NYISO
2003 Budget Review

Value Analysis of Information Technology Projects

09/30/2002

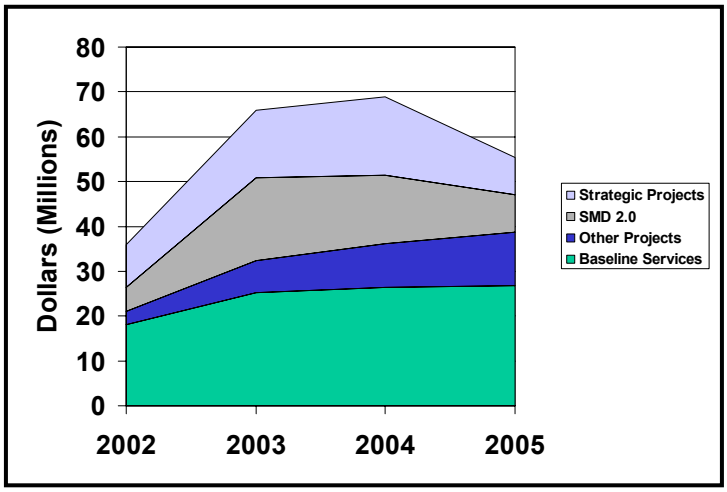
Today's Discussion

- **Summary of strategic IT projects driving 2003 budget increase.**
  - *Overview*
  - *Costs*
  - *Deliverables*
- **Review of benefits to be provided.**
  - *Costs avoided, where applicable*

Process Approach

- **Project Based Model**
  - *All costs are identified and allocated according to specific projects.*
- **Baseline Services**
  - *Core services required to keep existing systems maintained, markets functioning efficiently, and NYISO operations running smoothly.*
- **Strategic Projects.**
  - *Work efforts designed to substantially improve or expand NYISO markets, establish market leadership, or add new significant market capability.*

Budget Analysis



2004 & 2005 Figures Represent Estimates

Strategic Projects / Deliverables

- **SMD 2.0 Software Implementation**
  - *Real-time Scheduling (RTS) System*
  - *EMS-SCADA Replacement*
- **Open Scheduling System (OSS)**
- **Decision Support System (DSS)**
  - *Data Warehouse*
- **Enterprise Application Integration (EAI)**

Other Market Enhancement Projects

- **Day Ahead Demand Response Programs**
- **Scarcity Pricing**
- **Automated TCC Auction**
- **Automated UCAP Auction**
- **Station Service**
- **Controllable Line Pricing**
- **Other….**

SMD 2.0 Project Summary

- **Replacement of existing real-time scheduling system (SCD).**
- **Replacement of EMS and SCADA systems**
- **Implementation of FERC SMD compliant market systems.**

SMD 2.0 Project Assessment - Costs

- **Project costs include software, hardware and resources for the implementation of RTS, EMS, SCADA and Training/Testing Environment.**
- **Estimated annual costs:**

Year	2002*	2003	2004	2005	2006	Total
RTS	2.0	3.8	1.7	–	–	7.5
EMS/SCADA	1.5	3.5	1.0	–	–	6.0
Training Env.	1.5	2.5	1.0	–	–	5.0
Hardware**	–	3.0	6.0	6.0	3.0	18.0
Labor	0.5	5.7	5.7	2.2	–	14.1
Total ($M)	5.5	18.5	15.4	8.2	3.0	50.6

* Included in current revised budget ** Hardware costs represent financed values

- **ABB has agreed to tie implementation costs of SMD 2.0 with software performance to correlate proposed costs and benefits.**
  - *Available criteria for evaluation includes software reliability, fail over capabilities, delivery timeline, price convergence, price stability and/or price quality.*

2004 & 2005 Figures Represent Estimates

SMD 2.0 Benefits - Uplift Analysis

- **Uplift Impact**
  - *Uplift reductions resulting from:*
    - Price consistency between real-time scheduling and dispatch
    - Ancillary service scheduling
    - Reduced out-of-merit requests
  - *Categories of uplift impacted include:*
    - 81203/81208 Balancing NYISO BPCG – Internal Units
    - 81204/81209 Balancing NYISO BPCG – External Units
    - 81315/81317 DAM Contract Balancing
  - *Annual reduction in uplift of $16+M*

SMD 2.0 Assessment – Power Costs

- **"Economic and Reliability Assessment of a Northeast NERTO" calculated annual savings in wholesale power costs to NY of:**

	2005 ($M)	2010 ($M)
Seams Elimination/ Market Standardization	77	18
Eliminate Export Fees	166	94
Single Dispatch	34	17

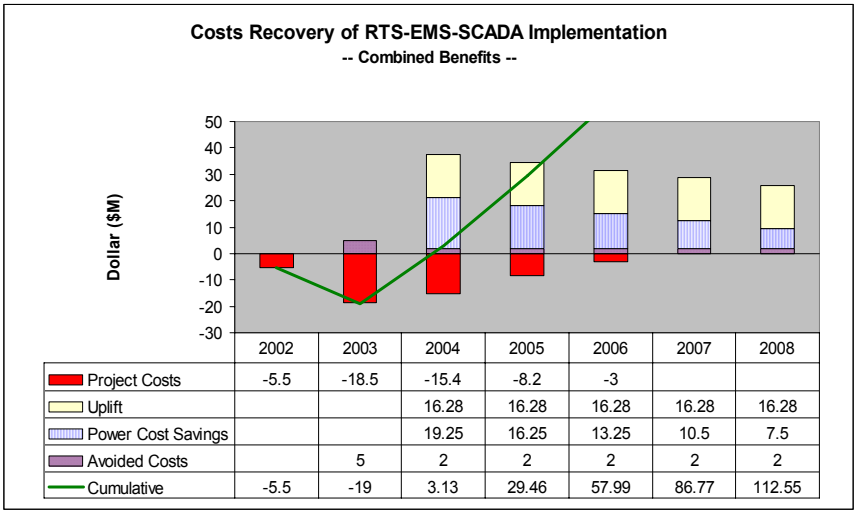
- **Presumed a linear reduction in benefits from 2005 to 2010, and benefits would be achieved beginning with the first year of SMD 2.0 operation (2004)**
- **SMD 2.0 produces a conservative 25% of "Seams Elimination/Market Standardization" benefits due to:**
  - *Enhanced transaction capacity*
  - *Reserve schedule and pricing*

	2004	2005	2006	2007	2008
Benefits ($M)	19.25	16.25	13.25	10.5	7.5

SMD 2.0 Assessment – Costs Avoided

- **Infrastructure Expansions**
  - *10,000 task hours and $5M necessary to enhance mainframe environment and software systems to support on-going expansions in generation facilities and monitoring requirements*
- **On-going software development efforts of $2M/yr on legacy platform**
- **Limited resources available to support existing infrastructure**
- **Extended development timelines**

SMD 2.0 Assessment – Return on Investment



	2002	2003	2004	2005	2006	2007	2008
Project Costs	-5.5	-18.5	-15.4	-8.2	-3		
Uplift			16.28	16.28	16.28	16.28	16.28
Power Cost Savings			19.25	16.25	13.25	10.5	7.5
Avoided Costs		5	2	2	2	2	2
Cumulative	-5.5	-19	3.13	29.46	57.99	86.77	112.55

2004 & 2005 Figures Represent Estimates

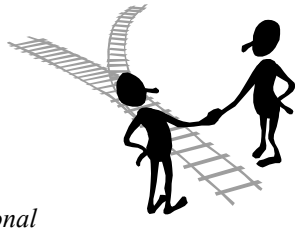
SMD 2.0 Assessment – Risks Avoided

- **Address software failure potentials**
  - *Market Failure:*
    - Typical Day: $575K Market commerce/hour
    - Peak Conditions: $12M Market commerce/hour
  - *Relieve NYISO infrastructure barrier to new market participation*
  - *$30M price tag small in comparison to $5,600M annual market volume (0.2% annual).*

SMD 2.0 – Benefits to New York

Market Features Incorporated	Market Efficiencies
▪Robust Ancillary Service Markets ▪Increased Control Area Interchange ▪Greater Security and Flexibility ▪Increased Capabilities for Demand Response	▪Ancillary Service market pricing and settlement ▪Improved in-day scheduling and dispatch ▪Long-term incentives for generation expansion and load responsiveness
Market Leadership	**Solution Quality**
▪Build upon strength of SCUC ▪Compliance with FERC SMD ▪Establish NYISO markets in an SMD leadership role	▪Affordable failover/redundancy capabilities ▪Improved data validation and transparency ▪Delivers software modification and enhancement flexibility

SEAMS Elimination



- **Enhanced Inter-Control Area Transaction Management**
  - *Extended protocols for common regional market interface to improve transaction coordination*
  - *Consistent scheduling timeframes*
  - *Coordinated transaction ramping of schedule changes*
  - *Improved ATC/TTC calculations and coordination*
  - *Increased transaction volume*
- **No new SEAMS created**
  - *Design implementation to be coordinated through existing Seams resolution agreements*

SMD 2.0 Project Overview

- **Proceed with an SMD 2.0 implementation with ABB.**
- **Project results in fast positive returns and more efficient / effective markets.**
- **Mitigate risks (and costs) by shortening exposure to existing deficiencies and problems.**
- **Action required regardless of market impacts or RTO:**
  - *Modeling and scheduling limitations*
  - *System supportability*
  - *Establish a technologically advanced marketplace*
- **SMD 2.0 (Day Ahead Market and Real Time market software) achieves compliances with SMD by the FERC directed deadline.**

OSS Project Summary

- **Deliver an open, scalable market integration technology that will provide a fundamental building block for the SMD 2.0 architecture**
- **Implement a communication medium based on standards and open systems**
- **Provide an industry leading set of tools for Market Participants and ISOs/RTOs to interact, trade and communicate within and across control area boundaries**

Possibly the first deliverable of SMD 2.0 architecture and continued evolution of the NYISO Online Presence

OSS Project Summary (Continued)

- **OSS will deliver the ability to:**
  - *Enter bids across ISO / RTO borders with a single data entry interface*
  - *Enable 15-minute transaction schedules required for SMD 2.0 implementation*
  - *Perform automated checkout of transactions across control area boundaries*
  - *Request transmission and ramp reservations*
  - *Manage market functions through a common interface*

OSS Project Assessment - Costs

- **Estimated annual costs:**

Year	2002*	2003	2004	2005	2006	Total
Support	–	0.3	0.5	0.5	0.5	1.8
Development	2.0	2.0	2.2	–	–	6.2
Hardware**	–	–	–	–	–	–
Labor	1.6	1.4	1.4	–	–	4.4
Total ($M)	3.6	3.7	4.1	0.5	0.5	12.4

* Included in current revised budget

** Hardware costs represent financed values

2004 & 2005 Figures Represent Estimates

OSS Benefits

- **Data consistency across ISOs / RTOs**
  - *More certainty that schedules will flow*
- **Reduced effort for data entry**
  - *Single point of entry*
  - *Enhanced user interface with more efficient tools*
- **Node-to-node model accommodates different market models, including business process, timing, and ramp rate**
- **More efficient inter-control area checkout processes**
- **Addresses critical Inter-Control Area transaction Seams issues with minimal impact on current market processes**

DSS Project Summary

- **Provide NYISO internal and external customers with timely and accurate information along with sophisticated analysis tools**
- **Implement a high performance, reliable central data repository independent of transactional market systems**
- **Target customized reporting capabilities to critical customer data requirements areas; Billing and Market Monitoring.**

Implement reliable data services and tools to compliment full-featured SMD 2.0 market suite

DSS Project Summary (Continued)

- **DSS will deliver the ability to:**
  - *Use business intelligence tools to perform custom analysis on market and operational data*
  - *Provide on-line data access to billing determinant data for complete customer bill reconciliation*
  - *Present core market data in functional format from new SMD 2.0 systems for market mitigation, operational performance measurement, and customer analysis*
  - *Consolidate total customer data requirements of new SMD 2.0 software*

DSS Project Assessment - Costs

- **Estimated annual costs:**

Year	2002*	2003	2004	2005	2006	Total
Support	–	0.3	1.0	1.0	0.5	2.8
Development	1.8	2.7	2.5	1.0	–	8.0
Hardware**	2.0	4.0	5.0	3.0	1.0	15.0
Labor	0.9	1.8	1.1	0.5	–	4.3
Total ($M)	4.7	8.8	9.6	5.5	1.5	30.1

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DSS Benefits

- **Consolidated, efficient vehicle for information delivery across the NYISO**
  - *More consistent analyses*
  - *Single source provides quicker access to strategic information*
  - *Enables more sophisticated analyses (MMU – Gaming)*
- **Improved access for all Market Participants**
  - *Lowers barrier to entry and levels playing field*
- **Market transparency**
  - *Increased awareness reduces burden on NYISO support staff*
- **Reduced reporting workload on transactional systems**
  - *Improves performance of market applications*

EAI Project Summary

- **Provide mechanism for open data exchange between NYISO operations and market functions**
- **Enable rapid development of new systems by delivering standards based data transfer mechanism**
- **Improve data accessibility and availability of market data to Market Participants and NYISO staff**
- **Decrease dependence on custom application interfaces**

Implement open messaging system that will be cornerstone of SMD 2.0 communication architecture

EAI Project Summary (Continued)

- **EAI will deliver the ability to:**
  - *Seamlessly integrate access for customers requiring customized portals to data warehouse and market systems*
  - *Enable smooth migration from legacy systems to SMD 2.0 functionality*
  - *Significantly reduce cost and risk associated with new system development*

EAI Project Assessment - Costs

- **Estimated annual costs:**

Year	2002*	2003	2004	2005	2006	Total
Support	0.4	0.5	1.3	1.0	0.5	3.7
Development	0.6	0.7	1.0	–	–	2.3
Hardware**	–	0.6	0.8	1.1	0.5	3.0
Labor	0.2	0.8	0.6	0.2	–	1.8
Total ($M)	1.2	2.6	3.7	2.3	1.0	10.8

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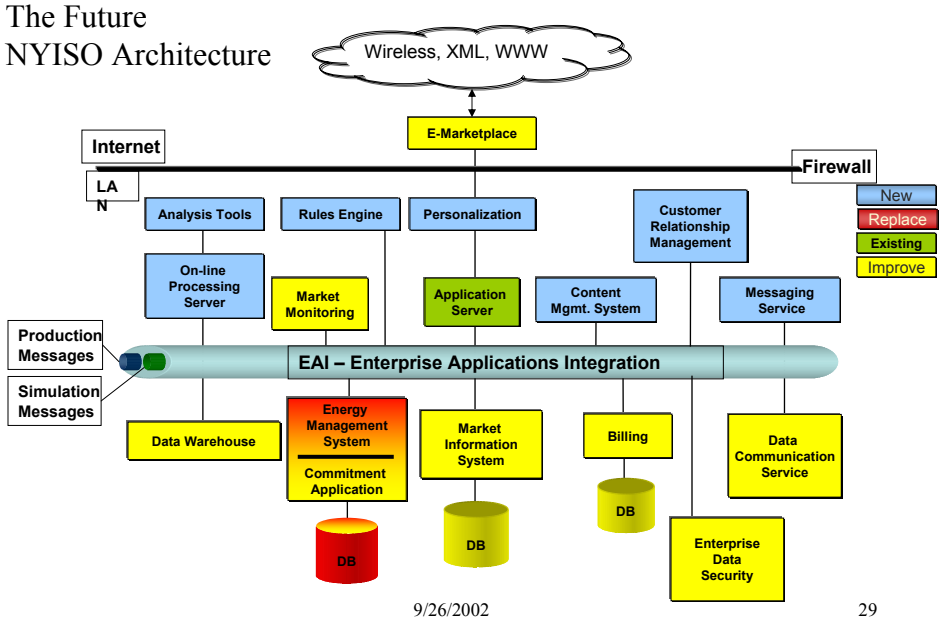
EAI Benefits

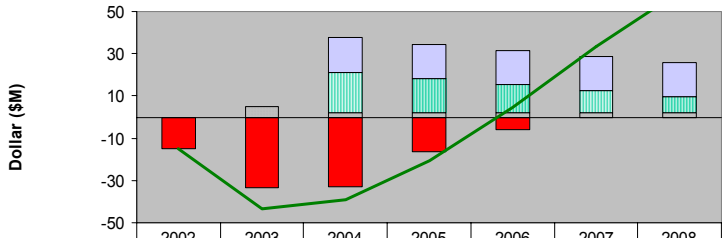
- **Implementation of open messaging architecture will improve accessibility of key market data and improve operational efficiency**
- **A robust integration suite will increase data reliability transfers between component systems**
- **Increased ease of data access will provide greater transparency to the Markets and applications**
- **Use of standardized interfaces will decrease development and maintenance costs of component systems.**

The Future
NYISO Architecture



SMD 2.0 Assessment – Return on Investment

Costs Recovery for Entire Strategic Project Suite Implementation
-- Combined Benefits --



	2002	2003	2004	2005	2006	2007	2008
Project Costs	-15	-33.6	-32.8	-16.5	-6		
Uplift			16.28	16.28	16.28	16.28	16.28
Power Cost Savings			19.25	16.25	13.25	10.5	7.5
Avoided Costs		5	2	2	2	2	2
Cumulative	-15	-43.6	-38.87	-20.84	4.69	33.47	59.25

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