2013 Project Prioritization and Budgeting Process

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    Strategic Initiatives and FERC Orders
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  - ***Cost/Benefit Analysis for 2013 Preliminary Project Candidates***

***New information since the September 7 BPWG meeting.**

Summary of Process and 2013 Proposed Budget

Summary of Process To Date

- **May 21 BPWG**
  - *Overview of 2013 Project Prioritization and Budgeting Process*
  - *Review of 2012-2014 Product Plan: NYISO Strategic Initiatives and FERC Orders*
- **June 20 BPWG**
  - *Review of 2013 Project Prioritization Criteria and link to NYISO Strategic Plan*
  - *Review of 2013 Preliminary Project Candidate List*
- **July 20 BPWG**
  - *Proposed Project Descriptions for 2013 Preliminary Project Candidates*
  - *Review of Prioritized 2013 Preliminary Project Candidate List and potential milestones*
- **August 22 BPWG**
  - *Proposed Project Descriptions for 2013 Preliminary Project Candidates*
  - *Review of Prioritized 2013 Preliminary Project Candidate List and potential milestones with cost/benefit analysis*
- **September 7 BPWG**
  - *Proposed Project Descriptions for 2013 Project Candidates*
  - *Proposed 2013 Project Budget*
- **September 19 BPWG**
  - *Proposed Project Descriptions for 2013 Project Candidates*
  - *Proposed 2013 Project Budget*
  - *Follow up on September 7 discussion*

Summary – 2013 Project Budget

- **The proposed project budget for 2013 is $25M, as compared to $20M in 2012**
- **Implementation of FERC Order 755 in 2012 required reprioritization of four projects from 2012 to 2013:**
  - ***Ancillary Services Mitigation***
  - ***Graduated Transmission Demand Curve***
  - ***Credit Management System: Energy Transactions Credit Enhancements***
  - ***DSASP Aggregations***
- **NYISO incorporated costs into the 2013 project budget previously reflected within baseline to provide Market Participants improved visibility into infrastructure-related efforts impacting NYISO's operations**
  - ***Enterprise Products in 2013: Nine Projects at $6.3M***
  - ***Enterprise Products in 2012: Six projects at 2.9M***
- **Eleven mandatory projects for an estimated cost of $7M – FERC Orders, strategic initiatives, tariff obligations and dependencies to support Orders, initiatives and obligations**
- **Changes to proprietary software to support NYISO Operations and market design changes are approximately $5.4 million**

Summary – Key Proposed Projects

- **Broader Regional Markets:**
  - ***CTS with ISO-NE (ordered by FERC in ER12-701-000)***
  - ***CTS with PJM***
- **Enhanced Scarcity Pricing**
- **Capacity Market Evolution:**
  - ***Additional Capacity Zones (required by FERC in ER04-449-000)***
  - ***ICAP Reference System***
  - ***Demand Curve Reset (required by Services Tariff § 5.14.1.2)***
- **Demand Response Evolution:**
  - ***DSASP Aggregations (required by Order No. 719)***
  - ***Market rule changes to Provisional Average Coincident Load***
  - ***Implementation of Monthly Net Benefits Test (required by Order No.745)***
  - ***Demand Response in Real Time Energy Market (required by Order No. 719)***

Summary – Key Proposed Projects – Cont.

- **Ranger Optimization and Performance Enhancements:**
  - ***Improves reliability and support of existing software by moving to the Mixed Integer Programming solution (MIPS)***
  - ***Increases constraint modeling flexibility***
  - ***Improves performance of the commitment analysis process***
  - ***Supports future BRM initiatives***
  - ***Supports future market design evolution***
  - ***Increases support for faster prototyping and development of market rules***
- **Essential Technology Upgrades, such as:**
  - ***Corporate Workstation Upgrades***
  - ***Market Job Scheduling Upgrade***
  - ***Network Reliability Upgrade***
  - ***Windows Server Upgrade***
  - ***Ranger Workstations Upgrade***
  - ***Ranger Software Upgrade***

September 7 BPWG Follow Up

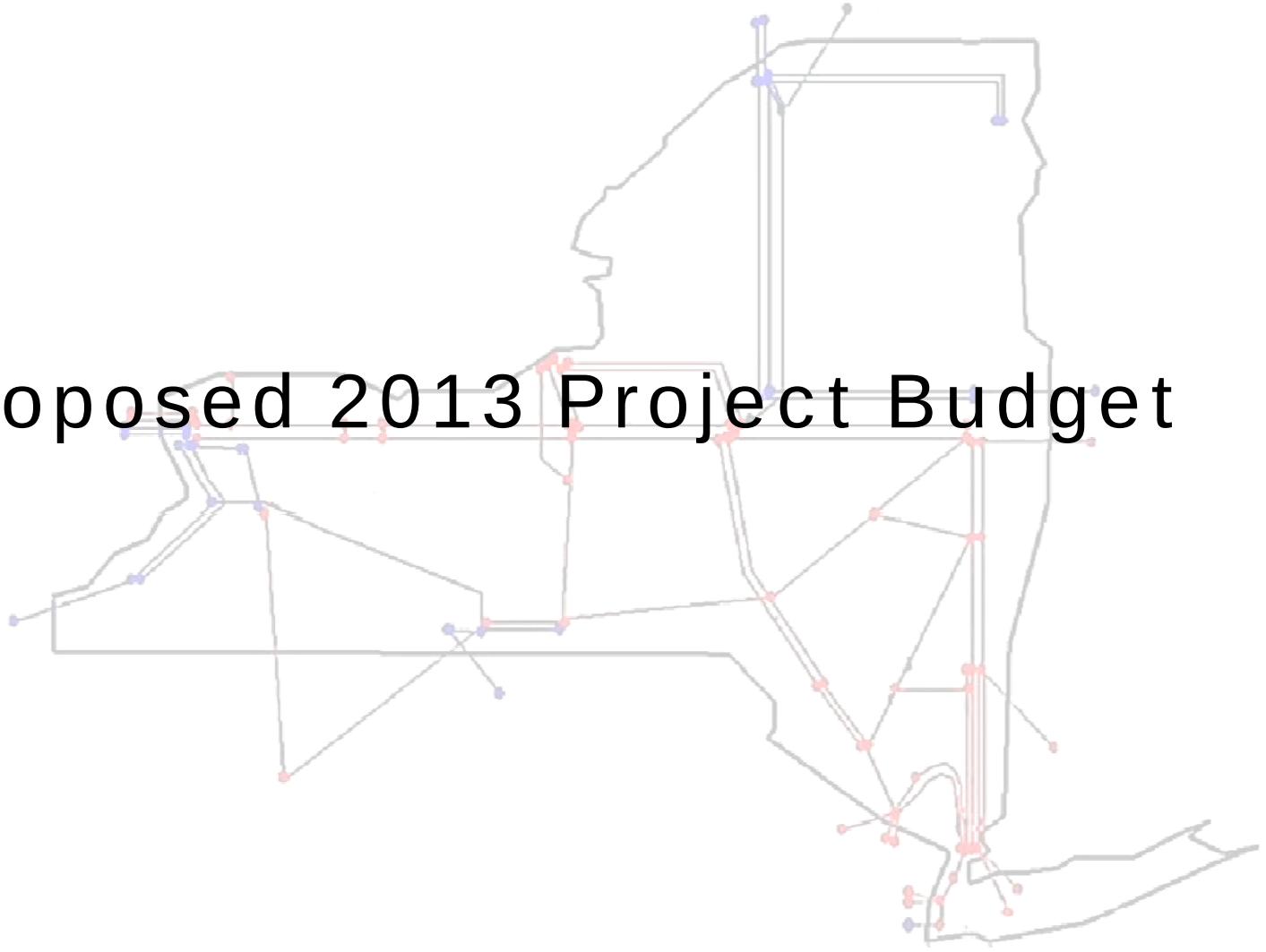
Follow Up Items

Stakeholder Input	NYISO Response
Request to see quantification of benefits of Mixed Integer Program (MIP) solution	• See presentation on benefits analysis presented by Tariq Niazi
Summary Slide on Page 20 – Request to see mandatory budget associated with each product area	• Incorporated on Slide 20

Project proposal to spend $1M from FERC Settlement in 2012 – Can the funds be spent on other projects proposed in the 2013 budget?	• Requirements for spending the $1M:
	  • Money is to be utilized for improvements in Market Surveillance
	  • The project proposal must be submitted for review and approval by FERC
	• Approximately 25% of the cost of the proposed project is money the NYISO would have needed to spend otherwise

Ranger Enhancements – do the proposed enhancements involve changes to the Security Constrained Unit Commitment (SCUC) process?	• The NYISO is not proposing to make changes to SCUC under this project

Proposed 2013 Project Budget



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Business Intelligence Products

	Proposed Deliverable	Strategic Objective	Estimated Cost (in millions)			
			NYISO Labor	Capital	Prof. Fees	Total
Project						
FERC Order 760 Automation*	Deployment	Authoritative Source of Information	$ .428	$ -	$ .150	$ .578
Business Intelligence Platform Design	Software Design	Leader in Technology Innovation	$ .196	$ -	$ .100	$ .296
DSS Business Objects Webi Migration	Deployment	Excellence in Execution	$ .136	$ -	$ -	$ .136
DSS Environment Upgrade	Deployment	Excellence in Execution	$ .296	$ -	$ .090	$ .386
eTariff Business Owner Assignment	Deployment	Excellence in Execution	$ .065	$ .070	$ .023	$ .158
NYS Generator Attributes Tracking System (GATS) Integration	Software Design	Authoritative Source of Information	$ .195	$ -	$ -	$ .195
Public Website: Marginal Unit Fuel Data	Software Design	Authoritative Source of Information	$ .057	$ -	$ -	$ .057
		TOTAL	**$ 1.373**	**$ .070**	**$ .363**	**$ 1.806**

***Mandatory = FERC Order, Strategic Initiative, Tariff Obligation, or Dependency To Support Order, Initiative, or Obligation**

Capacity Market Products

	Proposed Deliverable	Strategic Objective	Estimated Cost (in millions)			
			NYISO Labor	Capital	Prof. Fees	Total
Project						
Additional Capacity Zones*	Development Complete	Leader in Market Design	$ .563	$ -	$ -	$ .563
Demand Curve Reset*	Study Complete	Leader in Market Design	$ .108	$ -	$ .500	$ .608
GADS Portal	Software Design	Excellence in Execution	$ .062	$ -	$ .003	$ .065
ICAP Reference System	Software Design	Excellence in Execution	$ .242	$ -	$ -	$ .242
		TOTAL	**$ .975**	**$ .000**	**$ .503**	**$ 1.478**

***Mandatory = FERC Order, Strategic Initiative, Tariff Obligation, or Dependency To Support Order, Initiative, or Obligation**

Demand Response Products

	Proposed Deliverable	Strategic Objective	Estimated Cost (in millions)			
			NYISO Labor	Capital	Prof. Fees	Total
Project						
Demand Response - Real Time Energy Market*	Functional Requirements	Leader in Market Design	$ .142	$ -	$ -	$ .142
FERC Order 745: Monthly Net Benefits Test**	Deployment	Leader in Market Design	$ .178	$ -	$ -	$ .178
DSASP Aggregrations*	Deployment	Leader in Market Design	$ .106	$ -	$ -	$ .106
DRIS-SCR: Provisional ACL	Deployment	Leader in Market Design	$ .234	$ -	$ -	$ .234
SCR Baseline Study	Deployment	Authoritative Source of Information	$ .143	$ -	$ .075	$ .218
		TOTAL	**$ .803**	**$ .000**	**$ .075**	**$ .878**

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****NYISO currently awaiting FERC response to August 2011 Compliance Filing**

Energy Market Products

	Proposed Deliverable	Strategic Objective	Estimated Cost (in millions)			
			NYISO Labor	Capital	Prof. Fees	Total
Project						
Ancillary Services Mitigation	Deployment	Leader in Market Design	$ .054	$ -	$ -	$ .054
CTS –NE Phase 1: Internal System Build-out*	Development Complete	Leader in Market Design	$. 914	$ -	$ .650	$ 1.564
CTS – NE Phase 2: Activation*	Functional Requirements	Leader in Market Design	$ .491	$ -	$ -	$ .491
CTS-PJM	Market Design Approved	Leader in Market Design	$ .185	$ -	$ -	$ .185
Enhanced Scarcity Pricing	Deployment	Leader in Market Design	$ .299	$ -	$ .350	$ .649
Scheduling & Pricing: Graduated Transmission Demand Curve	Market Design Approved	Leader in Market Design	$ .080	$ -	$ -	$ .080
Scheduling & Pricing: Hybrid GT Pricing Improvements	Market Design Concept Proposed	Leader in Market Design	$ .016	$ -	$ -	$ .016
		TOTAL	**$ 2.039**	**$ .000**	**$ 1.000**	**$ 3.039**

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Enterprise Products

	Proposed Deliverable	Strategic Objective	Estimated Cost (in millions)			
			NYISO Labor	Capital	Prof. Fees	Total
Project						
Corporate Workstation Upgrades	Deployment	Excellence in Execution	$ .943	$ .150	$ .250	$ 1.343
Customer Relationship Management	Architectural Design	Excellence in Execution	$ .041	$ -	$ .100	$ .141
Enterprise Project Management Phase II	Deployment	Excellence in Execution	$ .294	$ .255	$ .475	$ 1.024
HR Business System	Deployment	Excellence in Execution	$ .033	$ -	$ -	$ .033
Identity and Access Management Phase III	Architectural Design	Excellence in Execution	$ .249	$ -	$ -	$ .249
Market Job Scheduling Upgrade	Deployment	Excellence in Execution	$. 228	$ .010	$ .150	$ .388
Network Reliability Upgrades	Deployment	Excellence in Execution	$ .113	$ 1.200	$ -	$ 1.313
Ranger Messaging Integration Phase II	Deployment	Leader in Tech. Innovation	$ .452		$ 1.110	$ 1.562
Windows Server Upgrade	Deployment	Excellence in Execution	$ .200	$ .070	$ -	$ .270
		TOTAL	**$ 2.553**	**$ 1.685**	**$ 2.085**	**$ 6.323**

Finance Products

	Proposed Deliverable	*Strategic Objective*	*Estimated Cost (in millions)*			
			NYISO Labor	*Capital*	*Prof. Fees*	*Total*
Project						
Credit Management System (CMS): Energy Transactions	Deployment	Leader in Market Design	$ .287	$ -	$ -	$ .287
CMS: Enhanced MP Data Access	Functional Requirements	Excellence in Execution	$ .138	$ -	$ -	$ .138
Data Retention Analysis	Study Complete	Excellence in Execution	$ .084	$ -	$ -	$ .084
ICAP Spot Market Credit Enhancements	Market Design Concept Proposed	Leader in Market Design	$ .018	$ -	$ -	$ .018
Oracle Financials Upgrade	Functional Requirements	Excellence in Execution	$ .121	$ -	$ .400	$ .521
Performance Tracking System Replacement	Deployment	Excellence in Execution	$ 390	$ -	$ -	$ .390
		TOTAL	**$ 1.038**	**$ .000**	**$ .400**	**$ 1.438**

Operations & Reliability Products

	Proposed Deliverable	Strategic Objective	Estimated Cost (in millions)			
			NYISO Labor	Capital	Prof. Fees	Total
Project						
Control Room Migration*	Deployment	Excellence in Execution	$ .152	$ .675	$ .085	$ .912
Dispatcher Training System (DTS) Sustainability	Functional Requirements	Leader in Reliability	$ .277	$ -	$ -	$ .277
Energy Management System (EMS) Visualization*	Deployment	Leader in Reliability	$ .360	$ .115	$ .710	$ 1.185
FERC Funded Market Rerun Capability Enhancements**	Deployment	Authoritative Source of Info	$ -	$ -	$ -	$ 1.000
HTP Controllable Tie Line	Deployment	Leader in Reliability	$ .100	$ -	$ -	$ .100
LI PAR Optimization	Market Design Concept Proposed	Leader in Reliability	$ .035	$ -	$ -	$ .035
MetrixIDR (Load Forecaster Upgrade)	Deployment	Leader in Reliability	$ .139	$ -	$ .100	$ .239
Phase I Metering Upgrade*	Deployment	Leader in Reliability	$ .212	$ .250	$ .350	$ .812
Reference Level Software (RLS) Enhancements	Deployment	Excellence in Execution	$ .181	$ -	$ .215	$ .396

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***Mandatory = FERC Order, Strategic Initiative, Tariff Obligation, or Dependency To Support Order, Initiative, or Obligation**
****Funds received from 2012 FERC settlement not included in NYISO's 2013 budget**

Operations & Reliability Products - Continued

	Proposed Deliverable	Strategic Objective	Estimated Cost (in millions)			
			NYISO Labor	Capital	Prof. Fees	Total
Project						
Ranger Enhancements	Deployment	Leader in Reliability	$ .183	$ -	$ .395	$ .578
Ranger Optimization & Performance Enhancements	Development Complete	Leader in Reliability	$ .256	$ .610	$ 3.100	$ 3.966
Ranger Software Upgrade	Development Complete	Leader in Reliability	$ .273	$ -	$ -	$ .273
Ranger Workstation Upgrade	Deployment	Leader in Reliability	$ .112	$ .300	$ -	$ .412
		TOTAL	**$ 2.280**	**$ 1.950**	**$ 4.955**	**$ 9.185**

Ranger Projects	Project Objective	Implementation Date	Cost
Ranger Enhancements	Modeling of 100kv lines and incorporation of interface limits to support new NERC modeling standards	Q1 2013	**$ .578**
Ranger Optimization & Performance Enhancements	Integration of the MIP code running on a coprocessor for the purpose of modeling flexibility and performance	Q2 2014	**$ 3.966**
Ranger Software Upgrade	Alignment of the software code with the hardware platform to match hardware life and improved compatibility with Windows 7	Q2 2014	**$ .273**
Ranger Workstation Upgrade	Implementation of Ranger Workstations to replace end-of-life hardware	Q4 2013	**$ .412**
TOTAL			**$ 5.229**

Planning and TCC Products

	Proposed Deliverable	Strategic Objective	Estimated Cost (in millions)			
			NYISO Labor	Capital	Prof. Fees	Total
Project						
High Performance Computing Redundancy	Deployment	Leader in Technology Innovation	$ .069	$ .100	$ -	$ .169
Multi-Duration Centralized TCC Auction Phase 2	Functional Requirements	Leader in Market Design	$ .302	$ -	$ -	$ .302
Siemens PTI Model-on-Demand Phase 2	Deployment	Robust Planning Processes	$ .084	$ .072	$ -	$ .156
TCC Auction Engine Upgrade	Software Ready	Leader in Market Design	$ .060	$ -	$ .075	$ .135
TCC Auction VB6 Validation Tool Replacement Phase 1	Deployment	Excellence in Execution	$ .300	$ -	$ -	$ .300
		TOTAL	**$ .815**	**$ .172**	**$ .075**	**$ 1.062**

Estimated Total Project Cost by Product Area

	($ in millions)				
Product Area	**NYISO Labor**	**Capital**	**Prof Fees**	**Total**	**Mandatory Budget***
Business Intelligence	$ 1.373	$ .070	$ .363	$ 1.806	$ .578
Capacity Market	$ .975	$ .000	$ .503	$ 1.478	$ 1.171
Demand Response	$ .803	$ .000	$ .075	$ .878	$ .426
Energy Market	$ 2.039	$ .000	$ 1.000	$ 3.039	$ 2.055
Enterprise	$ 2.553	$ 1.685	$ 2.085	$ 6.323	$ .000
Finance	$ 1.038	$ .000	$ .400	$ 1.438	$ .000
Operations and Reliability	$ 2.280	$ 1.950	$ 4.955	$ 9.185	$ 2.909
Planning and TCC	$ .815	$ .172	$ .075	$ 1.062	$ .000
Total Cost	$ 11.876	$ 3.877	$ 9.456	$ 25.209	$ 7.139*

***Mandatory = FERC Order, Strategic Initiative, Tariff Obligation, or Dependency To Support an Order, Initiative, or Obligation; these funds do not reflect projects required for necessary upgrades or projects necessary to mitigate undesirable risks**

Potential Projects for 2014 - 2015

The following list of projects are potential projects known currently that could be considered in the annual project prioritization and budgeting process for 2014 and 2015. NYISO will continue to incorporate additional project candidates based on feedback from MPs, FERC Orders, existing tariff obligations, strategic initiatives, State of the Market recommendations, and necessary infrastructure enhancements.

Potential Projects for 2014 – 2015

Leader in Market Design
Capacity Market Enhancements
Demand Curve Reset
Demand Response Enhancements
Demand Response in Real Time Energy Market
Disaggregated Virtual Trading
Dynamic Reserves
ITC Phase V: PJM Coordinated Transaction Scheduling
Market-to-Market Coordination: New England
Multi-Duration Centralized TCC Auction Phases 2 and 3
PAR Modeling Phase 2: Partially Controlling Mode
Reduced MW Offer Threshold for Demand Response
Solar Power Forecasting and Integration
Leader in Reliability
DRIS-SCR: 6-hour Performance and ACL Weather Adjustment
DRIS-SCR: Local Generators
TSC Enhancements

Potential Projects for 2014 – 2015 – Cont.

Excellence in Execution
Automation of Expense Reports
Compliance and Security Tool Enhancement
Corporate SAS Redesign
Credit Management System: Automation of Demand Response and Wholesale Transmission Service Charges
Customer registration via Website
Database Strategy (Oracle, SQL, PostgresSQL)
Development Environments with Markets
Document Mgmt / Search & Collaboration
DRIS-SCR: Multiple TO Account Numbers
DSS: MP Settlement Data Expansion
Effective Dating of NYISO Resource Models
Energy Market Mitigation Monitoring Tools
Enterprise Data Storage Management
Enterprise System Reliability Monitoring Enhancements
Expanded Functionality for Billing Simulator

Potential Projects for 2014 – 2015 – Cont.

Excellence in Execution
IT Service Management Capability Enhancements
MMA Data Mart Gap Analysis
Market and Web Application Server Upgrade
Market Participant Security Enhancements
Mitigation and Monitoring Enhancements
Mobile Device Management Upgrade
NYISO Market Performance Reporting Automation
Open ADR DR and Dynamic Pricing Technical Evaluation
Physical Security System Enhancements
Public Website Update: New Look
Public Website - Risk Mitigation
Reactive Power Test Data Collection and Tracking
SharePoint Application Migration (SharePoint 2010)
Weekly Invoice Automation of TCC Markets
Windows Account Update

Potential Projects for 2014 – 2015 – Cont.

Leader in Technology Innovation
Configuration Management Database Expansion
Data Integration Platform
Market and Settlement Data Management Phase 2
Public Website: Publishing Process
Authoritative Source of Information
Public Website - Maps & Graphs
Public Website - Posting Renewable Data

Next Steps

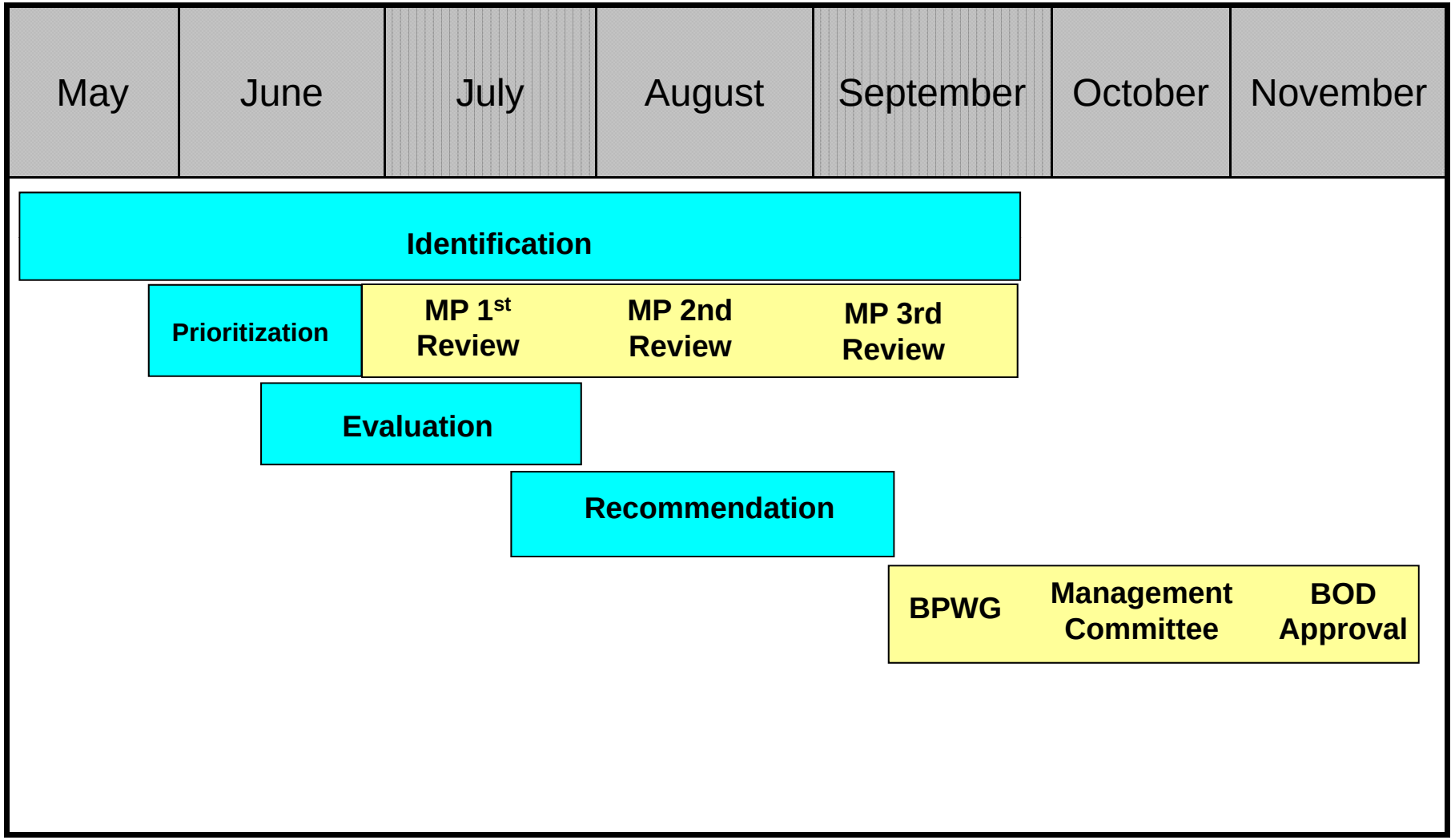
- **Further discussion, as needed**
  - ***October 5 BPWG***

Appendix A: 2013 Project Selection Process and Timeline

2013 Project Selection Process

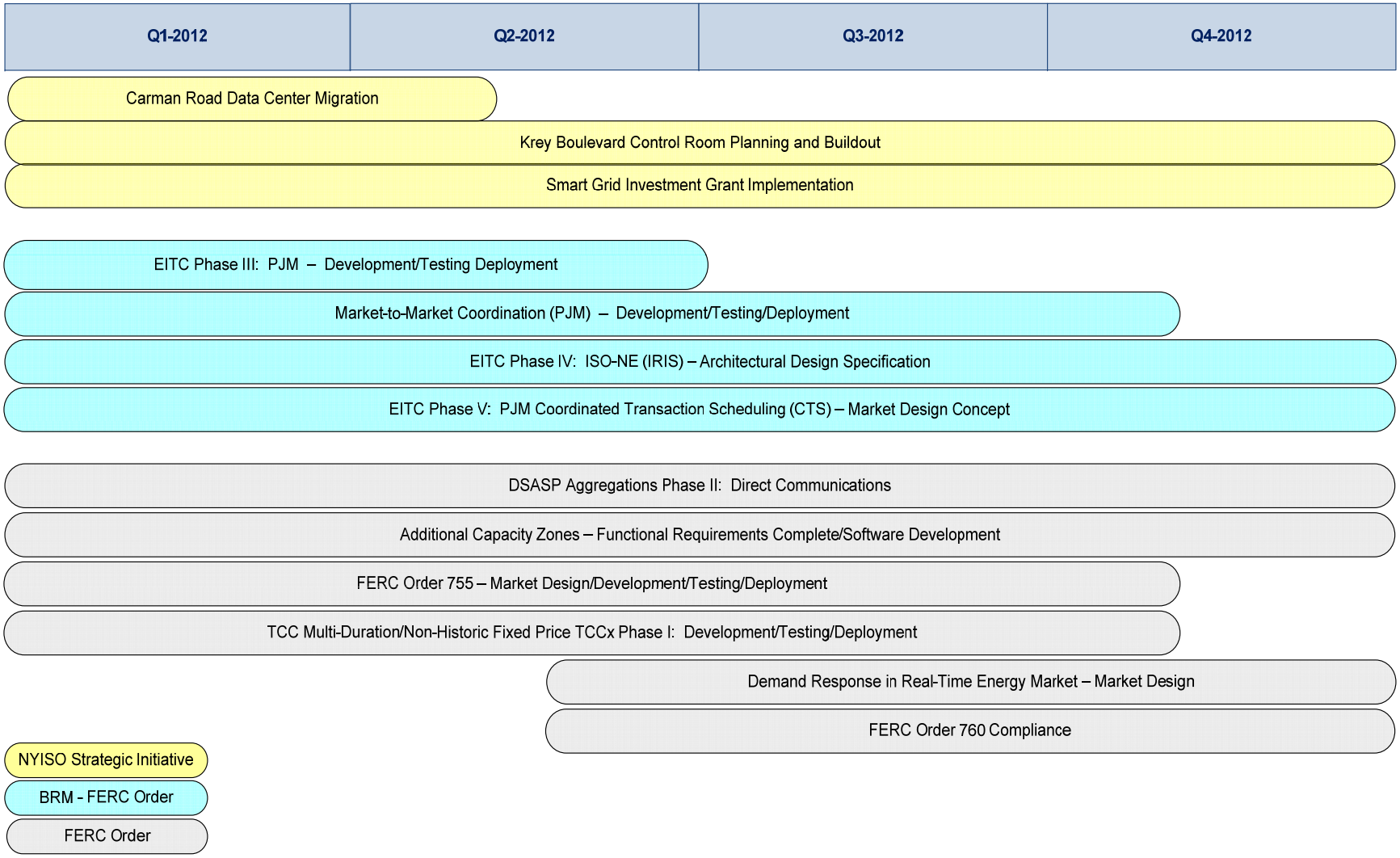
Phase	Definition
Identification	◆FERC Orders ◆Existing tariff obligations ◆Strategic Initiatives ◆State of the Market recommendations ◆Necessary infrastructure enhancements ◆Feedback from MPs throughout the year ◆Product Plans, Market Design Evolution and Strategic Plan
Prioritization	Evaluate projects using objective criteria that reflects the NYISO strategy, stakeholder interest, and potential impacts to budget and resources
Evaluation	Conduct feasibility assessment – detailed estimates of hardware, software, consultancy and staff
Recommendation	Refine 2013 proposed projects based on feasibility assessment

2013 Project Prioritization and Budgeting Timeline

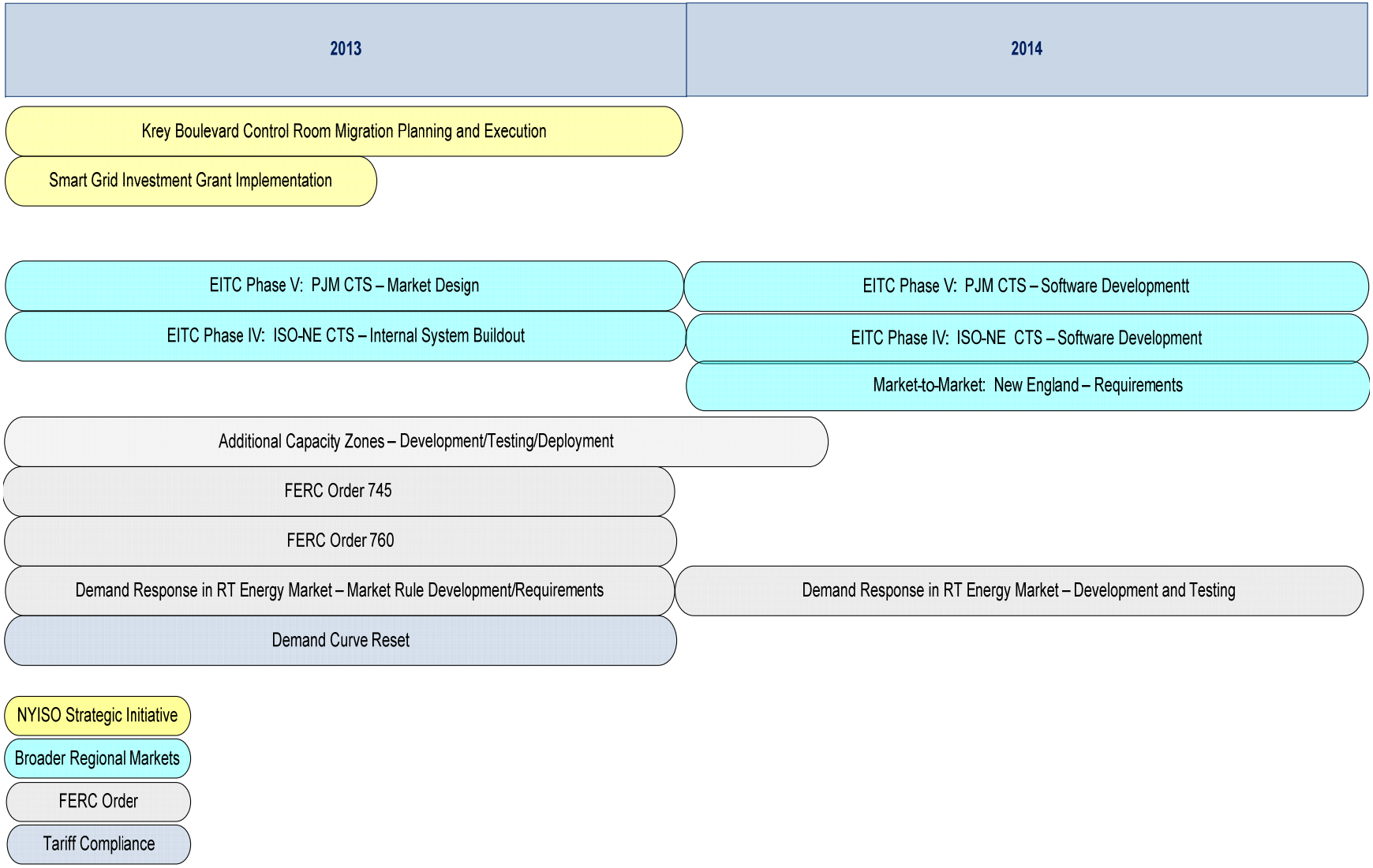


Appendix B: 2013 - 2015 Product Plan – Strategic Initiatives and FERC Orders

2012 Product Plan - Strategic Initiatives and FERC Orders



2013 - 2014 Product Plan - Strategic Initiatives and FERC Orders



Appendix C: Broader Regional Markets

BRM Estimated Timeline – As of Sept 2012

Project	2011 Deliverables	2012 Deliverables	2013 Deliverables	2014-2015 Deliverables	Post 2015 Deliverables
Buy Through of Congestion					Evaluation
ITC[1] Phase I: HQ on Dispatch	Deployment 15-Minute				Deployment 5-Minute
ITC Phase II: Ancillary Services				Evaluation	Deployment
ITC Phase III: PJM Intra-hour Transaction Scheduling		Deployment*			
ITC Phase IV: ISO-NE Coordinated Transaction Scheduling	Tariff Filing	Arch. Design	Development	Deployment	
ITC Phase V: PJM Coordinated Transaction Scheduling		Market Design Concept	Market Design	Deployment	
ITC Phase VI: OH Intra-hour Transaction Scheduling				Evaluation	Deployment
Market to Market Coordination: PJM		Deployment*			
Market to Market Coordination: ISO-NE				Requirement	Deployment[2]
Market to Market Coordination: MISO				Evaluation	
Market Flow Calculator (PJM M2M)	Deployment				
Market Flow Calculator (NERC IDC)	Deployment				
PAR Modeling Upgrades (updated proxy bus pricing)	Deployment				
Ranger Software Upgrade				Deployment	
Ranger Optimization and Performance Enhancements[3]			Dev. Complete	Deployment	

[1]ITC = Interregional Transaction Coordination

[2]ISO-NE has indicated it could not support a deployment of Market to Market Coordination prior to 2014

[3]Includes Mixed Integer Programming (MIP) algorithm in Security Constrained Unit Commitment (SCUC)

***Deployed & operational no later than January 15, 2013**

Estimated BRM Costs and Wholesale Market Benefits

IMPLEMENTATION		
Component	**Description**	**Total**
Market Design and Software Development Costs	Estimated total over six years (2010 – 2015)	$25 M
New Control Center at Krey Blvd.	1/3 of cost of new facility estimated to be approximately $36 million	$12 M
		$37 M
OPERATING COSTS		
6 FTEs 12 FTEs	$1 million per year for 2011 to support operations $2 million per year for 2012 – 2015 to support operations	$ 1 M $ 8 M
	Total Investment Upon Full Implementation	$46 M
ANNUAL BENEFITS*		
Total Estimated Savings	Upon implementation of all BRM initiatives	$193 M

COST RECOVERY: $46 M/$193 M = .24 or approximately 12 weeks

*Estimated savings per the **"**Analysis of the Broader Regional Markets Initiatives," David B. Patton, Ph.D., updated June 2010 and included with the NYISO's response to FERC on August 16, 2010."

Appendix D: 2013 Project Prioritization Criteria

2013 Prioritization Criteria

PRIORITIZATION CRITERIA							
#	Category	Criteria	Criteria Weight (1-10)	HIGH 10	MEDIUM 7	LOW 3	NONE 0
1	Strategy	Leader in Reliability	10	Significantly improves NYISO ability to maintain NYCA Reliability	Moderately improves NYISO ability to maintain NYCA Reliability	Minimally improves NYISO ability to maintain NYCA Reliability	None
2		Leader in Market Design	10	Significantly improves NYISO Market Design	Moderately improves NYISO Market Design	Minimally improves NYISO Market Design	None
3		Leader in Technology Innovation	6	Significantly advances the IT strategy or technology improvement	Moderately advances the IT strategy or technology improvement	Minimally advances the IT strategy or technology improvement	None
4		Sustain and Enhance Robust Planning Processes	9	Supports tariff, FERC, NPCC, or NYSERC compliance requirements	Supports reliability planning and/or Business Plan objectives	Required for SRP planning study efficiency or continuous improvement initiatives	None
5	Outcome	NYISO Annual Cost Reduction	10	>$500k savings-Direct and soft (labor)	>$100k, <$500k savings-Direct and soft (labor)	>$10k,<$100k savings - Direct and soft (labor)	<$10k savings - Direct and soft (labor)
6		Appeal	10	Broad Customer and NYISO desirability.	Desired by Customer	Desired by NYISO	Not Desired by Customer & Not Desired by NYISO
7		Market Efficiency	10	Significant improvement	Moderate improvement	Minimal improvement	No impact
8		Post Production Sustainability	5	Existing support structure and skills	Support structure exists but needs minimal modifications	Support structure exists but needs major modifications	No skills or support structure in place
9	Risk	Compliance	10	Significant risk of compliance violation	Moderate risk of compliance violation	Minimal risk of compliance violation	None
10		Business Process (inclusive of technology impact on business process)	10	Enterprise Wide and/or Bid to Bill Impact. The project impacts processes in most departments	Multiple Department Impact.	Department Wide Impact The project impacts many processes within a department	Only one or two processes impacted
11		Reliability and Market	10	Mission-critical systems becoming non operational or above $1 million market impact	Non mission-critical systems becoming non operational or $100,000 - $1 million market impact	Non mission-critical systems affected or $10,000 - $100,000 million market impact	No or less than 10,000 impact
		Sum	100				

Execution							
1	Execution	Cost	4	project, <$100k	>$100k, <$500k	>$500, <$1M	>$1M
2		Multi-Year Dependency	6	Continuation of a multi-year project - postponement significantly disrupts value of previous investments	Continuation of a multi-year project - postponement moderately disrupts value of previous investments	Continuation of a multi-year project - postponement minimally disrupts value of previous investments	None
3		Complexity of Business and Technology	4	One area/technology	Cross-functional < 3 Areas/Technology	Highly Cross-functional/ Re-engineering	Complex, solution and impact unknown
4		Compliance	10	Non-appealable, ordered by FERC / desired by NYISO and MP	Ordered by FERC, undesired by NYISO or MP	Potential order identified by FERC	No regulatory impact

Priority Scores

- **Individual projects scored against objective criteria**
- **Objective criteria aligned with NYISO Strategic Plan**
- **High level project descriptions utilized as a basis for potential scope for evaluation purposes**
- **Priority scores provide relative ranking for each project and an indication of where NYISO should concentrate its efforts on estimation and feasibility analysis**

Appendix E: Stakeholder Input

Stakeholder Input Following 5/21 BPWG

Stakeholder Input	NYISO Response
Any software changes necessary to enable a transfer of data to a GATS system	Project included for prioritization/evaluation in Business Intelligence Products
Disaggregated Virtual Trading	Project included for prioritization/evaluation in Energy Market Products
Ranger software changes to allow more pricing nodes and bid volume	Ranger Optimization & Performance Enhancements included in Operations & Reliability Products for prioritization/evaluation
Unbalanced Trading Hubs	Project included for prioritization/evaluation in Finance Products
Phase II of ICAP Bidding Requirements	Project included for prioritization/evaluation in Finance Products
Removing capacity zones determined to be no longer needed	NYISO is open to further exploring the development of criteria to eliminate existing or newly created zones
Phase II Improvements in Frequency Regulation	Frequency Regulation Compensation scheduled for October 2012; Phase II would require stakeholder discussions regarding enhancement opportunities based on Phase I outcomes

Stakeholder Input Following 5/21 BPWG

Stakeholder Input	NYISO Response
Internal dispatch/external import limits: trade-off for economics	Concept needs to be introduced by stakeholders at MIWG for discussion
Capacity Market Restructuring Proposals	Capacity Market Study under way with expected completion late summer 2012; results will be discussed with stakeholders at ICAPWG
Changes related to mothballed/retired generators	Topic to be addressed through stakeholder process
Modeling of excess capacity in Planning studies	Input forwarded to System Resource Planning group
Tariff changes related to the impact of potential gas supply outages under future electric system conditions to be conducted in conjunction with the reliability planning process	Input forwarded to System Resource Planning group
Improved bid mitigation notification	Input forwarded to Market Mitigation & Analysis
Additional storage for RLS attachments	Input forwarded to Market Mitigation & Analysis

APPENDIX F: 2013 PRELIMINARY PROJECT CANDIDATES - COST/BENEFIT ANALYSIS*

***All projects in the following list were evaluated on an individual basis according to priority, cost, resource availability and feasibility of implementation for 2013.**

Business Intelligence Products

	Proposed Deliverable	Strategic Objective	Priority Score	Estimated Cost (in millions)			Benefits
				NYISO Labor	Capital/ Consultancy	Total	
*Mandatory Projects**							
FERC Order 760 Automation	Deployment	Authoritative Source of Information	367	$ .428	$ .150	$ .578	• FERC Order • Reduced data requests from FERC
Projects for Prioritization							
Business Intelligence Platform Design	Software Design	Leader in Technology Innovation	225	$ .196	$ .100	$ .296	• Provide standardization of technology • Improved maintainability of BI systems
DSS Business Objects Webi Migration	Deployment	Excellence in Execution	158	$ .136	$ -	$ .136	• Improved maintainability of DSS • Allow for future BO upgrades
DSS Environment Upgrade	Deployment	Excellence in Execution	283	$ .296	$ .090	$ .386	• Improved maintainability of DSS • Reduced downtime
eTariff Business Owner Assignment	Deployment	Excellence in Execution	265	$ .065	$ .093	$ .158	• Allow for better internal visibility when tariff changes impact documentation
NYS Generator Attributes Tracking System (GATS) Integration	Development Complete	Authoritative Source of Information	421	$ .195	$ -	$ .195	• Pending NYS legislation • Support of NYSERDA project
Public Website: Maps and Graphs	Deployment	Authoritative Source of Information	207	$ .150	$ .075	$ .225	• Eliminate outdated/unsupported technology • Align with NYISO technology stack
Public Website: Marginal Unit Fuel Data	Software Design	Authoritative Source of Information	135	$ .057	$ -	$ .057	• Provide data requested by MPs • Improved transparency
Public Website: Technology Upgrade	Deployment	Excellence in Execution	213	$ .282	$ .080	$ .362	• Reduce licensing costs • Improve maintainability

***Mandatory = FERC Order, Strategic Initiative, Tariff Obligation, or Dependency To Support Order, Initiative, or Obligation**

Capacity Market Products

	Proposed Deliverable	Strategic Objective	Priority Score	Estimated Cost (in millions)			Benefits
				NYISO Labor	Capital/ Consultancy	Total	
*Mandatory Projects**							
Additional Capacity Zones	Development Complete	Leader in Market Design	725	$ .563	$ -	$ .563	• Reflect capacity values inside and outside SENY more efficiently • Incentivize new capacity more consistent with future reliability needs • Achieve long-term benefits of more efficient, locational investment decisions, including eliminating the deliverability barrier to building outside SENY
Demand Curve Reset	Study Complete	Leader in Market Design	590	$ .108	$ .500	$ .608	•Latest net cost of new entry estimates, providing the correct signals for market entry and exit.
Projects for Prioritization							
GADS Portal	Software Design	Excellence in Execution	553	$ .062	$ .003	$ .065	• Greater market functionality and ability for MPs to move away from spreadsheet based data submission • Potential elimination of errors associated with manual processes
ICAP Masked Bid Data Automation	Deployment	Excellence in Execution	353	$ .015	$ -	$ .015	• Potential elimination of errors associated with manual processes
ICAP Reference System	Software Design	Excellence in Execution	637	$ .242	$ -	$ .242	• Ensure the continued quality and accuracy of its administrative ICAP determinations

***Mandatory = FERC Order, Strategic Initiative, Tariff Obligation, or Dependency To Support Order, Initiative, or Obligation**

Demand Response Products

	Proposed Deliverable	Strategic Objective	Priority Score	Estimated Cost (in millions)			Benefits
				NYISO Labor	Capital/ Consultancy	Total	
*Mandatory Projects**							
Demand Response - Real Time Energy Market	Functional Requirements	Leader in Market Design	615	$ .142	$ -	$ .142	• FERC Order • Demand Response as an alternative supply resource
FERC Order 745: Monthly Net Benefits Test**	Deployment	Leader in Market Design	335	$ .178	$ -	$ .178	• FERC Order • Improved baseline methodology and cost allocation
2012 Project Continuation							
DSASP Aggregrations	Deployment	Leader in Market Design	633	$ .106	$ -	$ .106	• FERC Order • Reduced barriers for DR to provide Ancillary Services
Projects for Prioritization							
DRIS-SCR: Local Generators	Market Design Approved	Leader in Reliability	472	$ .037	$ -	$ .037	• Clarifies eligibility of behind-the-meter generators • Enables support for additional reporting requirements
DRIS-SCR: Provisional ACL	Deployment	Leader in Market Design	633	$ .234	$ -	$ .234	• Improvements to existing market rules and gaps identified by stakeholders to reduce barriers to participation
DRIS-SCR: 6-hour Performance and ACL Weather Adjustment	Market Design Approved	Leader in Reliability	438	$ .047	$ -	$ .047	• Improved reliability • Addresses performance measurement for weather-sensitive resources
SCR Baseline Study	Deployment	Authoritative Source of Information	338	$ .143	$ .075	$ .218	• Fulfill commitment to stakeholders • Evaluate additional measurement and verification options
Reduced MW Offer Threshold	Market Design	Leader in Market Design	275	$ .285	$ -	$ .285	• Facilitate participation by smaller demand response resources

Energy Market Products

	Proposed Deliverable	Strategic Objective	Priority Score	Estimated Cost (in millions)			Benefits
				NYISO Labor	Capital/ Consultancy	Total	
*Mandatory Projects**							
CTS –NE Phase 1: Internal System Build-out	Deployment	Leader in Market Design	637	$ .914	$ .650	$ 1.564	• $17 million (Estimated production cost savings – D. Patton – Potomac Economics, 2010)
CTS – NE Phase 2: Activation	Functional Requirements	Leader in Market Design	637	$ .491	$ .650	$ 1.141	• $17 million (Estimated production cost savings – D. Patton – Potomac Economics, 2010)
CTS-PJM	Market Design Approved	Leader in Market Design	365	$ .185	$ .050	$ .235	• $46 million (Estimated production cost savings – D. Patton – Potomac Economics, 2010)
2012 Project Continuation							
Ancillary Services Mitigation	Deployment	Leader in Market Design	240	$ .054	$ -	$ .054	• $1.4 - $4.4 million (Estimated production cost savings – D. Patton – Potomac Economics, 2010)
Scheduling & Pricing: Graduated Transmission Demand Curve	Deployment	Leader in Market Design	420	$ .080	$ -	$ .080	• Improved price signals • More efficient scheduling • Reduce residuals
Projects for Prioritization							
Disaggregated Virtual Trading	Deployment	Leader in Market Design	165	$ 1.735	$ .850	$ 2.585	• $2 million (Estimated production cost savings – D. Patton – Potomac Economics, 2010) • Improved market efficiency • Enhanced market functionality
PAR Modeling Phase 2: Partially Controlling Mode	Functional Requirements	Leader in Market Design	265	$ .128	$ -	$ .128	• Improved market efficiency
5 minute Transaction Scheduling HQ	Deployment	Leader in Market Design	235	$ .427	$ 2.000	$ 2.427	• Improved price signals • More efficient scheduling • Reduce residuals
Scheduling & Pricing: Hybrid GT Pricing Improvements	Market Design Concept Proposed	Leader in Market Design	235	$ .016	$ .050	$ .066	• Improved price signals • More efficient scheduling • Reduce residuals

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Enterprise Products

	Proposed Deliverable	Strategic Objective	Priority Score	Estimated Cost (in millions)			Benefits
				NYISO Labor	Capital/ Consultancy	Total	
Projects for Prioritization							
Corporate Workstation Upgrades	Deployment	Excellence in Execution	352	$ .943	$ .400	$ 1.343	• Maintain product support for NYISO laptops and desktops • Mitigate security risks in Windows XP • Address browser compatibility issues with external access to NYISO markets
Enterprise Data Storage Management	Deployment	Excellence in Execution	277	$ .148	$ .750	$ .898	• Improve backup efficiencies for Windows servers • Enable testing of patches to alleviate production patching risks
Enterprise Project Management Phase II	Deployment	Excellence in Execution	307	$ .320	$ .730	$ 1.050	• Visibility into enterprise resource allocation and capacity • Data driven prioritization and scheduling trade off analyses • Contain schedule risk related to project delivery commitments
Enterprise System Reliability Monitoring Enhancements	Deployment	Excellence in Execution	167	$ .185	$ .230	$ .415	• Enhance monitoring of critical IT applications and infrastructure • Improve reporting for IT system resource and capacity planning
HR Business System	Deployment	Excellence in Execution	187	$ .027	$ -	$ .027	• Improve HR process efficiencies • Optimize integration with other NYISO systems • Reduce replication of data maintenance across multiple systems
Identity and Access Management Phase III	Architectural Design	Excellence in Execution	305	$ .300	$ -	$ .300	• Maintain product support • Enhance security of critical cyber assets

Enterprise Products

	Proposed Deliverable	Strategic Objective	Priority Score	Estimated Cost (in millions)			Benefits
				NYISO Labor	Capital/ Consultancy	Total	
Projects for Prioritization							
Market Data Management	Deployment	Excellence in Execution	512	$ .406	$ .100	$ .506	• Reduce risk through improved data recovery capability • Reduce NYISO labor support costs
Market Job Scheduling Upgrade	Deployment	Excellence in Execution	368	$ .228	$ .160	$ .388	• Maintain product support for essential market scheduling functions • Improve system stability and reliability
Market and Web Application Server Upgrade	Architectural Design	Excellence in Execution	228	$ .099	$ .235	$ .334	• Maintain product support for NYISO market application hardware • Potential to decrease patching maintenance outage durations
Mobile Device Management Upgrade	Architectural Design	Excellence in Execution	295	$ .122	$ .125	$ .247	• Decrease the risk of being solely dependent on one vendor • Improve flexibility of NYISO communication systems
Network Reliability Upgrades	Deployment	Excellence in Execution	368	$ .113	$ 1.200	$ 1.313	• Maintain product support for essential networking equipment • Improve performance of NYISO network
Ranger Messaging Integration Phase II	Deployment	Leader in Technology Innovation	495	$ .452	$ 1.110	$ 1.562	• Mitigate risk in core NYISO functions • Build on 2012 investment and advance technology consolidation to reduce NYISO support costs
Windows Server Upgrade	Deployment	Excellence in Execution	188	$ .225	$ .070	$ .295	• Maintain product support • Uphold NYISO security posture

Finance Products

	Proposed Deliverable	Strategic Objective	Priority Score	Estimated Cost (in millions)			Benefits
				NYISO Labor	Capital/ Consultancy	Total	
2012 Project Continuation							
Credit Management System (CMS): Energy Transactions	Deployment	Leader in Market Design	575	$ .287	$ -	$ .287	• Better alignment of credit requirements to market risk • Support enhancements to transactions bidding and scheduling associated with Broader Regional Markets
Projects for Prioritization							
CMS: Enhanced MP Data Access	Functional Requirements	Excellence in Execution	337	$ .138	$ -	$ .138	• Increased transparency to MP credit , risk management and certification data • Enhanced Functionality
DSS: Enhanced MP Data Availability	Deployment	Excellence in Execution	390	$ .085	$ -	$ .085	• Increased transparency to invoice and billing data
Data Retention Analysis	Study Complete	Excellence in Execution	492	$ .102	$ -	$ .102	• Performance improvements • Potential cost savings
Expanded Functionality Billing Simulator	Deployment	Excellence in Execution	250	$ .179	$ -	$ .179	• Improved user interface to allow user to run multiple billing scenarios changing underlying data
ICAP Spot Market Credit Enhancements	Market Design Concept	Leader in Market Design	270	$ .018	$ -	$ .018	• Better alignment of credit requirements to market risk
Oracle Financials Upgrade	Functional Requirements	Excellence in Execution	387	$ .121	$ .400	$ .521	• Enhanced Financial processing tool to support on going market & banking improvements. • Improved supportability and performance
Performance Tracking System Replacement	Deployment	Leader in Technology Innovation	322	$ .390	$ -	$ .390	• Improved supportability and performance • Enhanced Functionality
Unbalanced Trading Hubs	Market Design Concept	Leader in Market Design	145	$ .826	$ -	$ .826	• Expansion of existing functionality

Operations & Reliability Products

	Proposed Deliverable	Strategic Objective	Priority Score	Estimated Cost (in millions)			Benefits
				NYISO Labor	Capital/ Consultancy	Total	
*Mandatory Projects**							
Energy Management System (EMS) Visualization	Deployment	Leader in Reliability	232	$ .360	$ .825	$ .360	• Improved situational awareness of grid and market conditions • Improved wide area situational awareness • Increased distribution of data to internal users
Phase I Metering Upgrade	Deployment	Leader in Reliability	413	$ .212	$ .600	$ .812	• Provide phase 1 data in the Krey Primary Control Center • Improved redundancy for phase 1 data • Improved phase 1 analysis tools
Control Room Migration	Deployment	Excellence in Execution	700	$ .152	$ .760	$ .912	• Timely completion of internal moves and start up
2012 Project Continuation							
HTP Controllable Tie Line	Deployment	Leader in Reliability	420	$ .100	$ -	$ .100	• Increased reliability
Projects for Prioritization							
Dispatcher Training System (DTS) Sustainability	Deployment	Leader in Reliability	568	$ .277	$ -	$ .277	• Improved quality of NYISO and TO operations staff • Reduction in downtime and rescheduling/overtime due to significant DTS unavailability • Continued compliance with NERC PER-005
Enhanced Scarcity Pricing	Deployment	Leader in Market Design	650	$ .299	$ .350	$ .649	• Deliver proper pricing signals to the market • Enhance optimization of the market and grid reliability during SCR/EDP events
LI PAR Optimization	Market Design	Leader in Reliability	480	$ .050	$ -	$ .050	• Improved understanding of the power system interface between NYC and Long Island from the economic market perspective • Propose market changes based on this increased understanding

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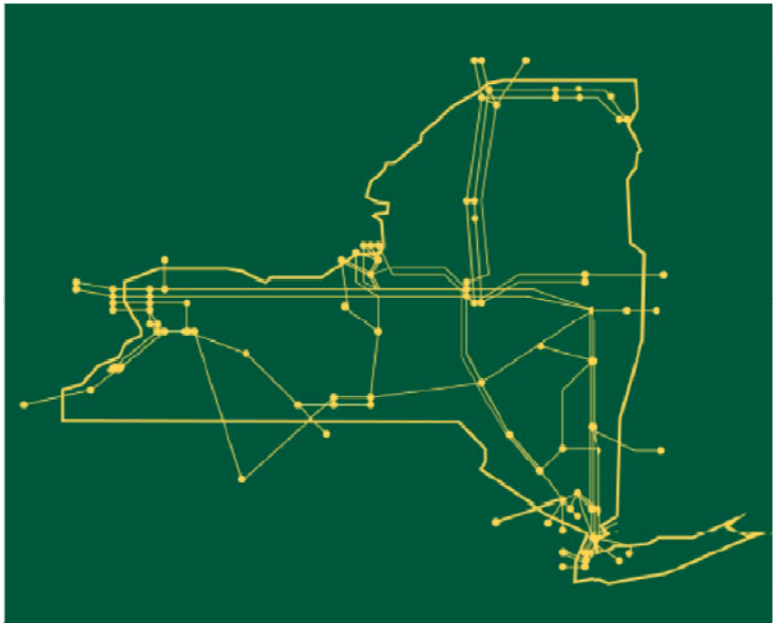
Operations & Reliability Products - Continued

	Proposed Deliverable	Strategic Objective	Priority Score	Estimated Cost (in millions)			Benefits
				NYISO Labor	Capital/ Consultancy	Total	
Projects for Prioritization							
MetrixIDR (Load Forecaster Upgrade)	Deployment	Leader in Reliability	542	$ .159	$ .100	$ .259	• Enhanced functionality • Allows Operators to focus on the forecast, not complexity of software
Operational Tools 2013	Deployment	Leader in Reliability	520	$ .297	$ .650	$ .947	• Elimination of risks associated with duplicate DMNC data • Improved analysis of SCUC solution
Ranger Enhancements	Deployment	Leader in Reliability	480	$ .147	$ .165	$ .312	• Improved identification and processing of renewable energy sources • Improved alarm processing • Inclusion of all 100kv and above transmission lines
Ranger Optimization & Performance Enhancements	Development Complete	Leader in Reliability	865	$ .256	$ 3.710	$ 3.966	• Improved commitment analysis performance • Improved economic dispatch results • Enable support of disaggregated virtual bidding
Ranger Software Upgrade	Development Complete	Leader in Reliability	672	$ .273	$	$ .273	• Increased supportability • Increased Ranger platform stability • Avoidance of sunset platforms
Ranger Workstation Upgrade	Deployment	Leader in Reliability	528	$ .101	$ .300	$ .401	• Required for better integration with the DTS • Improved visualization capability for the Operators • Technology refresh for the consoles
Reference Level Software (RLS) Enhancements	Deployment	Excellence in Execution	600	$ .147	$ .165	$ .312	• Increased transparency to MP reference levels • Enhanced Functionality allowing MMA to more accurately identify reference issues
ROS DAM BPCG Mitigation Automation	Deployment	Excellence in Execution	410	$ .066	$ -	$ .066	• Improved mitigation/penalty screening accuracy and integrity • Elimination of risks associated with manual screening techniques

Planning and TCC Products

	Proposed Deliverable	Strategic Objective	Priority Score	Estimated Cost (in millions)			Benefits
				NYISO Labor	Capital/ Consultancy	Total	
Projects for Prioritization							
High Performance Computing Redundancy	Deployment	Leader in Technology Innovation	388	$ .069	$ .100	$ .169	• Increased performance to conduct large, data intensive studies for CARIS, IRM, and RNA processes • Reduced risk of system failure
Multi-Duration Centralized TCC Auction Phase 2	Functional Requirements	Leader in Market Design	438	$ .302	$ -	$ .302	• Supports of Balance-of-Period Auctions • Automation of TO revenue allocation • Improved efficiency through automation
Siemens PTI Model-on-Demand Phase 2	Deployment	Robust Planning Processes	473	$ .084	$ .072	$ .156	• Support intent of FERC Order 890 • Reduced risk of errors from manual entry required for modeling efforts • Interface for TOs to enter, review and submit data for NYISO developed models
TCC Auction Engine Upgrade	Software Ready	Leader in Market Design	468	$ .060	$ .075	$ .135	• Maintain product support • Allows increased bids per organization • Supports multi-duration auction format
TCC Auction VB6 Validation Tool Replacement Phase 1	Deployment	Excellence in Execution	288	$ .300	$ -	$ .300	• Maintain product support • More efficient market outcome validation process
TCC Three-month Bid Data Release Automation	Deployment	Excellence in Execution	298	$ .128	$ -	$ .128	• Reduced risk of errors from automation of manual process • Improved efficiency through automation

The New York Independent System Operator (NYISO) is a not-for-profit corporation responsible for operating the state's bulk electricity grid, administering New York's competitive wholesale electricity markets, conducting comprehensive long-term planning for the state's electric power system, and advancing the technological infrastructure of the electric system serving the Empire State.



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