LIFE CYCLE ASSESSMENT: A TOOL FOR PROTECTING DEFENSE ASSETS

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(Energy, Installations, and Environment)

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AGENDA

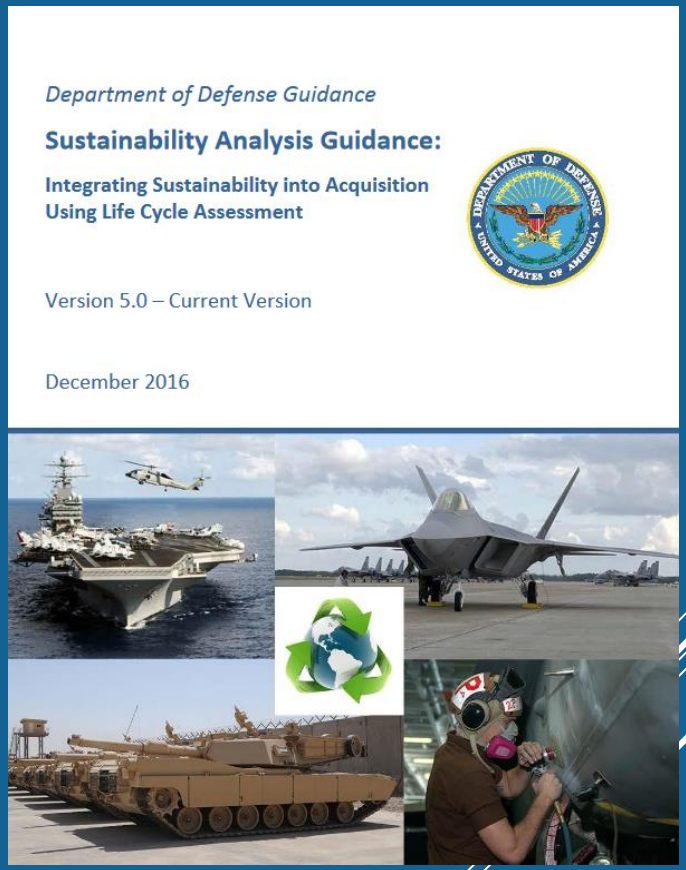
- Policy
  - Sustainability Analysis Guidance
- People
  - DoD Community of Interest
  - Federal LCA Commons
- Practice
  - Pilot Projects

SUSTAINABILITY ANALYSIS GUIDANCE

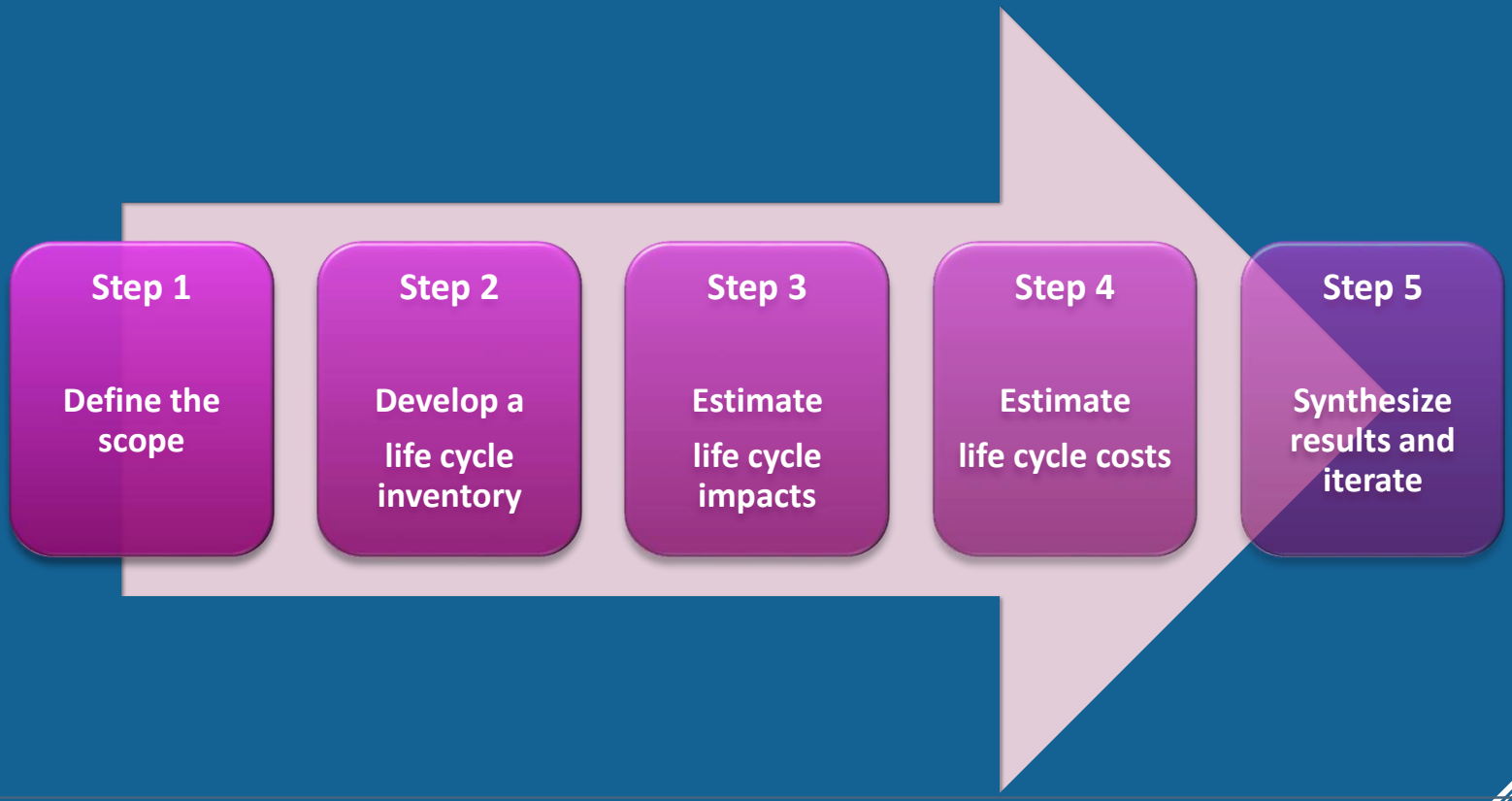
INTEGRATING SUSTAINABILITY INTO ACQUISITION USING LIFE CYCLE ASSESSMENT

Sustainability Analysis = LCA + LCC

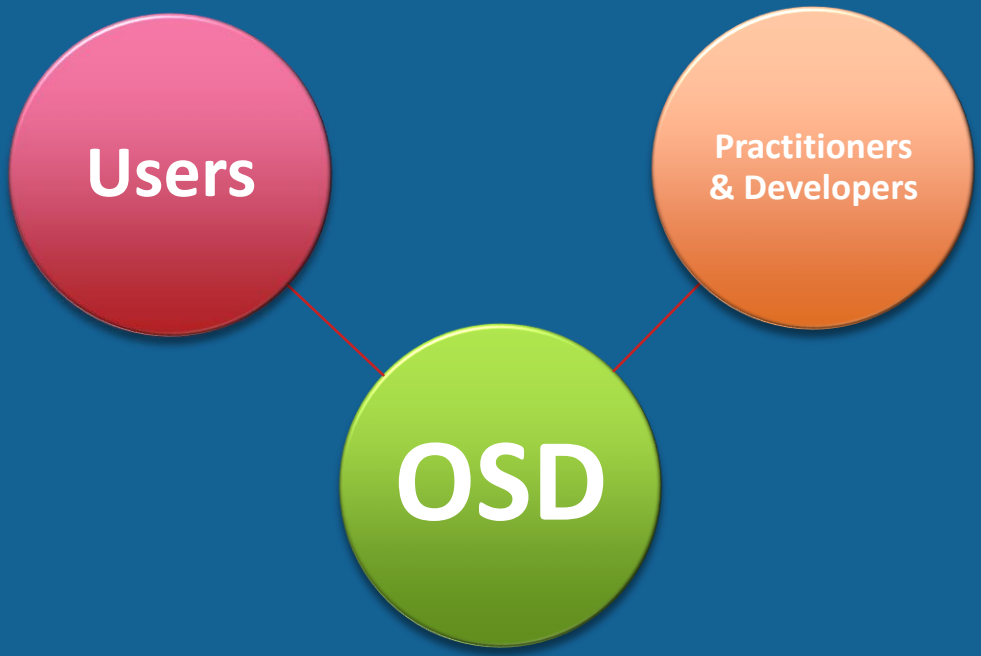
- Consistent, practical, flexible methodology
- Identifies most sustainable alternative among those that meet performance requirements
- Uncovers previously hidden human health and environmental impacts and their associated life cycle costs
- http://www.denix.osd.mil/esohacq/home/



SUSTAINABILITY ANALYSIS METHODOLOGY



SUSTAINABILITY ANALYSIS COMMUNITY OF INTEREST



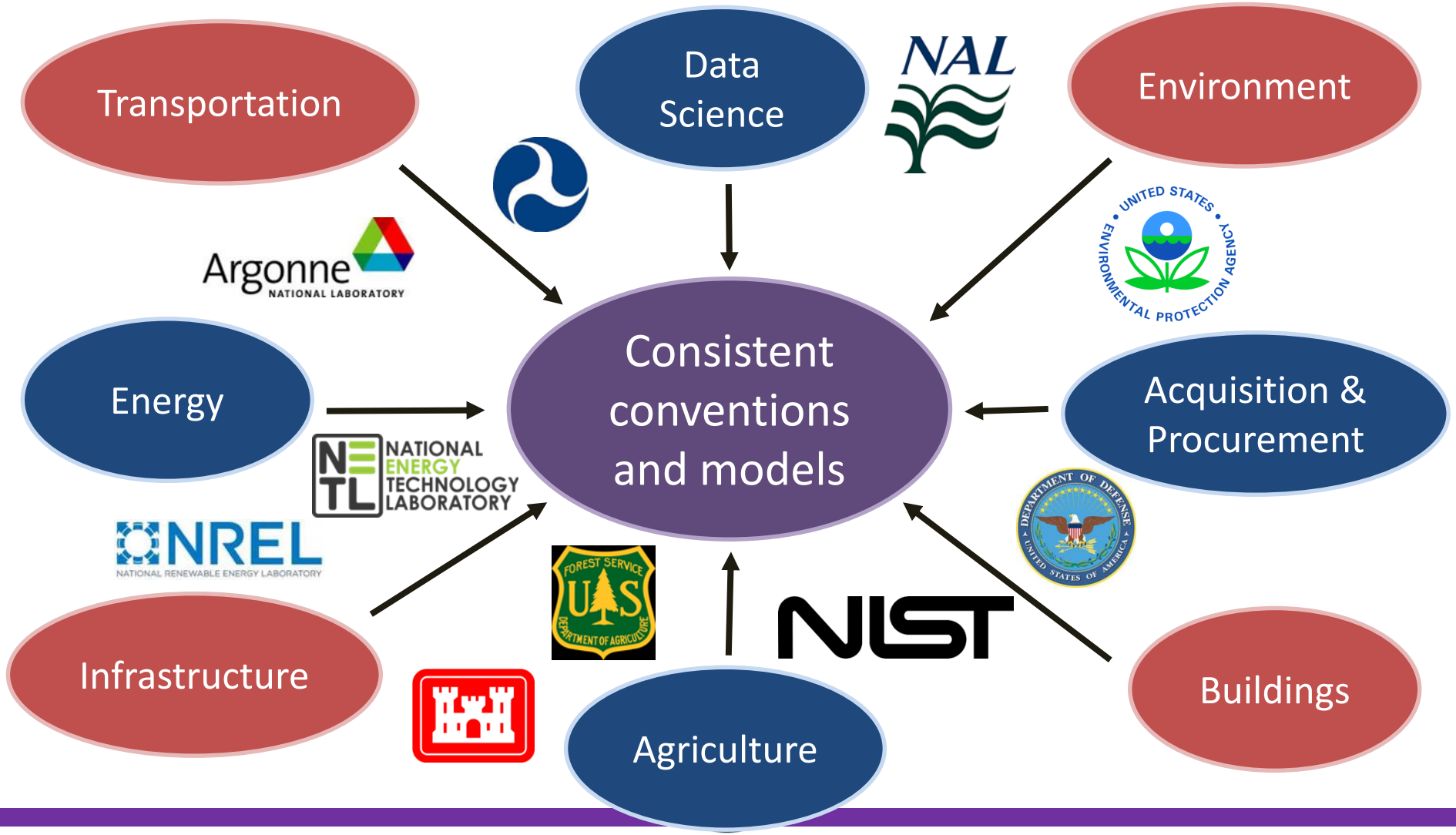
Current Examples

ESOH
SERDP-ESTCP
Systems Engineering
AFLCMC
FRCSE
GE
ERDC
Lockheed Martin

FEDERAL LCA COMMONS

How We Collaborate

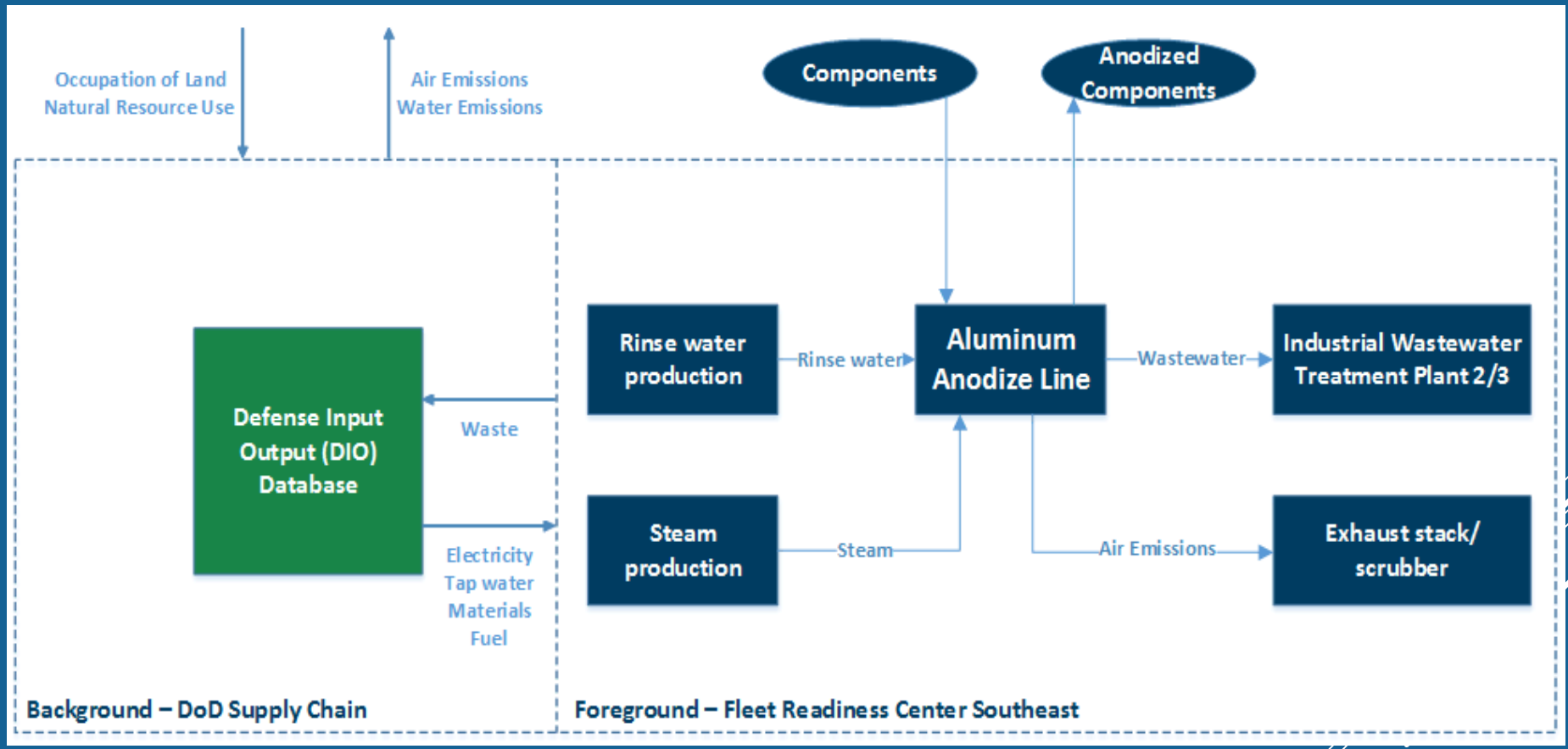
Interagency **Community-of-Practice** around LCA



PILOT PROJECT

NAVAL AIR SYSTEMS COMMAND
FLEET READINESS CENTER SOUTHEAST (FRCSE)

SCOPE


Occupation of Land
Natural Resource Use
Air Emissions
Water Emissions
Components
Anodized Components
Defense Input Output (DIO) Database
Waste
Electricity
Tap water
Materials
Fuel
Rinse water production
Rinse water
Aluminum Anodize Line
Wastewater
Industrial Wastewater Treatment Plant 2/3
Steam production
Steam
Air Emissions
Exhaust stack/ scrubber
Background – DoD Supply Chain
Foreground – Fleet Readiness Center Southeast

LIFE CYCLE INVENTORY

OLD/RAISED ANODIZE LINE (UNIT PROCESS)

Material inputs (old/raised line) Tape, brite pads, and other supporting materials are outside the scope of this study

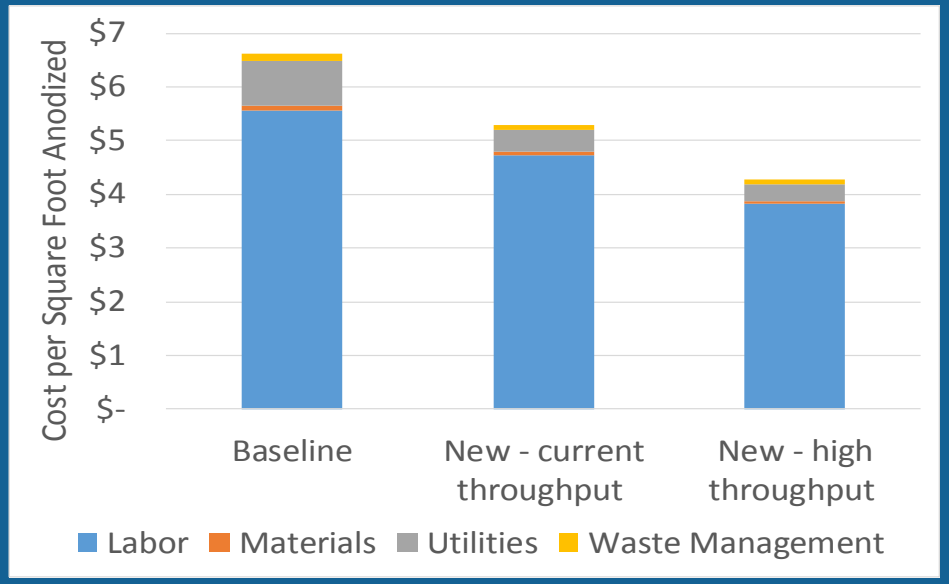
Description	Usage	Units	Annual Usage		Cost	Units	Cost per Year	NAICS	Data Source(s)
Sodium dichromate	70	lbs/year	70.000	$	326.74	$/100 lbs	$ 228.72	325180 Other Basic Inorganic Chemical Manufacturing	FRCSE consumable records
Aluminum ball cathodes	0.67	cathode/year	0.67		$1,000.00	$/cathode	$ 666.67	332812 Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to	FRCSE Metalast ROI/CBA
Sulfuric acid	201.33	gal/year	201.33	$	210.00	$/6.5 gal	$ 6,504.62	325180 Sulfuric acid manufacturing	FRCSE consumable records
Aluminum sulfate	80.58	lbs/year	80.58	$	22.75	$/50 lbs	$ 36.67	325180 aluminum sulfate manufacturing	FRCSE consumable records

Amount used in a year

Annual cost

Link to DIO (supply chain)

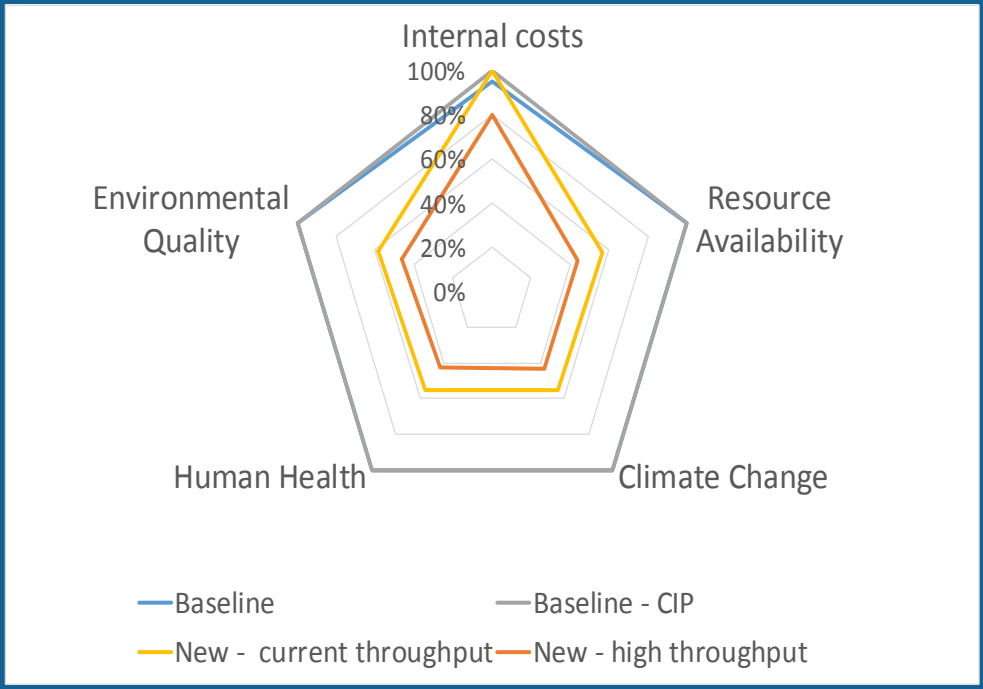
LIFE CYCLE COSTING



	Baseline	Baseline – with CI	New – current throughput	New – high throughput
Initial Costs (occur in year 0)				
Equipment & Materials	$-	$1.51	$23.38	$17.99
Labor	$-	$0.84	$-	$-
Annual Costs (recurring)				
Labor	$5.56	$5.56	$4.72	$3.81

	Baseline	Baseline – with CI	New – current throughput	New – high throughput
Materials	$0.09	$0.09	$0.07	$0.05
Utilities	$0.84	$0.84	$0.41	$0.32
Waste Management	$0.13	$0.13	$0.09	$0.09
Net Present Value	**$91.01**	**$95.65**	**$96.19**	**$76.80**

INTEGRATED IMPACT & COST RESULTS



Alternative	Internal costs	Resource Availability	Climate Change	Human Health	Environmental Quality
Units	*USD*	*MJ extra*	*kg CO2-eq*	*DALY*	*PDF*m2*yr*
Baseline	1.1E+2	1.5E+6	8.5E+5	5.1E-1	8.2E+3
Baseline - CIP	1.2E+2	1.5E+6	8.5E+5	5.1E-1	8.2E+3
New - current throughput	1.2E+2	8.4E+5	4.7E+5	2.8E-1	4.8E+3
New - high throughput	9.6E+1	6.5E+5	3.7E+5	2.2E-1	3.8E+3

THANK YOU

Check it out!

SERDP-ESTCP Symposium, Washington, DC

Short Course: Sustainability Analysis - Capturing Life Cycle Impacts and Costs in Defense Systems

November 30, 2017

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