

# Delivering the Nuclear Promise: Advancing Safety, Reliability And Economic Performance

***NUPIC Vendor Conference***  
***David Kimball - Cooper Nuclear Station***  
***June 21, 2017 ♦ New Orleans***

# Industry's Efficiency Program: Delivering the Nuclear Promise

- Sustain high levels of safety and reliability
- Identify opportunities to redesign plant processes, drive innovation to improve efficiency and effectiveness
- Gain greater value for nuclear energy in electricity policy



# Nuclear Energy's Value to America



SAVES CONSUMERS  
AN AVERAGE OF  
**6 PERCENT**  
ON ELECTRICITY BILLS



SUPPORTS  
**475,000**  
JOBS

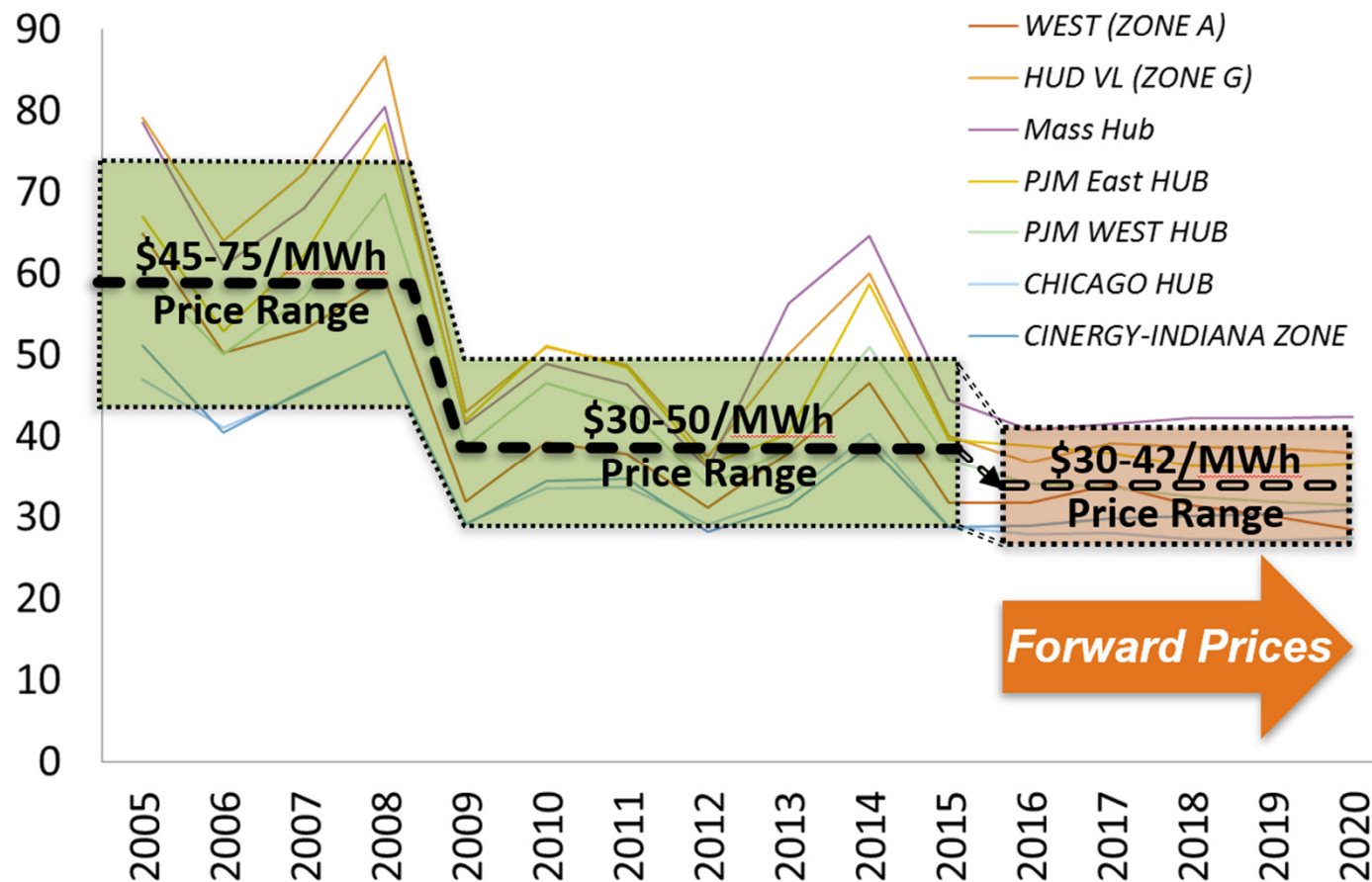


CONTRIBUTES  
**\$10 BILLION in FEDERAL**  
AND **\$2.2 BILLION in STATE**  
TAXES EACH YEAR



Source: *The Nuclear Industry's Contribution to the U.S. Economy*,  
The Brattle Group, July 2015

# Declining Wholesale Electricity Prices



# Major Industry Challenges

- Electricity demand is expected to remain flat or show marginal growth.
- Nuclear plant costs increased as electricity markets were deluged with natural gas at historically low prices.
- Solar and wind continue to expand, thanks to state, federal policy support.
- Flawed electricity markets fail to recognize and value nuclear energy's key attributes.
- Nuclear energy's average generating cost peaked at \$40 per megawatt-hour in 2012.

**Nuclear Plant Costs**

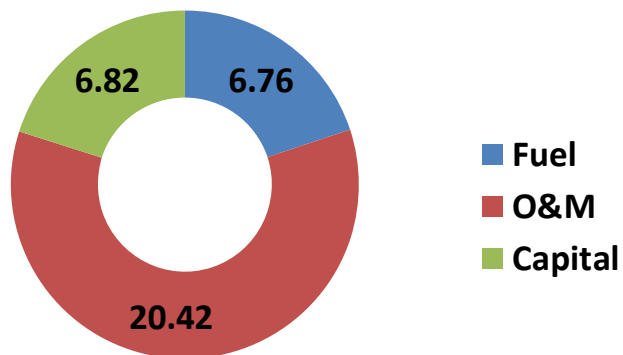
Year	Total Cost (\$/MWh)
2002	28.27
2005	29.80
2010	36.59
2011	39.08
<b>2012</b>	<b>39.75</b>
2013	36.91
2014	36.35
2015	35.50

# Snapshot of 2016 U.S. Nuclear Plant Costs

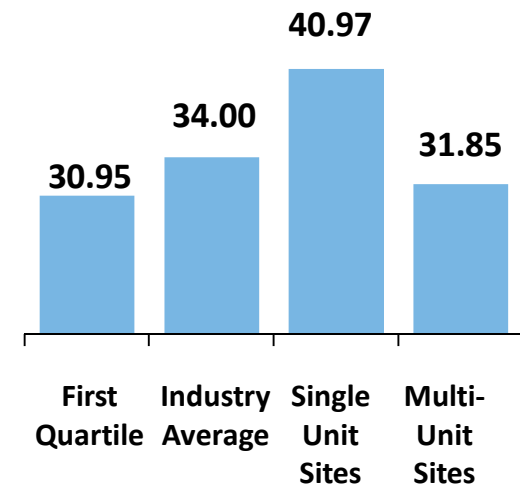
(\$ per MWh)

- Average generating costs have decreased from peak of \$40.25/MWh in 2012 to \$34.00/MWh in 2016.
- Average generating costs have decreased 6% from 2015.
- Capital spending down 15% from 2015, and 38% from 2012 peak.
- \$5.45 billion in 2016 capex.

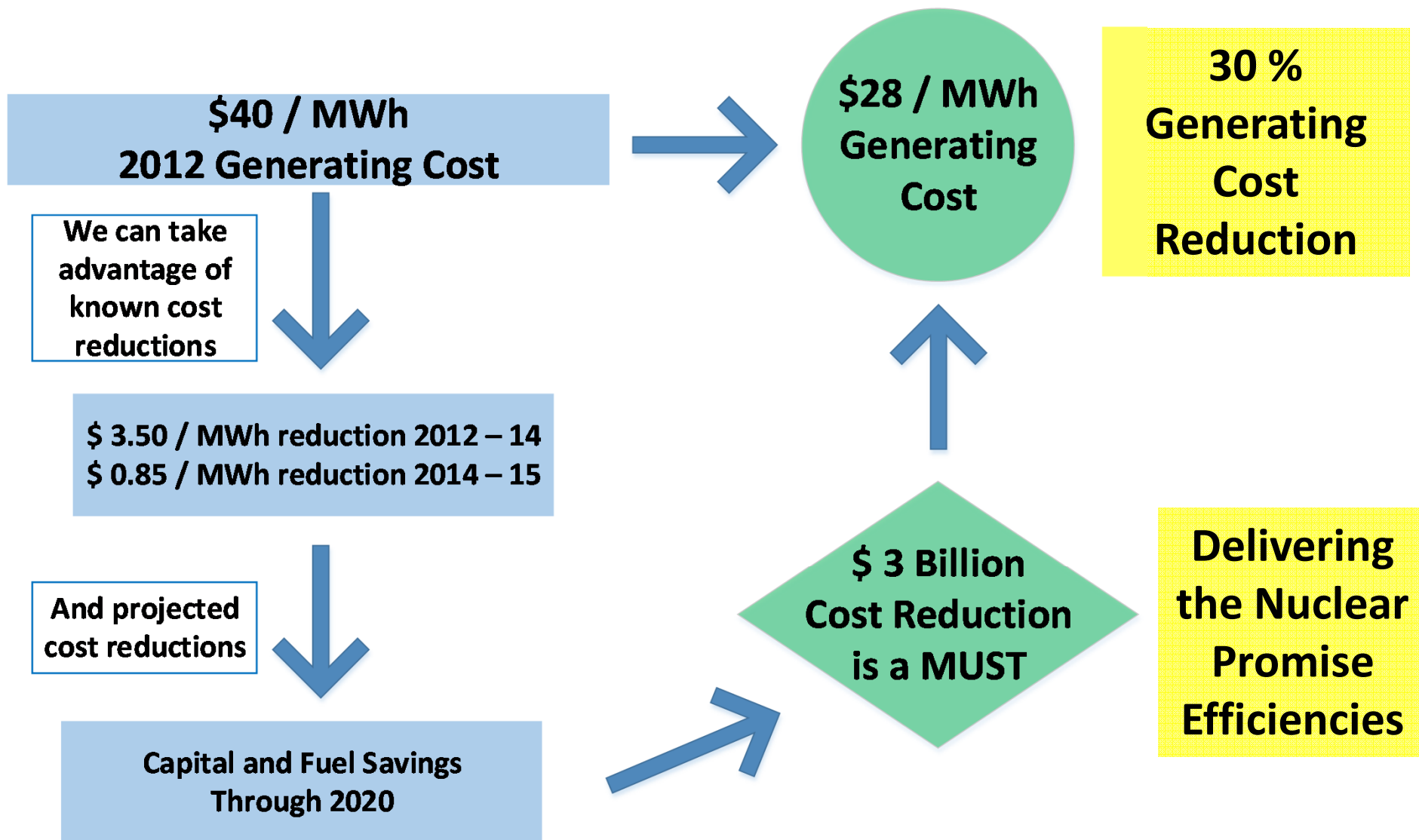
**2016 Generating Cost**



**2016 Average Generating Costs**



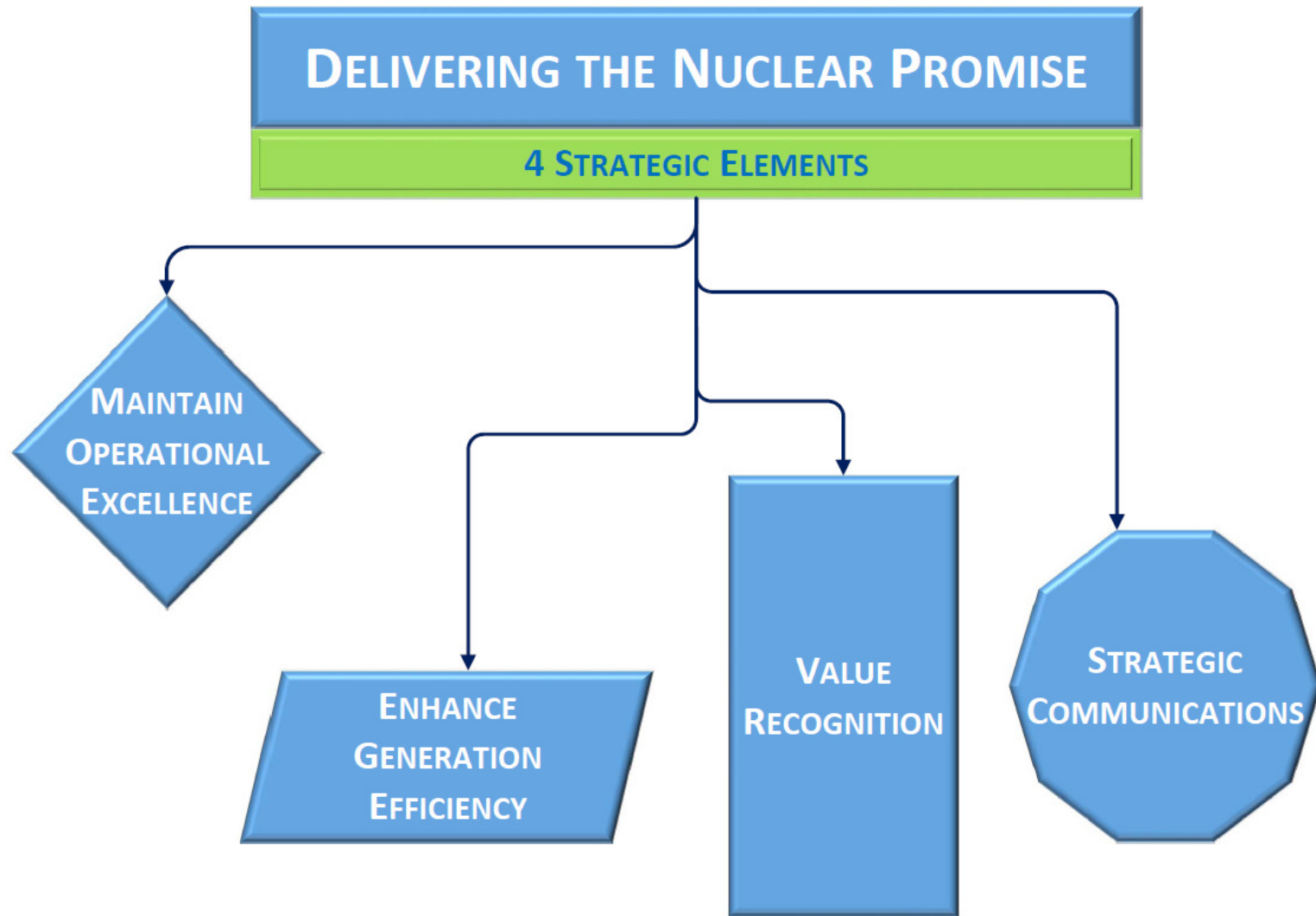
*Total generating cost = fuel + capital + operating.  
Source: Electric Utility Cost Group.*



# States Recognize Need for Action

- New York – NYPSC made zero-carbon nuclear plants eligible for credits under Clean Energy Standard
- Illinois – Passed law for zero-emission credits for at-risk nuclear
- Connecticut – Would allow nuclear to compete with other non-emitting sources for long-term contracts.
- Other states and regions considering action





# Operational Efficiency

- 49 Efficiency Bulletins providing \$881M enabled savings
- 2017 - High-value focus
  - Transforming Organization will drive significant improvements
  - Corrective action program phase 2
  - In-processing phase 2
  - Risk-informed improvements
  - Standard design process (issued)

# Saves Thousands of Jobs

- The ultimate goal of this initiative is to keep existing nuclear plants operating and save thousands of jobs.
- As the initiative proceeds, the industry is mindful that approximately 38 percent of our employees will be eligible to retire by 2020—roughly 40,000 workers.
  - As that wave of retirements approach, increased efficiency may ease some of the hiring challenges this creates, minimizing possible staffing reductions.

# DNP Created by the CNOs

- We have 12 teams, led by chief nuclear officers, looking for ways to become more efficient.
- This initiative is also leveraging the expertise of working groups from the industry and its organizations, such as the Electric Power Research Institute, the Institute of Nuclear Power Operations and the Nuclear Energy Institute.
  - In some areas, the initiative builds on earlier work identifying savings through efforts to reduce the cumulative impact of industry actions and duplicative layers of regulation.

# DNP Uses Innovation

- Employee participation is key to the success of this initiative and we are capitalizing on the strengths and innovative thinking of our workforce.
- As areas to improve efficiency are identified, industry teams determine the industry process, regulatory or business changes needed to make these efficiencies a reality.
- As always, the industry is steadfast in its resolve that we will never compromise safety at our nuclear plants as we pursue innovation and improved economic performance.

# What We've Accomplished So Far

- More than 49 efficiency bulletins being implemented; more on the way
  - Going forward, annual data from Electric Utility Cost Group will allow us to assess industrywide progress
- Emphasizing need for cultural change
  - Efficiency must take its place with hallmarks of safety, reliability
  - More autonomy for certain low-risk activities

## efficiency bulletin

June 3, 2016

Efficiency Bulletin: 16-14

### Training Cumulative Impact Strategies (Part 2)

Reduce low-value administrative burdens to produce efficiency gains in training.

**Addressees:** Chief nuclear officers, NEI APCs and INPO APCs

**Issue:** TRN-3.0, Cumulative Impact Strategies (Part 2)

#### Background

- This bulletin addresses the following cumulative impact items: TQ-2, Lesson Plan Detail; TQ-3, Management Observations of Training; and TQ-8, Training Committees from the INPO report "Training Cumulative Impact Report," dated January 2016. These three items were evaluated by fleet/alliance training directors and guidance has been provided (attached) for consistent industry implementation.

#### Summary of Efficiency Opportunity

- Desired end-state—Streamline training administrative activities to reduce distractions from training, reduce the time and resources required to conduct observations of training, focus on the quality rather than the quantity of observations, and reduce the time required for line and training participation in training committee activities.
- Value proposition (vision of excellence)—Improve the quality and efficiency of training by eliminating low-value administrative burdens accumulated from years of incremental internal and external responses to individual training-related performance issues. Shift the focus of observations to quality vs. quantity and remove the self-imposed quotas for completing observations. Lastly, restructure, simplify and focus training committees by reducing the quorum requirements, simplifying the agendas and reducing the frequency of required meetings.

Color Code: Blue  
Due: September 2016



NUCLEAR ENERGY INSTITUTE

The Nuclear Energy Institute is the nuclear energy industry's policy organization.

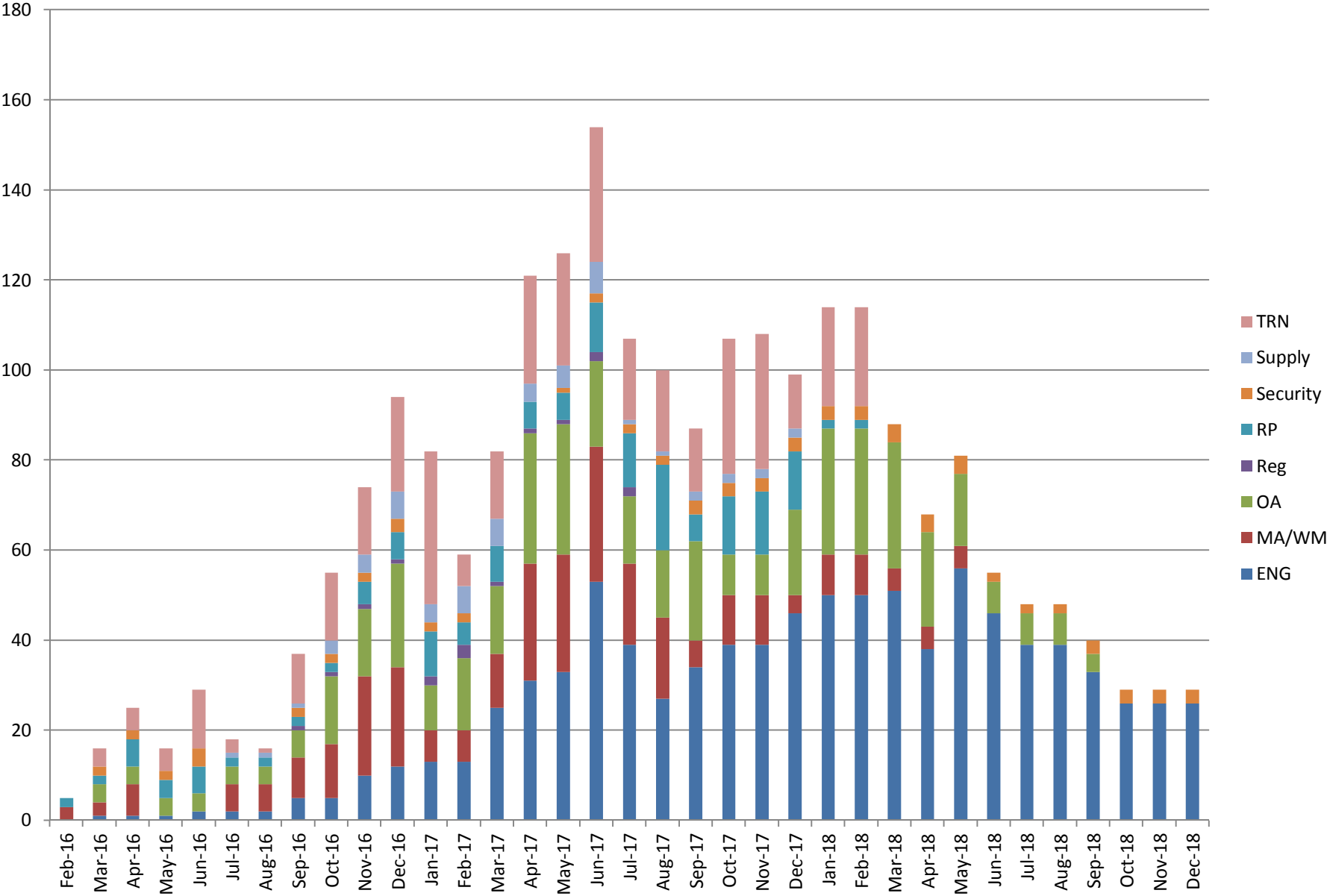
This bulletin and additional information about nuclear energy are available at [nei.org](http://nei.org).

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Efficiency Bulletins Value vs Resource Impact			
Value	High (> \$50M)	EB 16-5 NLO/MA and Technical Continuing Training (Transform enabler) EB 16-26a Standard Nuclear Access Processing and Requirements EB 16-26b Standard In-Processing Training EB 16-26c Implement Common NANTel Rad Worker Training EB 17-3a Value Based Maintenance (Transform enabler) EB 17-3b Embracing Cultural Shift for Value Based Maintenance (enabler for EB 17-3a) EB 17-6 Implement Standard Design Change Process	EB 16-30 Material Cost Reduction While Maintaining Quality EB 16-33 System Health Reporting Efficiencies (Transform enabler)
	Medium (> \$17M)	EB 16-10 Reducing Cumulative Impact from CAP (enabler for CAP-002) EB 16-15a Work Screening Process (Transform enabler) EB 16-18 NLO/MA and Technical Initial Training (Transform enabler) EB 16-22 Implement Effective/Efficient T-Week Process (Transform enabler) EB 16-27a Consolidation of Oversight Meetings EB 16-27b Optimized Corp. Oversight and Assessment EB 17-2 Self-Protection for Radiological Work Activities (Transform enabler)	EB 16-2 Implement Graded Approach to Walkdowns EB 16-23 Streamlined Use of Offsite Review Committee EB 16-27c Graded Approach for Executive Engagement EB 16-1 Eliminate Admin Changes to PM Work Orders (Transform enabler) EB 16-9 Security Shift Brief and Turnover EB 16-12 Graded Approach to Long-Term Dose Reduction Plan EB 16-15b Utilizing Minor Maintenance (Transform enabler) EB 16-15c FIN Team Efficiency (Transform enabler) EB 16-20 Security Equipment Assessment EB 16-21 Protective Strategy Modifications EB 16-29 Strategic Sourcing
	Low (< \$17M)	EB 16-25 Critical Component Reduction (enabler for EB 17-3a) EB 16-31 Pre-Approval Criteria for Work Execution (Transform enabler) EB 17-5 Simplified and Enhanced Management Observation Techniques	EB 16-13 Perform Self-Briefs for Low Radiological Risk Activities (Transform enabler) EB 16-16 High-Cost NonCrit Preventive Maintenance Reduction (enabler for EB 16-25) EB 16-3 Align PCE Reponse to Industry Guidance EB 16-4 Source Checking Personnel and Tool Contamination Monitors EB 16-6 Implement Standardized Search and Seal Process EB 16-7 Training Task Reviews EB 16-8 Eliminate Formal Margin Management Programs EB 16-11 Training Cumulative Impact Strategies EB 16-14 Training Cumulative Impact Strategies (Part 2) EB 16-17 Optimizing FLEX Equipment PM Strategies EB 16-19 Contract Forensics EB 16-24 Streamline Regulatory Organizations EB 16-28a Minimize NUPEC Vendor Audit Frequencies EB 16-28b Common Finding-Deficiency Definitions in Vendor Audits EB 16-32 ED Issuance for Visitors Requesting RCA Access EB 16-34 Streamline Program Health Reporting (Transform enabler) EB 17-1 Portable Supplemental RP Tech Training and Qualification EB 17-4 First-Line Supervisor Training and Development
		High	Medium
		Resource Impact	
		Low	

DNP Cumulative Impact for Issued and Scheduled EB





## DNP, Making Nuclear More Efficient: Videos

- [Delivering the Nuclear Promise Training Team Update with Randy Edington –](#)
- [YouTube.mhtDelivering the Nuclear Promise With Entergy's Brandi Crass - YouTube.mht](#)

# DNP Initiative-

## A Positive Impact

- Operations are more economically efficient
- Safety of U.S. nuclear energy plants remains very high
- Reliability of generation has increased
- Electricity markets are beginning to recognize the value of nuclear electricity generation

Nuclear Promise Performance (YTD)		
Efficiency Bulletins Issued	49	
Efficiency Bulletins Completed to date	22	
RED Efficiency Bulletins Completed	0/7	
Oldest issued Bulletin Still open	16-01 Green	2/1/2016 PSO
Latest issued Bulletin	17-06 RED	3/6/17 DED

NEI Overall Savings Estimate \$\$\$	11,944,022	
CNS Implemented \$\$ Estimate	4,888,088	
CNS Actual Cost Savings \$\$	320,900	
Estimated #FTE's to be Saved	41.56	
CNS Estimated FTE's reduced	21.33	
CNS Actual FTE's reduced	0.75	

# NUPIC Related EB's

- **Minimize NUPIC Vendor Audit Frequencies (EB 16-28a)**
- **Establish Common Finding/Deficiency Definitions Used During Vendor Audits (EB 16-28b)**

# Procurement Related EB's

- **Optimize Strategic Sourcing to Deliver Savings (EB 16-29)**
- **Material Cost Reduction While Maintaining Quality (EB 16-30)**

# NUPIC Related EB's

## **Minimize NUPIC Vendor Audit Frequencies (EB 16-28a)**

- This efficiency bulletin will utilize the regulatory allowance to audit suppliers at a frequency of 36 months.
- Additionally, flexibility will be achieved by the adoption of a safety evaluation report that allows a grace period of up to 25 percent.
- Aligning vendor audit periodicities with current regulatory requirements will reduce the cost associated with maintaining vendors on the Approved Suppliers List.
- Target implementation date: December 2017.

## **Establish Common Finding/Deficiency Definitions Used During Vendor Audits (EB 16-28b)**

- This efficiency bulletin will implement a uniform approach for identification, follow-up and closure of performance issues found during audits of supplier facilities.
- Currently, the NUPIC audit process does not contain a standardized definition of a finding and deficiency. The lack of specific NUPIC guidance has allowed for differences in implementation between member utilities, resulting in unproductive conflict and delays.
- Application of a consistent, graded approach will reduce the resources for audit activities and allow them to be used more effectively by the nuclear operating utility.
- Target implementation date: June 2017.

# Procurement Related EB's

## **Optimize Strategic Sourcing to Deliver Savings (EB 16-29)**

- Organization and process inefficiencies in the procurement supply chain result in significant hidden costs.
- The approach outlined in this bulletin will improve efficiency and help reduce costs by reorganizing, standardizing and prioritizing sourcing for nuclear power plants' parts and systems.
- Once this has been implemented, plant licensees will have a centralized, appropriately staffed strategic sourcing group to contract with suppliers. The resulting partnerships will deliver improved savings.
- Target implementation date: Utility discretion; consistent with business environment.

## **Material Cost Reduction While Maintaining Quality (EB 16-30)**

- Implementing this efficiency bulletin will create a centralized procurement engineering services organization that will reduce duplicative work and standardize procurement policies and procedures.
- This will help reduce the cost of parts, shorten procurement lead times and enhance in-house expertise.
- Target implementation date: Utility discretion; consistent with business environment.

# What Can You do to Help Us?

## Product Improvements

- Improve Quality of Products
  - Infant Mortality
  - Your Role in Internal Oversight
- Corrective Action Process Needs to be Robust
  - Help us with Basis for “Leap of Faith”
- Reduce Costs wherever Possible (we are targeting 30%)
  - Collaborative buying opportunities to allow for less setup costs.
- Better Collaboration Towards Supplier Auditing
- Improved Communications
  - Product Changes
  - Org Changes
  - QA Program Changes
- Industry Participation
  - Share Lessons Learned
  - Openness in Our Audits
  - Clarity in Industry OE