and RIP Portfolio shortfalls do not take into account the ICAP equivalent of UCAP offered, nor do they recognize actual event or test performance. Penalties are based solely upon the inability to demonstrate the enrolled Incremental or Provisional ACL. In many cases, these additional factors would eliminate the need for penalties. The addition of RIP shortfall penalties to individual SCR penalties results in overly punitive treatment of portfolios; consideration should be given to eliminating individual SCR penalties where possible. Minimum SCR kW thresholds for Change of Load/Change of Status (CoL/CoS) rules should be increased to better focus on larger resource performance; aggregate data reporting on the incidence of CoL/CoS violations would also be helpful. This effort would identify tariff and procedure changes needed to establish appropriate penalty calculation formulae.
	Energy Spectrum recognizes that this initiative is not explicitly considered in the ongoing stakeholder prioritization of 2017 projects, but would like the project prioritization process record to indicate the importance of this effort to NY demand response providers. We appreciate the NYISO's consideration of this effort in 2017.
Alcoa, Inc., IBM Corporation, Occidental Chemical Corp., and Wegmans Food Markets	I do not like the description of the "Limited Resource Performance Obligations: Evaluate Minimum Performance Obligation for Capacity Resources." The NYISO needs to evaluate and improve its demand response programs, but I disagree that minimum performance requirements need to be increased, as assumed in the write-up. If anything, those requirements should be relaxed and made more flexible to enhance - rather than impede - participation in the programs.

The mission of the New York Independent System Operator, in collaboration with its stakeholders, is to serve the public interest and provide benefit to consumers by:

- Maintaining and enhancing regional reliability
- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policy makers, stakeholders and investors in the power system

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