



Measuring Research Impact in a Lean Management System: Experience of EPA's Office of Research of Development

2019 National Science and Technology Council (NSTC) Conference

Building Bridges Across the S&T Enterprise

June 14, 2019

Components of Lean Management System





EPA FY18-22 Transformation Strategy



Air Strategic Measure:
Reduce number of non-attainment areas from 166 to 101

Water Strategic Measure:
Reduce number of community water systems out of compliance with health-based standards from 3600 to 2700

Research Strategic Measure:
Increase number of products that meet customer needs

Agency Priority Goal (APG)	Strategic Measures (FY18-22)
<ul style="list-style-type: none"> Reduce number of non-attainment areas from 166 to 101 (2019 APG = 138) Reduce number of community water systems out of compliance with health-based standards from 3,600 to 2,700 Increase by \$40 billion the non-federal dollars leveraged by EPA water infrastructure finance programs (2019 APG = increase by \$16 billion) Reduce number of square miles of watershed with surface water not meeting standards by 37,000 square miles Make 255 additional Superfund sites Ready for Anticipated Use (RAU) (2019 APG = 102 additional) Make 3,420 additional Brownfields sites RAU (2019 APG = 1,368 additional) Make 536 additional Resource Conservation and Recovery Act (RCRA) corrective action facilities RAU 	<ul style="list-style-type: none"> Complete 56,000 additional Leaking Underground Storage Tank (LUST) cleanups that meet risk-based standards Complete all EPA-initiated Toxic Substances Control Act (TSCA) risk evaluations for existing chemicals in accordance with statutory timelines (2019 APG = 100%) Complete all TSCA risk management actions for existing chemicals in accordance with statutory timelines (2019 APG = 100%) Complete all TSCA pre-manufacture notice final determinations in accordance with statutory timelines (2019 APG = 80%) Complete all cases of Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)-mandated decisions for the pesticides registration review program Reduce Pesticide Registration Improvement Act (PRIA) registration decision timeframe by an average of 60 days
<ul style="list-style-type: none"> Increase number of grant commitments achieved by states, tribes, and local communities Increase use of alternative shared governance approaches to address state, tribal, and local community reviews 	<ul style="list-style-type: none"> Eliminate backlog and meet statutory deadlines for responding to Freedom of Information Act (FOIA) requests
<ul style="list-style-type: none"> Reduce average time from violation identification to correction Increase environmental law compliance rate (2019 APG = reduce Clean Water Act National Pollutant Discharge Elimination System (NPDES) permittees in significant noncompliance with their permit limits from 24% to 21%) Meet 100% of legal deadlines imposed on EPA Eliminate unnecessary or duplicative reporting burdens to the regulated community by 10,000,000 hours Increase number of research products meeting customer needs 	<ul style="list-style-type: none"> Reach all permitting-related decisions within 6 months (2019 APG = Reduce by 50% those exceeding 6 months) Reduce unused office and warehouse space by 850,641 square feet Reduce procurement processing times by achieving 100% of procurement action lead times Improve 250 operational processes Increase enterprise adoption of shared services by four

Reform Plan Priority Areas (FY19-22)	
<ul style="list-style-type: none"> Eliminating the State Implementation Plan (SIP) backlog Tailoring state oversight Examining EPA field presence Increasing flexibility in state and tribal assistance Maximizing infrastructure investments Speeding up FOIA responses 	<ul style="list-style-type: none"> Reducing unnecessary industry reporting burden Improving management of EPA laboratories Speeding up environmental permitting Speeding up the EPA acquisition process Enhancing Human Resource shared services centers

EPA Transformation Strategy on a Page

current as of February 12, 2018



EPA Research Strategic Measure (reported annually as GPRA Measure)

- Increase the percentage of research products that meet customer needs*
 - FY18 Performance: 77%
 - FY19 Target: 77%
 - FY20 Target: 80%
- **Meeting customer needs** is defined by three criteria:
 - Quality
 - Usability
 - Timeliness
- **Customer** = EPA Program Office/Region (currently)



Meeting Customer Needs

Quality - The extent to which a research product meets scientific and technical standards, is rigorous and transparent, and advances the state of knowledge for a particular topic. A product is high quality if:

- It was developed in accordance with the ORD science and data policies, including but not limited to quality assurance and peer review.
- It is peer reviewed and published by the broader scientific community.
- Is sufficiently rigorous and transparent to support EPA regulatory and non-regulatory work.

Usability – The degree to which a research product is suited for and easily applied to actions within EPA’s mission. A product is highly usable if:

- It provides information relevant to customer decisions or actions. The product informs the Agency and partners on scientific uncertainties, risk interpretations and future data needs.
- The product, along with key data and source material, are readily accessible to the intended audience.
- Sufficient engagement and support is provided to the intended customer to allow for full applicability

Timeliness – whether a product is delivered within a timeframe appropriate for customer use. A product is considered timely if:

- The anticipated product delivery date is determined considering customer use expectations.
- It is delivered by the anticipated delivery date.



Metric to Evaluate Strategic Measure

The EPA Office of Research and Development developed a metric to be used to report on the Strategic Measure.

- This metric scores individual products on a 100-point scale
- A product “meets customer needs” if its score exceeds this threshold (85 of 100)
- Metric used survey instrument as well as internal data.
 - 70 points come from customer survey
 - 30 points come from internal ORD sources
- The survey an estimated 15 minutes to complete

Sample Question:

“The product is designed or presented in a way that is user-friendly for me.”

1

Strongly Disagree

2

Disagree

3

Neutral

4

Agree

5

Strongly Agree

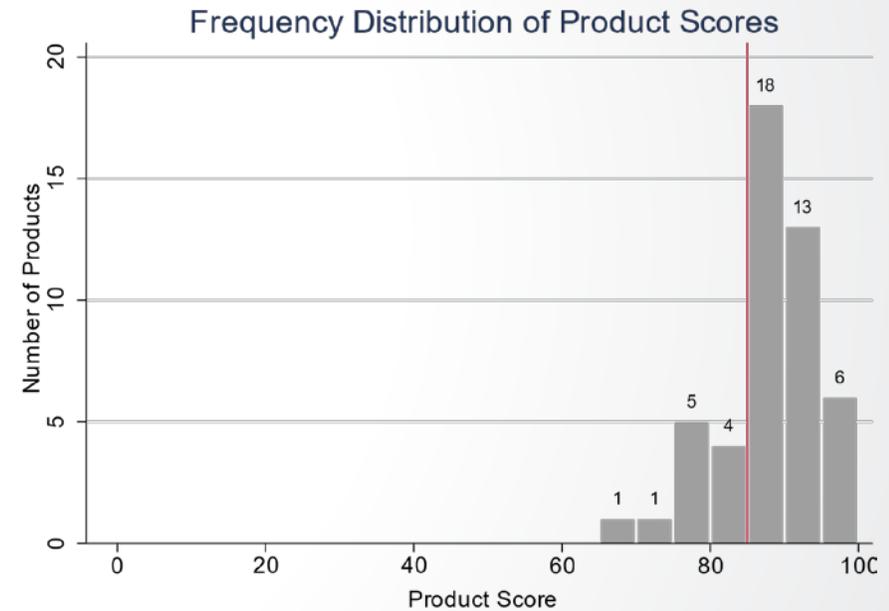
100-Point Scale Breakdown

Data Source: Survey		Data Source: ORD
Usability Questions 50		Clearance and Peer Review (Quality) 20
Timeliness Questions 10	Quality Questions 10	Clearance Date (Timeliness) 10



FY18 Results for FY17 Products

- Mean product score: 87.39 out of 100
- 37 of 48 products (77%) scored greater than or equal to 85 (met customer needs)





Key Take Away Messages

- EPA's Strategic Plan and Lean Management System are driven by measures related to organization goals/objectives/performance.
- Difficult to identify a single metric to evaluate the impact of research
 - Measurable/Quantifiable
 - Time lag
 - Variety of stakeholders
- Challenges with survey instrument
 - Response rate
 - Inherent biases
 - Reaching external customers
- EPA is reporting results of its Strategic Measure for research to meet GPRA requirements and continues to search for and evaluate/assess other approaches for measuring the impact of its research.