



CM&S: Supply Chain Sustainability in Practice

LEVERAGING YOUR SUPPLY CHAIN: Chemical Management

Verne Shortell
October 12, 2010

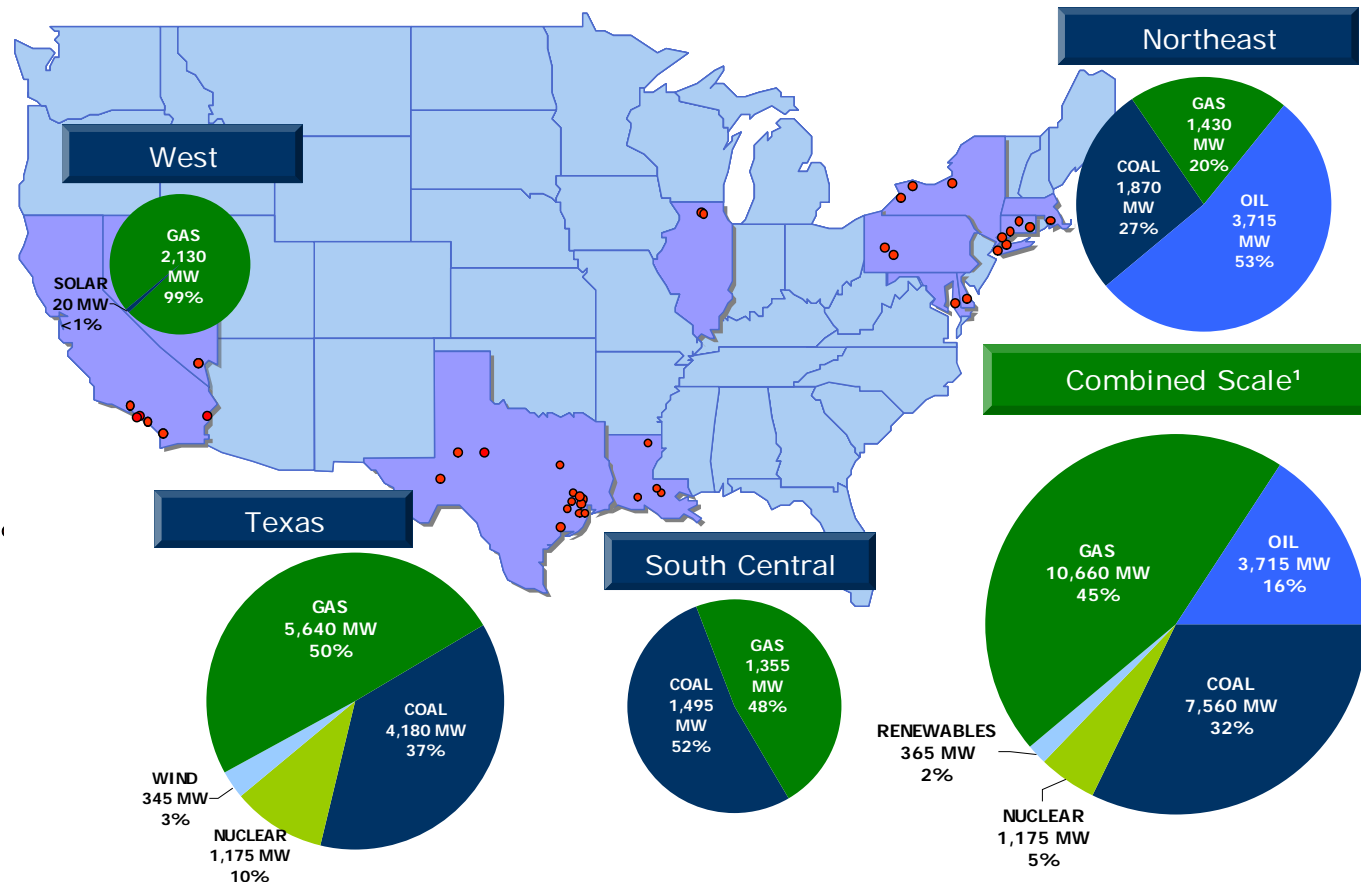


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This Presentation contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934. Forward-looking statements are subject to certain risks, uncertainties and assumptions and typically can be identified by the use of words such as “expect,” “estimate,” “should,” “anticipate,” “forecast,” “plan,” “guidance,” “believe,” “will” and similar terms. Such forward-looking statements include information relating to no and low carbon development projects. Although NRG believes that these expectations are reasonable, it can give no assurance that these expectations will prove to have been correct, and actual results may vary materially. Factors that could cause actual results to differ materially from those contemplated above include, among others, general economic conditions, hazards customary in the power industry, weather conditions, competition in wholesale power markets, the volatility of energy and fuel prices, failure of customers to perform under contracts, changes in the wholesale power markets, changes in government regulation of markets and of environmental emissions, the condition of capital markets generally, adverse results in current and future litigation, failure to identify or successfully implement acquisitions and repowerings, and the inability to implement value enhancing improvements to plant operations and companywide processes.

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NRG: Portfolio with Scale and Diversity



71 million megawatt hours of electricity and 59 million metric tons of CO₂e in 2009

¹ Includes 115 MW as part of NRG's Thermal assets. For combined scale, approximately 2.095 MW is dual-fuel capable. Reflects only domestic generation capacity as of December 31, 2009

MW data as of December 31, 2009

Asset scale, diversity of fuel and location provide value creation opportunities

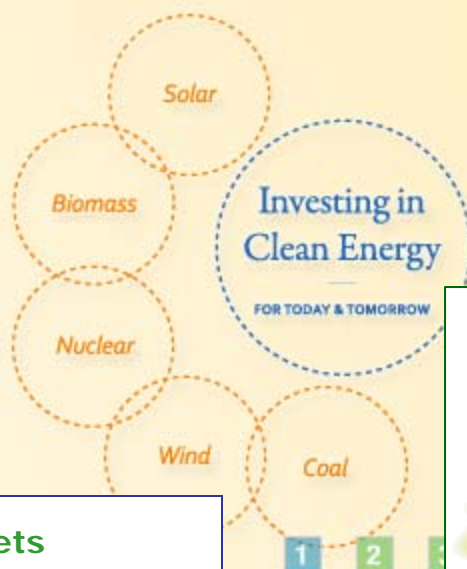
NRG: Clean Energy of the Future



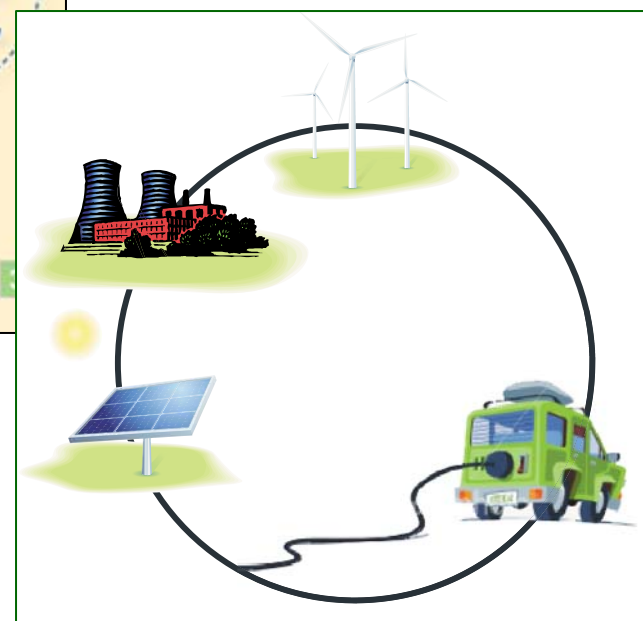
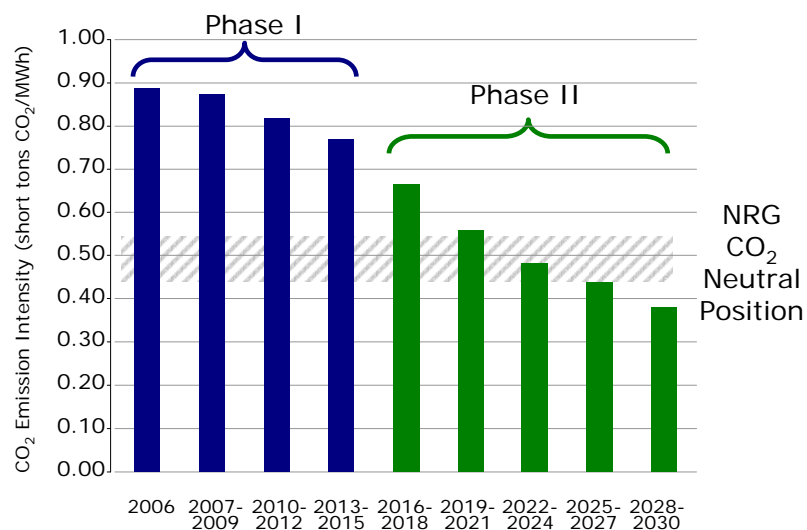
CLEAN NRG

NRG is contributing to the fight against climate change by investing in promising clean energy technologies, such as new nuclear, solar, wind and biomass.


View our brochure on our clean energy investments to find out more.



NRG CO₂ Intensity Targets (Repowering NRG and econrg Phase I & II)



From compliance to carbon and everything in between



Through **econrg**, NRG Energy seeks ways to meet the challenges of climate change, clean air and the protection of our natural resources.

Reducing our Footprint at Home & Work



**Plant
Performance**



**Home &
Work Energy
Use**



Lighting



**What Do
You Drive?**



**Reduce,
Reuse,
Recycle**



Partners

Supply Chain Sustainability: Where to begin?



- Benchmarking
- Ask them- 20 top suppliers excluding fuel
 - WHAT DO YOU DO FOR SUSTIANABILITY?
 - ANY SUCCESSES?
 - WHAT COULD WE DO BETTER?

- Results

No Reply

Hire me to show you the way

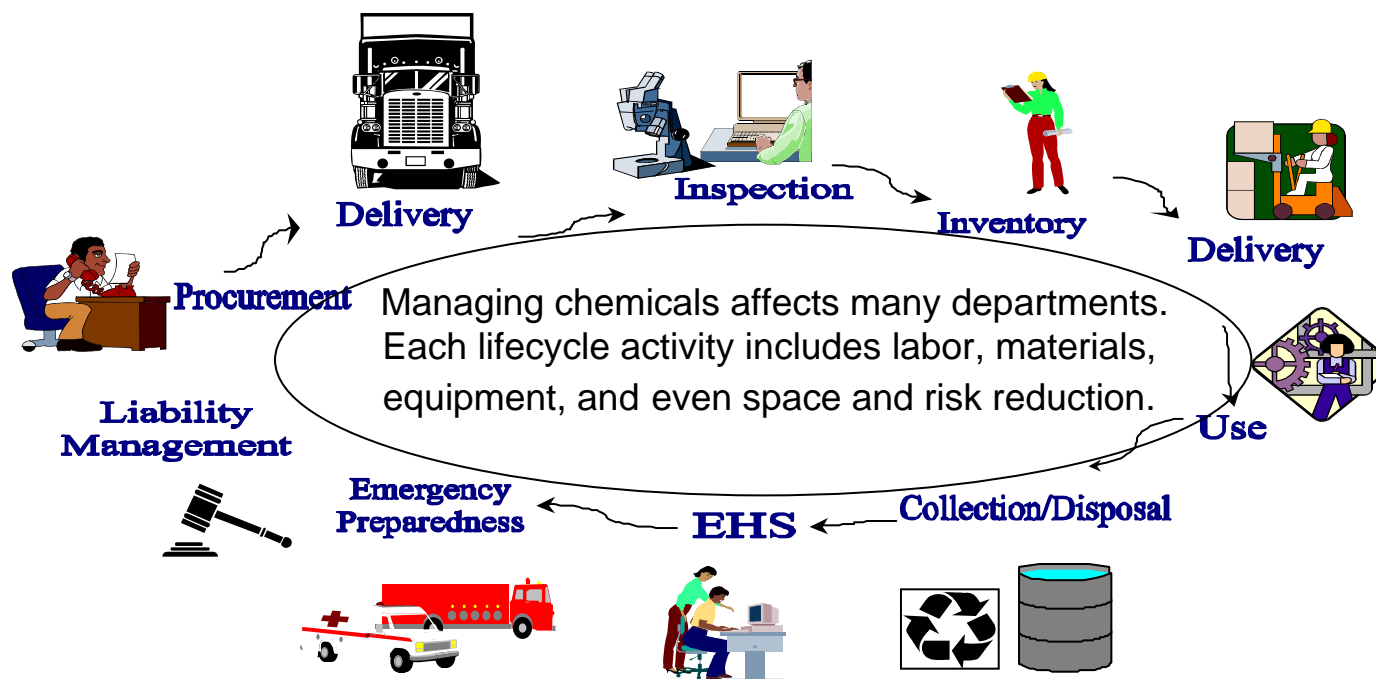
**Good
Ideas**

**Great
Ideas**

- Implement great ideas



Lifecycle Chemical Management



Sourcing and Procurement

- Supplier selection and management
- Alternate supplier contingency
- Purchase transaction
- Order tracking

Process Analysis & Optimization

- Usage tracking
- Chemical use efficiency monitoring
- Process monitoring
- Process Efficiency Improvement (PEI) Analysis and Recommendation



21 NRG
facilities
since May
2008

EHS Compliance Automation Assistance

- Chemical Gatekeeping
- New Chemical Additions
- Approval Management
- Online MSDS Management
- Storage and Handling guidance
- Speciated usage
- Formatted EHS Data Reports

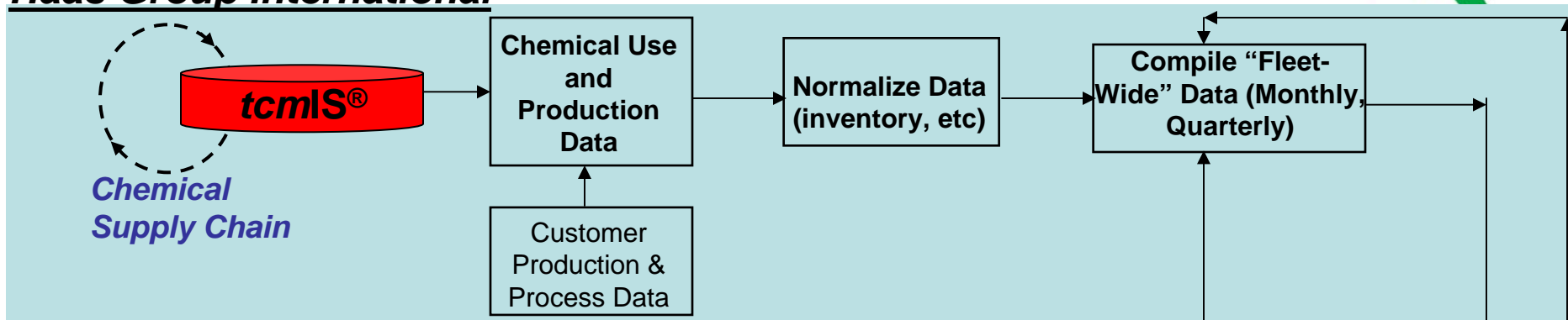
Business Process Streamlining

- Consolidated invoicing
- Online Financial Cost Tracking
- Customized Ad-Hoc Reporting

Chemical Efficiency Tracking and PEI Process

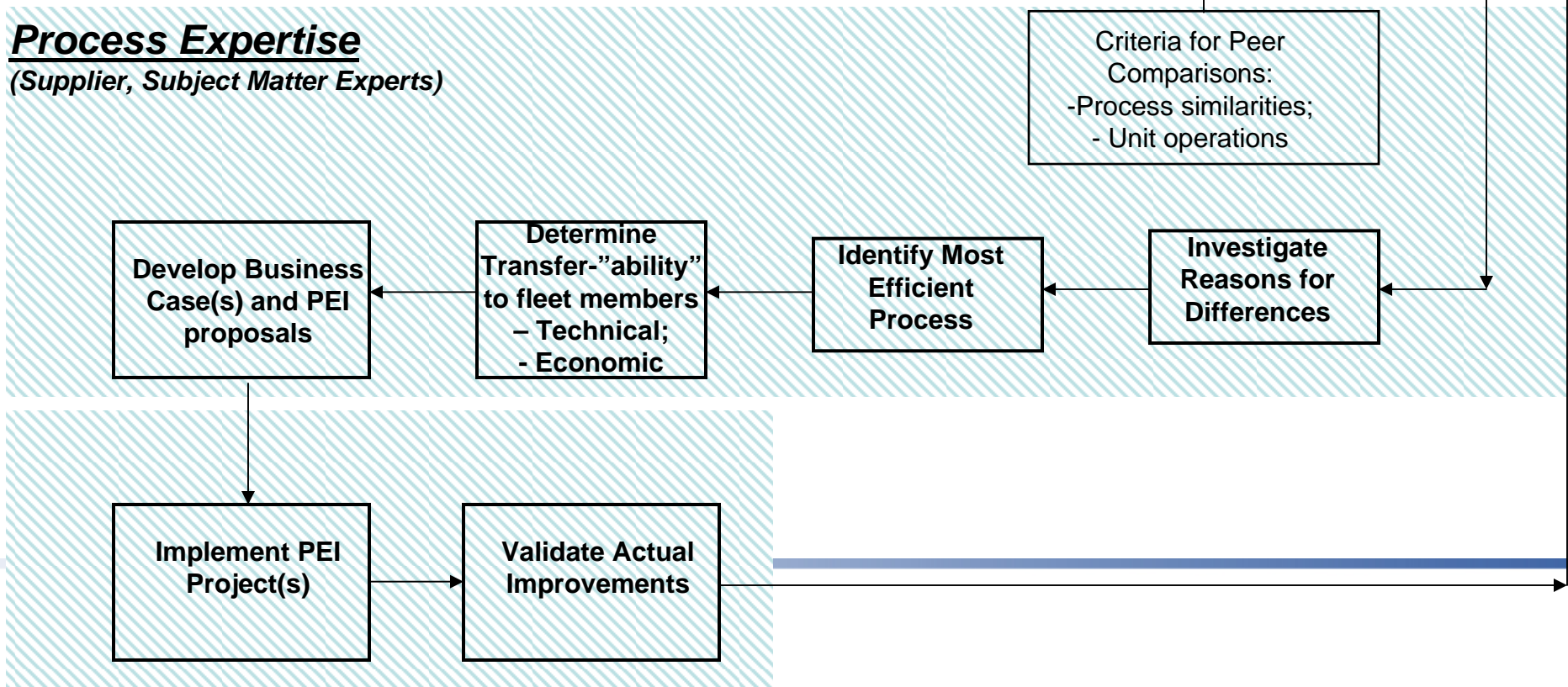


Haas Group International



Process Expertise

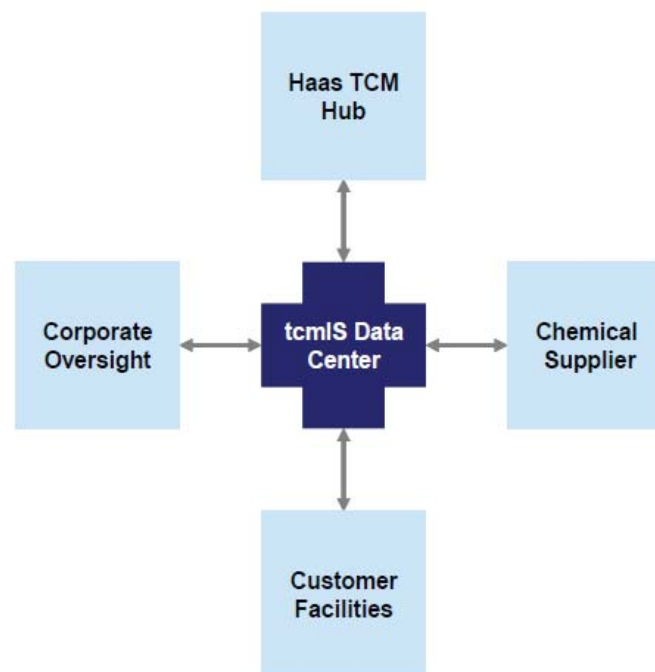
(Supplier, Subject Matter Experts)





Helping Monitor NRG's Environmental Footprint

tcmlS®

- Enterprise chemical supply chain automation platform
- Internet based
- Online access and visibility to critical supply chain data (order status, inventory, etc.)
- Online Specification and MSDS
- Chemical constituent recordkeeping and reporting (SARA and TRI)
- Cost tracking



- Performance Goal: Efficient asset performance while reducing NRG's chemical environmental footprint
 - **Save \$, Reduce**  , Improve Quality of Life for Employees and Neighbors 
- tcmlS[®] platform enables:
 - Chemical Approval Chemical gatekeeping tools
 - Track and report chemical usage and chemical speciation
 - Chemical efficiency reports, to track chemical usage and cost per unit of production. Assist in identifying opportunities to share best practices throughout the fleet.
 - Ability to reduce shipments
 - Consolidated invoicing
 - Budget reports



tcmIS® Reporting Features



Application Help

Chemical Orders Inventory Cat Add Waste Pickup Mgmt Shipping Reports Users Admin Stop Print Set

Formatted Usage

Formatted VOC Usage

Formatted MSDS Revision

Ad Hoc Usage

Ad Hoc Material Matrix

Chemicals to report

List SARA313 - SARA 313 View List

Singl Pb Inorganic - Inorganic Lead Compounds

All Pima TOM - Pima Co. Toxic Organic Mgmt

Progestins - Progestins

RCRA Acute Prod - RCRA Acutely Hazardous Products (40 CFR 261)

RCRA Tox - EPA RCRA Toxicity Characteristic Contaminants (40 CFR 261)

RCRA Tox Prod - RCRA Toxic Products (40 CFR 261)

REACH SVHC Cand - REACH Candidate List of Substances

Report Param

Facility: SARA313 - SARA 313

Work Area: All Work Areas

Group By: Facility Work Area CAS #/SARA Group

Order By: Part Number

Generate Report

1 / 3 80% Find

tcmIS Total Chemical Management "Relieving Chemical Pain"

SARA 313 Usage April 2008 through March 2009

Facility: Louisiana Work Area: All

Facility Louisiana

Work Area Boilers

Cas #/SARA Group	Trade Name	Work Area	Delivery Point	Units Used	lbs. per Unit	lbs. Used	% Wt. of Constituent	lbs. Reportable
1336-21-6	Ammonium hydroxide ((NH4)(OH))							
Part Number	Trade Name	Work Area	Delivery Point	Units Used	lbs. per Unit	lbs. Used	% Wt. of Constituent	lbs. Reportable
Y210500.91	Aqua-Cat Aqua Ammonia	Boilers	Chemical Receiving	8,020	1.0000	8,020.0000	29.4000	2,357.8799
Usage fc1336-21-6						2,357.879883 lbs. reportab		
7664-41-7	Ammonia							
Part Number	Trade Name	Work Area	Delivery Point	Units Used	lbs. per Unit	lbs. Used	% Wt. of Constituent	lbs. Reportable
5711.15	Nalco 5711	Boilers	Chemical Receiving	2	434.9607	869.9213	20.0000	173.9843
Usage fc7664-41-7						173.984268 lbs. reportab		
Usage fcBoilers						2,531.86 lbs. reportab		
67-56-1	Methanol							
Part Number	Trade Name	Work Area	Delivery Point	Units Used	lbs. per Unit	lbs. Used	% Wt. of Constituent	lbs. Reportable
30T104.91	3D Trasar 30T104	Cooling Towers	Cooling Towers	20,060	1.0000	20,060.0000	0.0000	0.0000

Real-time environmental reports to measure NRG's environmental footprint across the enterprise, gives the plant improved visibility to their chemical usage, and allows the user to create pre-formatted or customized reports by plant, work area, and asset

Online MSDS Management



MSDS

Revision Date

17/OCT/2005

MSDS

Composition

Properties

Lists

NFPA

HMIS

World Headquarters

Hach Company

P.O.Box 389

Loveland, CO USA 80539

(970) 669-3050

MSDS No: M01398

MSDS

Revision Date

17/OCT/2005

MSDS

Composition

Properties

Lists

NFPA

HMIS

Product Name: StablCal® Standard, 20 NTU

Catalog Number: 2660149

Hach Company

P.O.Box 389

Loveland, CO USA 80539

(970) 669-3050

MSDS Number: M01398

Chemical Name: Not applicable

CAS No.: Not applicable

Chemical Formula: Not applicable

Chemical Family: Not applicable

Hazard: May cause irritation. May cause allergic reaction.

Date of MSDS Preparation:

Day: 17

Month: 10

Year: 2005

CAS No	Name	Lower %	Upper %	Average*
7732-18-5	Demineralized Water	90	100	95
100-97-0	Hexamethylenetetramine	1	10	5.5
TS00241	Formazin Polymer	0	1	1

* The average is calculated according to the following EPA guidance.

The following guidelines were observed in estimating concentrations of toxic chemicals in mixtures when only limited information is available: If you know the lower and upper bound concentrations of a toxic chemical in a mixture, use the midpoint of these two concentrations for threshold determinations. If you know only the lower bound concentration, you should subtract out the percentages of any other known components to determine a reasonable upper bound concentration, and then determine a midpoint. If you have no information other than the lower bound concentration, calculate a midpoint assuming an upper bound concentration of 100 percent. If you only know the upper bound concentration, you must use it for threshold determinations. In cases where you only have a concentration range available, you should use the midpoint of the range extremes. 16 Toxic Release Inventory Reporting Forms and Instructions

Maintains an online MSDS database of all chemicals NRG orders through *tcmls®*, and archives previous versions of the MSDS files according to OSHA requirements. Chemical constituent data is also provided

Online Data Management-Chemical Specs



Licensed to NRG Energy Inc.

Application Help

Chemical Orders Inventory Cat Add Reports Users Stop Print Set

Approval Information / Search Criteria

Name: Wojcik, Eric
Facility: Oswego Harbor
Work Area: Select a Work Area
Catalog Type: Part Catalog
☒ Active for Facility ☐ Work Area Approved Only
☐ All Catalogs ☐ Active Only
Search

Shopping Cart Catalog Add

MSDS Information - Windows Internet Explorer

https://www.tcmis.com/tcmis/nrg/ViewMsd?act=spec&id=131130&spec=MuriaticAcid&id=NRG&facility=Oswego+Harbor&catpartno=Y212020.91

File Edit View Favorites Tools Help

MSDS Information

NRG

Muriatic Acid (20 deg. Baume)
Spec MuriaticAcid

Help

Spec Available Specs are linked
Please Select

MSDS
Revision Date
14/OCT/2005

MSDS
Composition
Properties
Lists

NFPA
Not listed

HMIS
Not listed

Bulk Chemical Specifications for Oswego Steam Station:

Muratic Acid

Strength	20° Be 19.8° Min to 20.8° Be Max
Color	30 Alpha Max
Appearance	Clear
Iron	0.0001% Max (1 ppm)
Free Chlorine	0.0005% Max (5 ppm)
Organics	0.0005% Max (5 ppm)

Records Found: 21 Item(s) in 21 Part(s) - Search Duration: 0 minutes and 1 seconds

NRG's chemical specifications can be stored in their online catalog. The supplier is provided with this specification at the time a purchase order is submitted to ensure the proper material with the correct specification is delivered to the site.

Chemical Gatekeeping- Online



Licensed to NRG Energy Inc.

Application Help

Chemical Orders Inventory Cat Add Waste Pickup Mgmt Shipping Reports Users Admin Stop Print Scr

Request Info:
Starting Point:
New Approval(577932)
View:
Viewer
Request Number:
149422
Requested On:
Aug 02, 2010

Sections
Section 1 of 3
Section 2 of 3
Section 3 of 3

Actions
Submit
Delete
Approve
Appr.Detail

Section: Material / Size Requestor: Lindner, Gary R. (512-519-3941) Status: Ready to Order Submitted: Aug 02, 2010

Part 1
New Material

Manufacturer - 240 chars max: *
Aqua Solutions
Material Description - 240 chars max: * (Include
Phenylarsine Oxide Titrant 0.00564N
Manufacturer's Trade name - 100 chars max: * (I
Phenylarsine Oxide Titrant 0.00564N (6740
Manufacturer's Recommended Shelf Life @ Sto

New Size / Packing

Manufacturer Part Number:
6740
per part: * Size: * Unit: *
1 1.0 liter

Approval Detail

Request ID: 149422 Request Date: Aug 02, 2010
Requestor: Lindner, Gary Facility: Cedar Bayou
Status: Ready to Order Work Area:

Material Desc.	Packaging	Manufacturer
Phenylarsine Oxide Titrant 0.00564N	1 x 1 liter in plastic bottle	Aqua Solutions

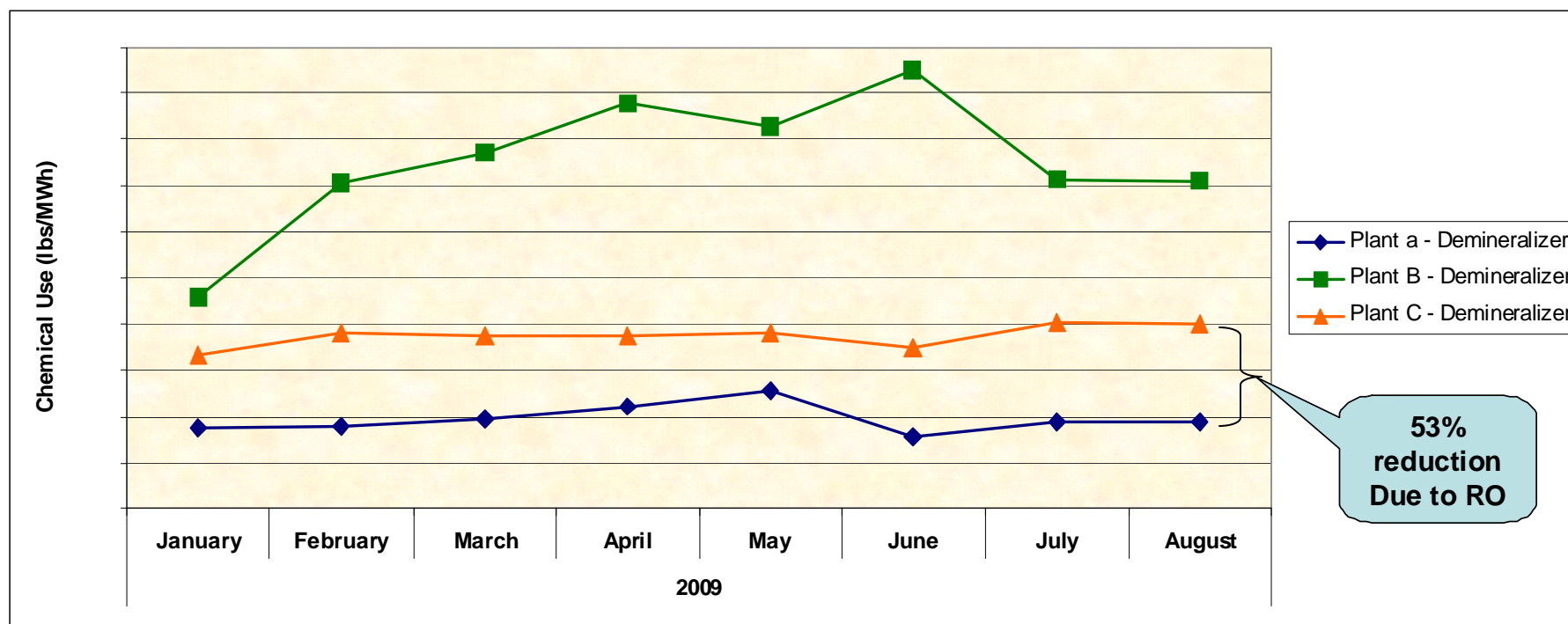
Approval Role	Status	Chemical Approver	Date	Comments
TCM QC	Approved	TCM,Data Center	Aug 02, 2010	Auto approved
Pricing	Approved	Albachten,Sally	Aug 02, 2010	
Plant	Approved	Smith,Carolann	Aug 03, 2010	

The chemical gatekeeping feature in *tcmlS*® creates an approval chain that must be followed for all new chemicals entering the plant site. Designated NRG staff must review and approve the new chemical addition before an order can be submitted. Limits can also be set on the volume or frequency of purchase for specific users and work areas, and allows the ability to require second-level approvers if necessary.

Chemical Efficiency Tracking

- Track chemical cost and use per MWh produced
- Short-term value to analyze process “trends”
- Long-term value to identify process improvement
- Share best practices throughout the fleet

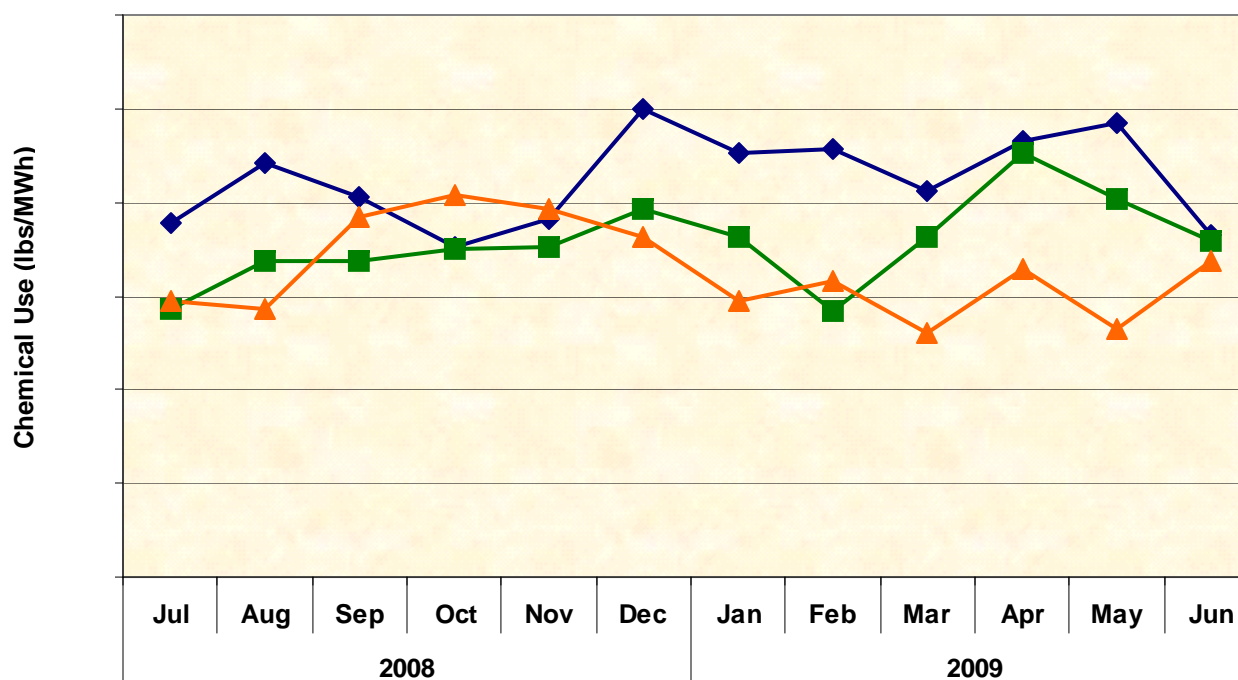
Example: Sulfuric Acid Use Per MWh for Demineralization



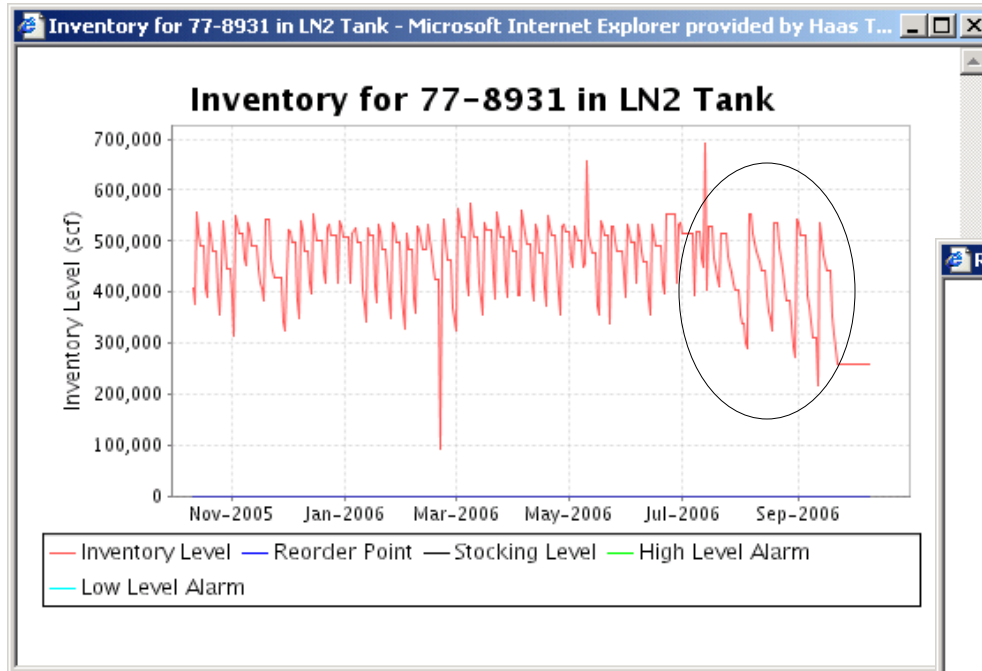
Chemical Efficiency Benchmarking

- Track and compare chemical efficiencies across industry peers
- Use “normalized” data to help drive improvement initiatives
- Help define “best practices” for chemicals use

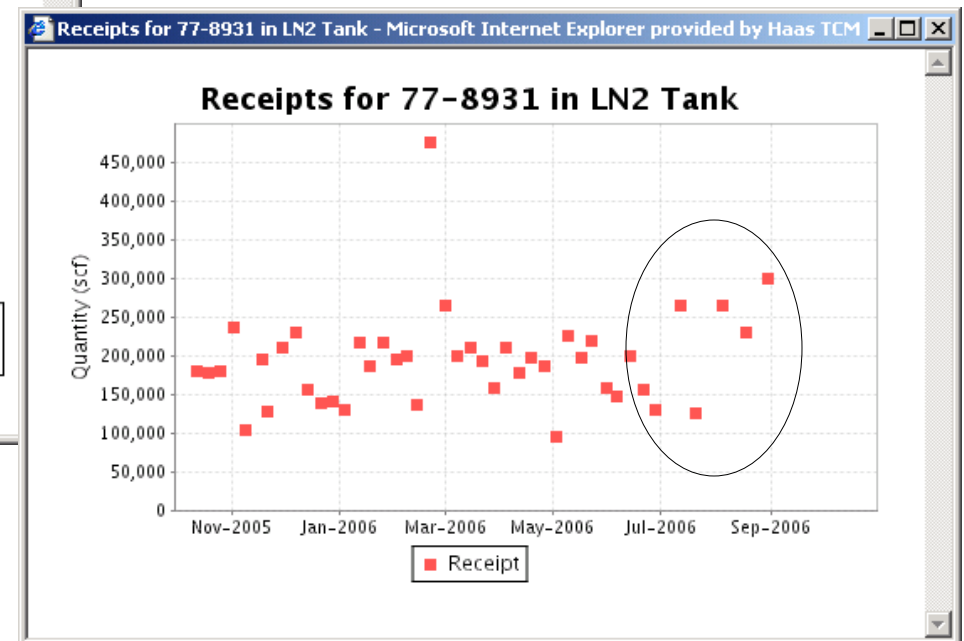
Example: Chemical Use Per MWh-Caustic for Demineralizer
NRG Plant vs. other companies



Logistical Efficiencies



Tank replenishment managed to ensure continual supply while reducing the number of deliveries and working within Plant high and low-level alarms.



Results: Ask the Experts



Quotes from plant and procurement employees:

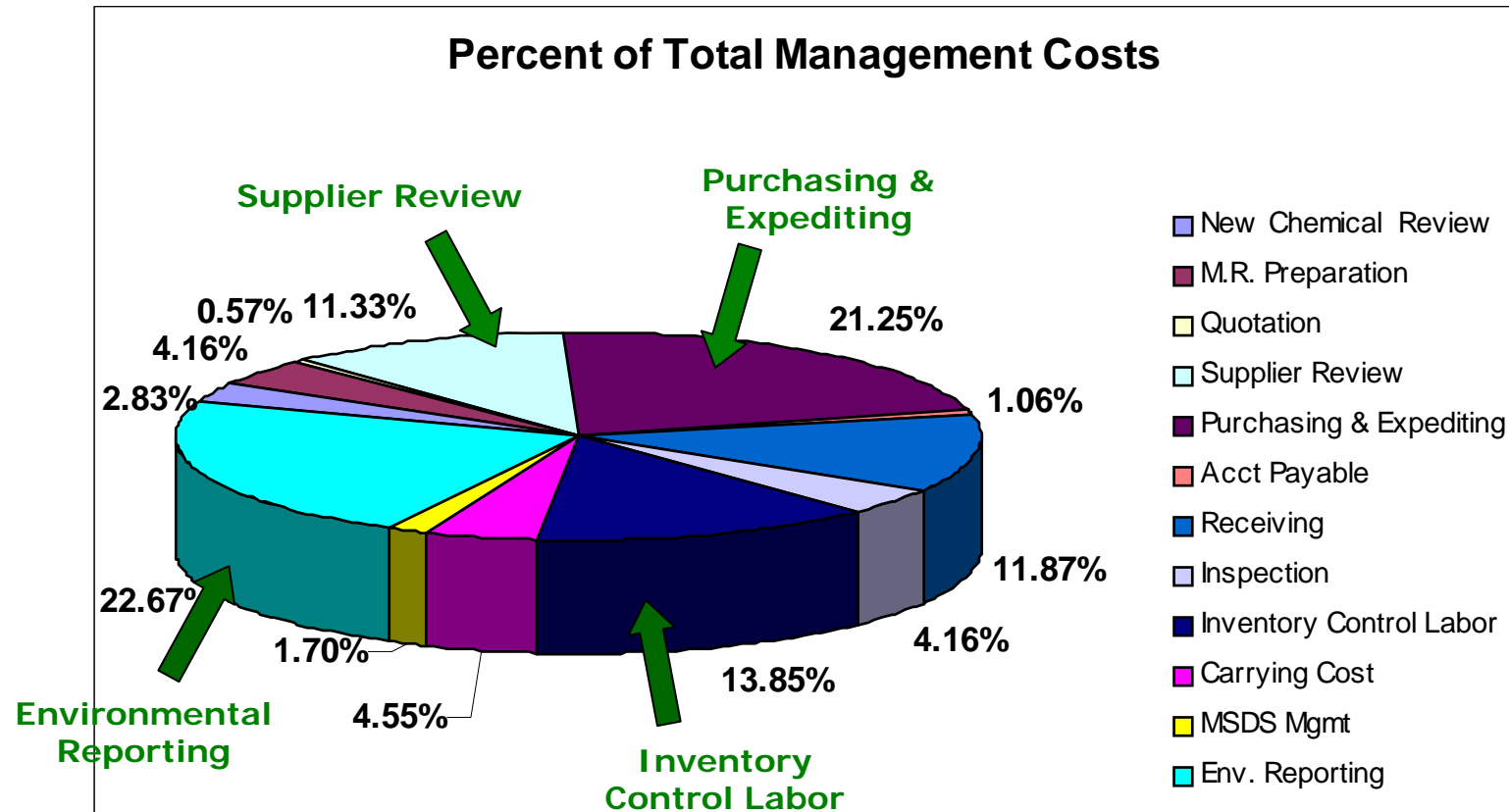
"Improved safety- trained professionals visit weekly, take inventory, inspect, draft order and handle chemicals."

"At first I did not want to try it, but this is so much easier. Budgeting and invoicing save me a couple of days a month."

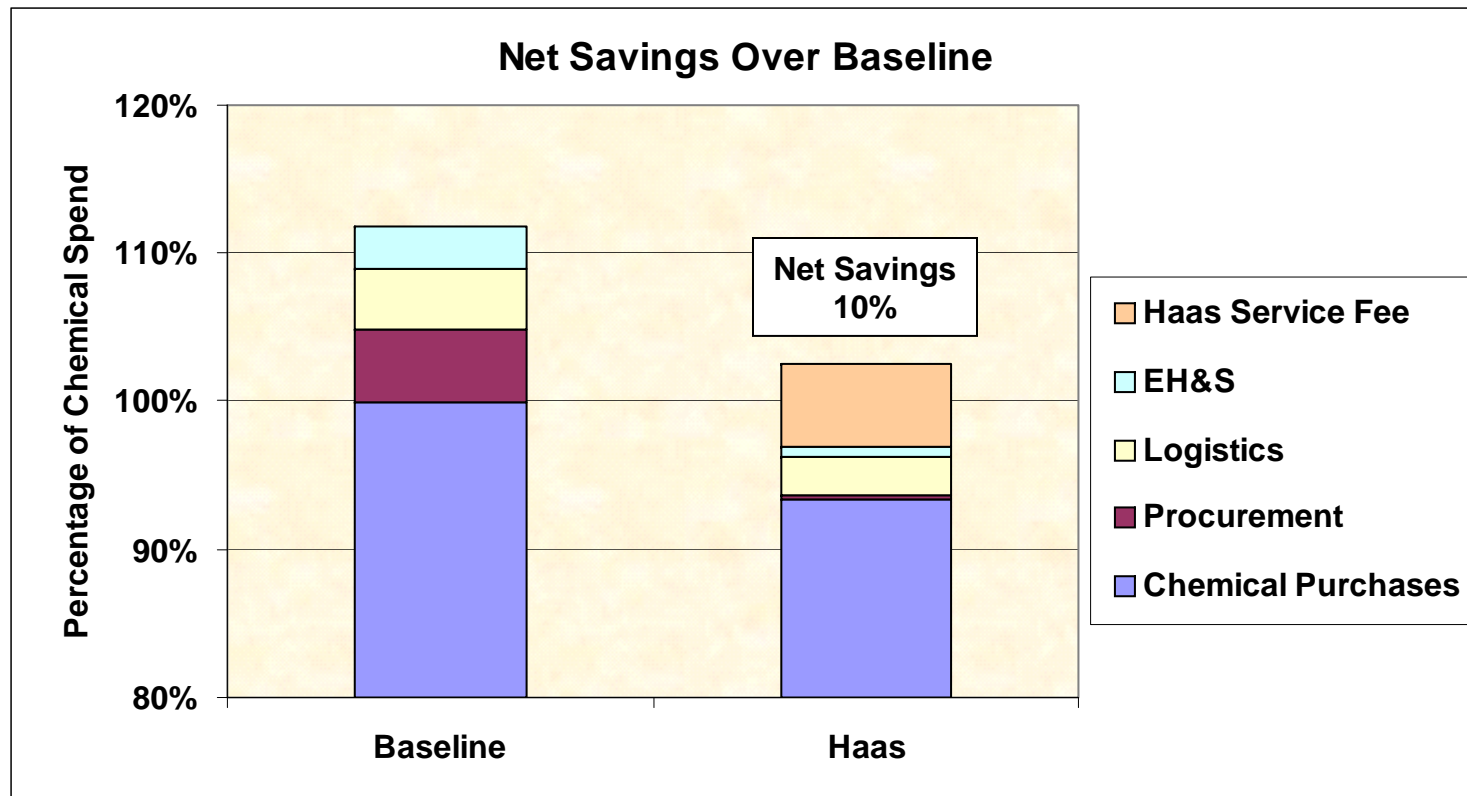
"Reduces the truck traffic to the plant, saving GHG and other pollutant emissions and having less impact on the neighbors."

"HAAS provided input in the design of chemical handling for new back end controls including WWT upgrades"

"Direct savings- about 10% annually"



Baseline lifecycle management costs were determined by monetizing the level of activity for each function



- NRG has realized an annual net savings of 8%, inclusive of the Haas service fee, for managing their chemical supply chain.
- Level of effort significantly reduced for EH&S staff due to compliance automation through the environmental reporting functions in tcmlS



Adding value to the supply chain- 2 kinds of green



Drive Sustainable Programs



Minneapolis 2008