E-Enterprise for the Environment Conceptual Blueprint: Principles and Components

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Conceptual Blueprint for E-Enterprise for the Environment: Executive Summary

Overview

E-Enterprise for the Environment (E-Enterprise) is a U.S. EPA-state initiative to improve environmental performance and enhance services to the regulated community, environmental agencies, and the public. E-Enterprise will increase transparency and efficiency, develop new environmental management approaches, and employ advanced information and monitoring technologies in a coordinated effort to manage and modernize environmental programs. Some state and EPA programs have begun to streamline and modernize environmental programs and develop sophisticated and advanced information management and monitoring projects. E-Enterprise will build on these experiences. The rationale for E-Enterprise is that states and EPA can move forward more quickly together, as one enterprise, by coordinating investments, implementing joint program improvements and technologies, and achieving economies of scale. Full realization of the E-Enterprise vision requires states and EPA to collectively recast the business model of environmental protection for the United States and, in doing so, redefine how regulators interact among themselves, with regulated entities, and with the public.

E-Enterprise for the Environment: The Environmental Regulator Perspective

Some of the benefits regulators can expect from E-Enterprise are:

- Opportunities to collaboratively engage earlier and more effectively in rulemaking, program development and ongoing management.
- A forum for identifying and changing business processes that don't add sufficient value.
- Greater emphasis on innovative environmental management approaches.
- Investments in appropriate information technology and advanced monitoring that support improved environmental outcomes and enhanced service to the regulated community.
- Improved access to and use of timelier, more integrated and higher quality information in the decision-making process.
- Improved credibility with both the regulated community and the public through greater transparency, streamlined processes and updated technology.
- Opportunities for significant cost savings from sharing information technology systems and tools.
- Grants to states to help offset the costs of change, to enable complimentary development efforts and to encourage innovation.
- Application of advanced monitoring and information technologies would allow environmental problems to be spotted and corrected sooner and would add valuable tools to the toolbox for environmental protection programs.

Over the past year, EPA and the states have worked together to scope and refine the E-Enterprise vision. The State-EPA E-Enterprise Working Group empanelled a Blueprint Team and commissioned a Conceptual Blueprint (Blueprint) document to define the principles and primary components of E-Enterprise. This Blueprint is the first step in defining E-Enterprise; subsequent efforts will identify E-Enterprise implementation details. A new state-EPA governance body, the E-Enterprise Leadership Council (EELC), patterned after the successful model of the Exchange Network Leadership Council (ENLC), will now assume leadership and oversee and coordinate E-Enterprise implementation. The business of environmental protection will look very different in 25 years and the seeds of this progress are now in our hands. The Blueprint seeks to identify these seeds and describe how, in partnership, they will be planted and tended.

The Blueprint focuses on the state-EPA relationship. As E-Enterprise moves forward, EPA and states will broaden the collaboration to include tribes, municipalities and other environmental authorities. We plan to invite tribes to join the states and EPA in the governance of E-Enterprise, similar to how tribes participate in the Exchange Network Leadership Council. E-Enterprise will also invite input from the regulated community, non-governmental organizations, educational institutions and the public.

E-Enterprise Design and Operating Principles

The Blueprint team began its work by defining a set of design and operating principles. The principles are a set of grounding assumptions and many echo broader themes of federal and state IT e-government policies (e.g., The White House Digital Government Strategy). The principles reinforce that E-Enterprise is, first and foremost, a collaborative effort to modernize and improve environmental programs and regulations and to do so, in part, by investing in information technology advancements and advanced monitoring technologies and considering new ways of protecting the environment.

The design and operating principles are a set of joint state-EPA commitments to:

1. Manage E-Enterprise from the beginning as a partnership led by a joint governance body and work together to develop funding mechanisms and inform the independent resource investment decisions of partners.
2. Respect existing delegations and operating agreements throughout program changes that are driven by E-Enterprise. If seizing improvement opportunities calls for changes, negotiate these changes through existing channels.
3. Streamline and modernize programs before automating them. Streamlining and modernizing programs includes exploring use of new environmental management approaches to harness program improvements and technologies. New environmental management approaches may require tackling challenging or controversial issues, regulatory changes, and take a long time to complete.

E-Enterprise for the Environment: The Regulated Community Perspective

Regulated entities are expected to benefit from E-Enterprise in many ways, such as:

- Saving time and money by moving away from cumbersome paper-based reporting to streamlined, electronic reporting.
- Using "smart" online tools that help regulated entities understand their regulatory requirements and guide them through the reporting process.
- Allowing regulated entities to satisfy their federal and state reporting requirements in an integrated, streamlined manner, similar to how individuals can electronically prepare their federal and state tax forms using integrated software that reuses common data across the forms.
- Providing opportunities to do business with the regulators in a manner similar to the e-business models we are already using in banking and shopping.

A centerpiece of E-Enterprise will be the development of a new federal regulated facility portal, designed from the ground up to provide better interfaces and tools. The design approach for this portal will be "customer centric" and will include a broad based outreach effort. The outreach will validate assumptions regarding desired service improvements and identify new functionality or business process changes that will reduce burden and improve data quality.

4. Use a business case approach[1] to prioritize activities.
5. Ensure that the program and system development explicitly takes into account the user's perspective.
6. Establish a seamless and secure network of services and systems to improve two-way business transactions between the regulated community and partners and among partners.
7. Ensure systems will work smoothly together, for staff, regulated entities, and the public.
8. Automate access to data to promote re-use of information and services by users and their application developers.
9. Explore the integration of advanced monitoring, data collection, and analysis techniques into programs and explore the new management approaches they might enable.
10. Lower cost of program and technical implementation by providing funding and shared infrastructure.

E-Enterprise for the Environment: The Public Perspective

E-Enterprise will improve public access to environmental information and improve transparency regarding environmental decisions and conditions. Through a new online portal, the public will be able to establish user profiles to design custom pages tailored to contain information of interest. For example, a user could establish an information feed for the water quality of a nearby watershed, or monitor the progress of a nearby facility re-permitting process. States and EPA will also expand the availability of information in ways that enable development of mobile "apps."

EPA and States will implement new monitoring technologies and tools to deliver new kinds of environmental data to the public. These advances include technologies which allow real time monitoring of pollutants in air and water, cameras which can make previously invisible pollution visible, and miniaturization which can turn a smart phone into a sophisticated monitoring tool. These technologies open up entirely new approaches to monitoring environmental conditions and facility discharges and enlarge the base of potential monitors to include what is often called "citizen science." And most importantly, the overall objective of E-Enterprise for the Environment is to improve environmental protection in this country.

E-Enterprise Components

The Conceptual Blueprint identifies six E-Enterprise components. The components span the spectrum of technical, programmatic, and advanced monitoring aspects of E-Enterprise and in many cases represent the concrete embodiment of one or more of the principles.

The E-Enterprise Components are:

1. *Modernizing and Streamlining Programs and Regulations*: E-Enterprise projects will require changes to the underlying programs and regulations. This component defines the types and levels of these changes, and how they will impact the spectrum of environmental business processes. This component actualizes the principle to proactively examine the business case for streamlining, modernizing, or developing new approaches while looking to automate existing processes. E-Enterprise distinguishes between program reforms (i.e., improvements to existing programs) and new management approaches (i.e., new types of activities). It also assumes that both types of changes could be made on their own or be enabled by advanced monitoring and

[1] EPA is currently developing a framework for analyzing the business case for each E-Enterprise proposal for funding. The business case will consider the return on investment for each project as well as broader benefits and impacts. This will enable decision makers to have a consistent set of criteria to apply when evaluating the value of a particular project in advancing the vision and objectives of E-Enterprise.

information technology. Changing how programs operate may require altering the interactions between EPA, states, tribes, local entities, as well as changes in the approaches used to influence the regulated community.

2. The E-Enterprise Advanced Monitoring component is a *Portfolio of Advanced Monitoring Technologies, and New Data Collection and Analysis Techniques*. This E-Enterprise component will establish a portfolio of ready-to-implement advanced monitoring and data collection and analysis solutions, and promote the adoption of these solutions under a model of "build once, use many times." This component also includes an ongoing program to develop new solutions for advanced monitoring technologies and new data collection and analysis techniques. The three aspects of this component are inter-related: new monitoring technologies (e.g. a new sensor) will enable new data collection techniques and these collection techniques will in turn produce (often large) sets of data which will require new analysis techniques to interpret, communicate, and use the data. If successful, states and EPA will routinely build these technologies into our programs and use them to achieve improved environmental performance. At that point, they will no longer be considered "advanced." Note that the goal of E-Enterprise is the adoption of proven technologies; while E-Enterprise may support the pilot integration of technologies/techniques into programs; it is not a research and development program.

3. *The E-Enterprise Portal*. As one of the signature E-Enterprise investments, EPA intends to launch a major new portal (E-Enterprise Portal). This portal, or set of portals, will have two major functions:
   A. There will be a regulatory portal to provide an integrated platform through which EPA can offer a growing set of e-transaction services, including e-reporting, e-notifications, and compliance assistance resources. Facilities will be able to customize their own homepages and have ready access to all transactions in one place. To the extent possible, E-Enterprise will seek to ensure that state and EPA portals are linked together as seamlessly as technically feasible so that users that have business on both can easily move between the two. States and EPA will work toward agreement on a set of technical conventions to make this possible.
   B. There will also be a public portal to improve the transparency of EPA information and improve the public's access to that information. The public portal will provide ready access to environmental information about what is going on in any particular area. More broadly, the public portal will provide access to EPA datasets and tools to allow the public to access data in a clear and simple-to-understand format. The portal will also facilitate the public's ability to provide EPA with environmental data gathered through advanced monitoring and other techniques, including smart phone applications.

4. *Partner Access and Transaction Systems*: This component includes all of the partner e-transaction systems that are related to E-Enterprise. This component is the companion to the E-Enterprise Portal and the goal is to ensure that these systems interact smoothly with the EPA Portal. E-Enterprise envisions new kinds of state-EPA technical collaboration. Previously states had two choices: use their own resources to develop and operate their own systems, with the associated customization and flexibility benefits, or use the EPA national system. Now, with E-Enterprise, there

will be an opportunity to utilize a modular approach in the development of shared technical components and state systems. For instance, EPA can build infrastructure to support common business processes, such as electronic signature or e-reporting capability, provide it as a service, and states can reuse and integrate this 'module' into their systems, thereby preventing duplicative system development. In other cases, states may elect to use an EPA national system to perform some transactions (e.g., receiving electronic DMRs or air emissions reports) by having data reported directly to an EPA-hosted application and then downloading their data for local use. This modular approach can also support mobile systems which, together with process improvements, can produce transformational changes in traditional activities such as inspections. Finally, this approach will enable application developers to create specialized applications for target audiences including agency staff, facilities, and the public.

5. E-Enterprise *Open Data and Web Services*. This component has two aspects: the first is the network of services that will plumb E-Enterprise applications, and the second is the design assertion that all data will be available, with the required level of security, to all authorized or public users. We are not starting from scratch—some of the necessary services are already provided by EPA via the Exchange Network, or via other platforms. Many of these services rely on parts of the E-Enterprise Shared Technical Infrastructure, for example EPA's CDX. This infrastructure is discussed in Component #6, while the services used to access this infrastructure are included in this component.

6. *E-Enterprise Shared Technical and Programmatic Infrastructure*: This component consists of the suite of reusable technical and programmatic infrastructure available to partners to support implementation of their E-Enterprise Projects. The Conceptual Blueprint calls for a high level E-Enterprise solution architecture to guide the development of E-Enterprise shared technical infrastructure. The Blueprint also identifies EPA as the lead partner to develop, operate and provide support for the majority of the E-Enterprise shared technical infrastructure.

Managing E-Enterprise

A new body, the E-Enterprise Leadership Council (EELC), will provide coordination and oversight for E-Enterprise activities. Members of the EELC will be state and EPA senior executives whose principal responsibilities are primarily programmatic rather than information technology management. This programmatic emphasis will allow the EELC to engage on the program and policy issues associated with E-Enterprise implementation. The Exchange Network Leadership Council, working in partnership with EELC, will provide oversight and coordination of technical matters. An E-Enterprise Coordinator will staff the EELC and will manage the work portfolio of the entire E-Enterprise governance and coordinate the flow of issues as they work their way into and through the governance structure.

The EELC will play a key role in soliciting, selecting, prioritizing, and advocating for implementation projects and their resource allocations. The EELC will establish and call for the use of business case analyses to inform its decisions. The EELC may need to manage the real and perceived coordination costs of implementing projects consistent with the E-Enterprise framework. An early follow-on

deliverable to this Blueprint will be a technical solutions architecture which will enable the EELC to say exactly what doing a project the "E-Enterprise way" means for program offices and state system developers.

Next Steps

E-Enterprise is a bold plan that will have a broad reach and a long timeline. It will depend on an effective state-EPA partnership to accelerate the evolution of our programs and speed the integration of new technologies in order to achieve the goals of improved environmental outcomes and the ability to provide 21st century services to stakeholders. While rapid progress is possible in some areas, many of the most far-reaching potential improvements will take time. Planning E-Enterprise activities must begin now to reach a critical mass that enables the operation of its framework and the benefits it provides to become self-evident.

This Blueprint is a living document and the ECOS-EPA E-Enterprise Working Group will formally transmit it to the new EELC as a recommendation. This will allow the EELC to refine and finalize the Blueprint based on the latest information concerning resources, joint governance membership, the status of projects already underway, and other outstanding issues. The Blueprint identifies approximately 30 action items (deliverables) to continue to move forward with E-Enterprise. For instance, the Blueprint calls on the EELC to commission the development of several follow-on products including a "Concept of Operations" for the E-Enterprise Portal, a technical solutions architecture 1.0 for E-Enterprise as a whole, and an E-Enterprise Implementation Plan. Prioritizing and overseeing the implementation of these next steps will be a responsibility of the EELC.

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Preface: Conceptual Blueprint Purpose and Context

This document provides a high level overview of the principles and components of E-Enterprise for the Environment (E-Enterprise). The State-EPA E-Enterprise Working Group (Working Group) and its Blueprint team produced this document, with work starting in April 2013 and completing December 2013. The Conceptual Blueprint (Blueprint) describes the E-Enterprise components, how they operate, and key gaps in our collective knowledge requiring future planning and analysis, and next steps for the Working Group's successor, the E-Enterprise Leadership Council (EELC) to consider. The document is a "conceptual blueprint" because, although it lays out the high-level structure of E-Enterprise, it does not provide sufficient detail for EPA or states to begin building E-Enterprise technology components. After the Working Group vets and recommends it to the EELC, the Blueprint will be the basis for the development of follow-on documents, including a detailed technical architecture to support the needs of several audiences. These audiences include: EPA Office of Environmental Information (OEI) as they develop the supporting technical infrastructure, EPA program offices as they implement projects which must be aligned with E-Enterprise, states where they are implementing projects which must be interoperable with E-Enterprise components, and other regulatory partners.

In developing these follow-on documents, E-Enterprise will face a phasing dilemma caused by the fact that some EPA programs and many states are already moving ahead with e-transaction and public access projects driven by their own schedules. Most of these projects have an information component to them that could and should use some aspect of the E-Enterprise architecture. This, along with the uncertainty of the timing and results of the federal budget process, means the ELLC will need to prioritize new projects and even evaluate how existing projects could be made more consistent with E-Enterprise principles and components. The Working Group prioritized 10 of the next steps as recommendations for the EELC (see Section 7 at end of the document).

The Blueprint focuses on the state-EPA relationship. As E-Enterprise moves forward, EPA and states will broaden the collaboration to include tribes, municipalities and other environmental authorities. We plan to invite tribes to join the states and EPA in the governance of E-Enterprise, similar to how tribes participate in the Exchange Network Leadership Council. E-Enterprise will also invite input from the regulated community, non-governmental organizations, educational institutions and the public.

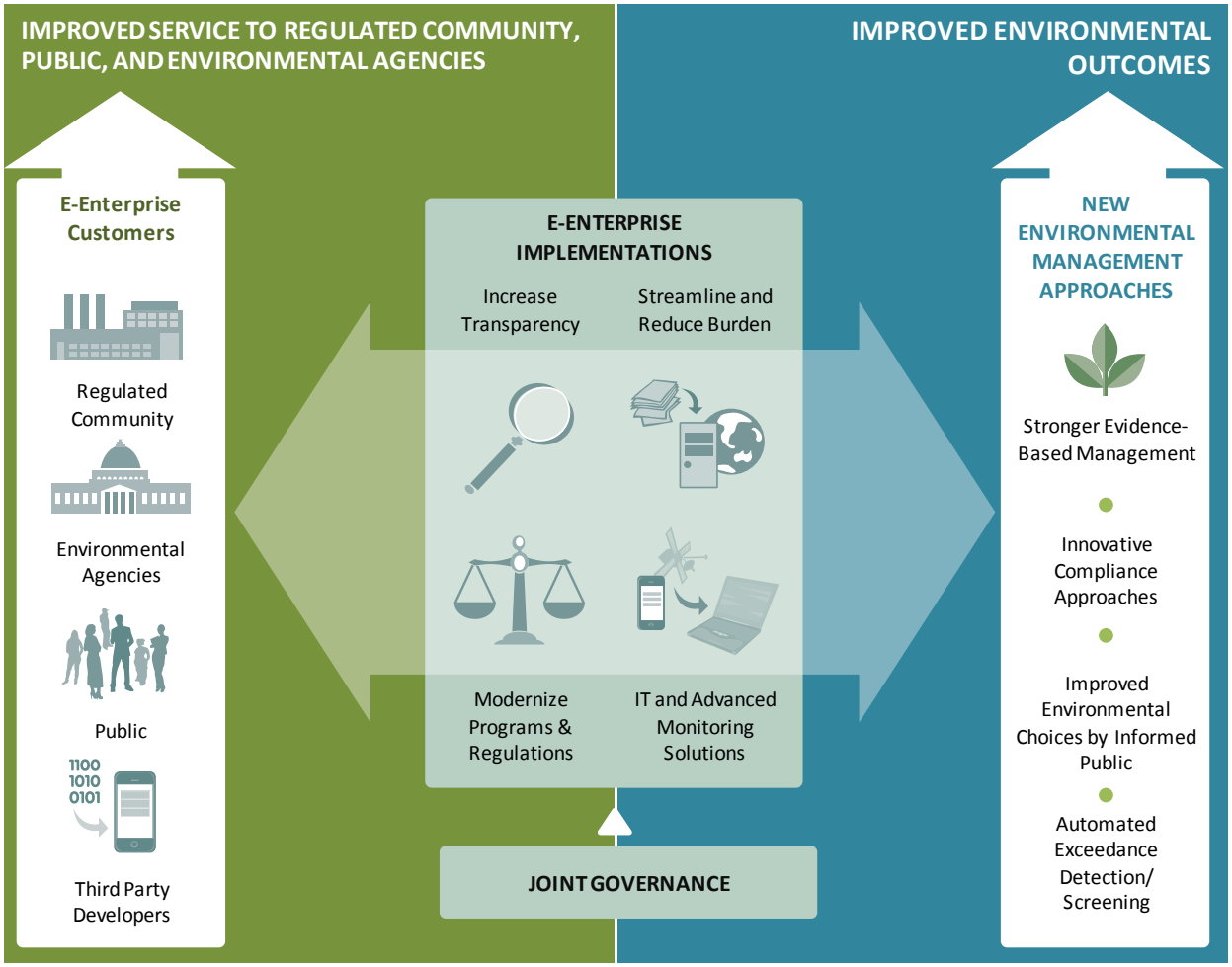
Section 1: The E-Enterprise Vision

Vision Statement: E-Enterprise for the Environment (E-Enterprise) is a joint initiative of states and EPA to improve environmental outcomes and dramatically enhance service to the regulated community and the public by maximizing the use of advanced monitoring and information technologies, optimizing operations, and increasing transparency.

As stated in this vision, E-Enterprise presents a broad plan to improve the way EPA and the States manage environmental programs, provide service to the regulated community and the public, and achieve environmental results. Fully achieving the E-Enterprise vision requires states and EPA to

collectively recast our current business model of environmental protection for the United States and in doing so redefine how regulators interact among themselves, and with regulated entities and the public. Figure 1 illustrates the E-Enterprise vision.

Figure 1: E-Enterprise Vision



As illustrated in this diagram E-Enterprise will improve environmental performance by enabling new environmental management approaches[2] through *program modernization* including *streamlining and improving existing business processes*. E-Enterprise will use the transformational capabilities of *new information technologies* to enable programmatic and service improvements. A fundamental premise of E-Enterprise is that increasing transparency by providing a more integrated (cross-media and cross-jurisdiction) view of environmental performance and conditions will drive greener behavior of the public and regulated entities (See Appendix A). E-Enterprise incorporation of advanced monitoring and data collection techniques will expand the ability of the government, regulated entities, and the public to see, measure, and improve environmental performance and conditions. Enhancing public transparency is

[2] New environmental management approaches refer to new programmatic mechanisms (such as first- or third-party certification, or new forms of targeting). They are highlighted in this Blueprint to emphasize that partners intend to pursue both efficiency improvements of current approaches, and explore new approaches.

both an end goal of E-Enterprise and a key way improve environmental performance by regulated sources, government and the public.

Given the rapidly evolving nature of information technologies and the emerging opportunities in program streamlining and modernization, the focus of the Blueprint is not to attempt to precisely predict all of the specific changes ahead. Instead, the Blueprint provides a high level technical and partnering framework for EPA and states to collectively manage these changes to achieve the E-Enterprise shared vision.

Example: e-Manifest Digital Transition

e-Manifest is a planned electronic option for hazardous waste handlers who use the uniform manifest form (EPA Form 8700-22) to track hazardous waste shipments that are subject to manifest requirements under federal or state law. EPA's Office of Resource Conservation and Recovery is developing a platform that will allow users to initiate, sign, transmit, archive, and retrieve hazardous waste manifests electronically. This will replace 2.1 to 5.1 million manual manifest transactions annually. The platform will also allow state agencies to receive electronic transmissions for manifest tracking. The e-Manifest digital transition will replace paper-based transmission for approximately 30 states and result in annual cost savings exceeding $75 million dollars (2009 study), and annual burden reductions of 300,000-700,000 hours. The non-economic benefits of e-Manifest are also significant, including:

- Greater accountability that will likely result from near real time tracking capabilities
- The much-improved data quality provided by manifest creation and editing aids that will be available in an electronic system
- Greater inspection and oversight efficiencies for regulators who can access manifests more readily with electronic search aids
- Greater transparency which will empower communities with more accurate information about completed waste shipments and management trends
- The efficiencies of consolidating duplicative federal and state waste data reporting requirements with one-stop reporting

The e-Manifest statute embodies several of the major elements of E-enterprise principles, i.e., increasing transparency, enabling two-way electronic business transactions, and reducing regulatory burden. Implementing this statute[3] puts the e-Manifest project in the vanguard of technical development for E-enterprise in terms of business-to-business communications, performance standards for mobile devices, and EPA's Cross-Media Electronic Reporting Regulation (CROMERR) compliant e-signatures. For example, in developing the e-Manifest system, EPA will develop performance standards for mobile devices (including offline capabilities) to track shipments as they move from one place to another, and/or are transferred from one transporter to another. Many of the lessons learned (and complexities overcome) in developing a mobile strategy will be beneficial in developing mobile applications for other agency systems.

[3] The Hazardous Waste Electronic Manifest Establishment Act. Signed into law on October 5, 2012. Available online at: http://www.gpo.gov/fdsys/pkg/BILLS-112s710enr/pdf/BILLS-112s710enr.pdf

Section 2: E-Enterprise Drivers

Environmental agencies face many demands on their programs. Environmental problems and the universe of regulated entities and stakeholders continue to both expand and become more complex; many environmental issues span program areas and jurisdictions, and budgets continue to stagnate or decline. These challenges demand new tools and approaches.

Environmental agencies also face an increasing expectation from the public and regulated community to conduct business online and provide a transparent view into the business of environmental management. Regulated entities and the public expect government agencies to meet the standard for electronic transactions set by online banking and commerce companies by employing "21st Century" information technologies. Often referred to as "working at the speed of business," these expectations include moving away from paper-based systems to online transactions, allowing high volume reporters to fully automate transactions, and enabling third-parties to develop tools to help businesses complete transactions. For example, there is a thriving private sector market for tax preparation software[4]. E-Enterprise also seeks to meet the growing public expectation for easy and personalized access to environmental information. As members of the public become more proficient in using online tools and mobile applications for an ever growing range of transactions, they bring this expectation to their search for environmental information. This expectation includes the ability to establish and return to a customized home page, view data in an informative context and, for advanced users, the ability to download data for their own analysis. These technology trends are both driving expectations and providing the capability to meet these expectations. Appendix B identifies these technology trends and their implications for E-Enterprise.

Environmental agencies also face ever growing needs to share information within and across agencies, reduce staff burden of data entry, gain the benefits of electronic transactions, and meet state and federal technology and information mandates. These mandates include EPA's draft electronic reporting policy which incorporates electronic reporting into the EPA rule making process (see Appendix C). Both federal and state agencies recognize that the ability to more easily share data will facilitate better environmental protection and decision-making while also increasing overall data transparency. The Exchange Network provides a powerful framework for data sharing. E-Enterprise will build on and expand this framework with new data sharing tools which use a common infrastructure and make efficient use of available resources.

Expectations for improved coordination and operational compatibility across levels of government are also growing. E-Enterprise will meet this need by developing new tools and approaches for coordinating state and EPA technology investments and implementations. This will include expanding the system development alternatives available to IT managers by building toward a common set of re-usable services. For example, when both EPA and states must develop cyber security functionality that the

[4] The success of the third party tax preparation software and services model for the IRS is an inspiration to E-Enterprise. One limiting factor is the significantly smaller market size for individual environmental reports vs. the near universal coverage of tax reporting requirements. This smaller market suggests we should have modest expectations, and ensure that we are doing all we can to enable this market. A trend that may help spread such software is the integration of environmental reporting into broader sustainability reporting, for example see: http://www.environmentalleader.com/2013/07/16/greenbox-develops-turbotax-for-sustainability-reporting .

same facilities will have to interact with, it only makes sense to collaborate on a common service model. Ideally, the collaboration framework proposed in the Blueprint will enable states and EPA to provide a more seamless business interface to our shared customers—for example, avoiding the need for our regulated users to learn two or more different electronic signature systems.

These same considerations also apply to the opportunities presented by improved coordination and collaboration on business process improvements. Given the similarities and dependencies between EPA and state programs, we should be able to, with a small increment of effort, create transferable solutions, and achieve significant returns. The Blueprint identifies specific approaches to supporting this collaboration.

These drivers are motivating agencies to seek transformational changes in the way they do business. E-Enterprise is designed to encourage, enable and accelerate these changes.

Section 3: E-Enterprise Design and Operating Principles

The Working Group established a set of design and operating principles to use during Blueprint development. These principles are a mix of assertions about the operation of E-Enterprise and the expectations for partners (operating principles); and assumptions regarding expected and desired system capabilities (design principles). During Blueprint development, the Blueprint team refined and expanded the principles, and in some instances created analogous components. This section lists the principles (text in italics) and provides additional context about how and where the Blueprint team incorporated them into the Blueprint.

Principle #1: Partnership of Environmental Government Regulators

The E-Enterprise vision is achieved through a collaborative partnership committed to improvement and streamlining of business transactions and the application of advanced information and monitoring technologies. These design and operating principles and a state and EPA joint governance body, the E-Enterprise Leadership Council (EELC), will guide this partnership. States and EPA will work together to develop funding mechanisms and inform the independent resource (including state and tribal assistance and other grants) investment decisions of partners.

Principle #2: Honoring Delegated Authorities

State participation in E-Enterprise activities or use of EPA-provided technical infrastructure will not change existing delegated authorities or other environmental program jurisdictions. However; all environmental programs evolve over time due to statutory, regulatory or implementation procedure changes; delegated authorities have been, and will continue to be, routinely reviewed and updated as needed to respond to these changes.

This principle reinforces the expectation that, by itself, state participation in E-Enterprise activities or use of EPA-provided technology infrastructure does not constitute an agreement by states to changes in established program delegations and MOUs. If seizing improvement opportunities calls for changes in delegations or authorized programs, negotiate these changes through existing channels.

Principle #3: Modernize and Improve Environmental Regulations and Programs, and their Implementation

Achieving the full benefits of E-Enterprise will require drafting new or making changes to existing regulations, policies, business processes, and joint operating agreements. These changes will be informed by E-Enterprise business cases analyses which will identify opportunities for business process integration, alignment, and improvement (e.g., reducing redundancy).

E-Enterprise will seek programmatic changes to improve efficiency and performance, including the exploration and implementation of new management approaches, even where these changes are difficult or controversial—for example, because they propose modification of longstanding program policies or business practices. However, E-Enterprise is not intended to change basic principles of delegate authority with respect to the role of states in administering federal environmental laws.

Principle #4: Joint Governance Prioritizing Activities

The EELC will recommend to EPA and states the inclusion, priority, and phasing of E-Enterprise projects of joint interest. The EELC will establish a standard methodology for business case analyses and use the results to inform their decisions[5]*. Priority and phasing decisions will rely in part on the return on investment demonstrated by the projects, and by the extent to which project documentation shows that projects:*

A. *Improve program efficiency and effectiveness, reduce burden, and improve access to public information access*
B. *Consider resource availability and system readiness*
C. *Further E-Enterprise priorities, including:*
    - *Use of advanced monitoring tools and technologies and data collection and analysis techniques*
    - *Accommodate existing partner systems with minimal disruption*
    - *Provide opportunities for broad adoption beyond the initial participants*
    - *Provide cross-program or cross-media applications, systems, or changes in operation*
    - *Document targeted environmental quality endpoints*

Within the context of an overall E-Enterprise business case analysis, this principle anticipates the use of a return-on-investment (ROI) to assist the EELC in implementation decisions. The business case information and methods will also enable the measurement of progress and inform ongoing management of the initiative. A core responsibility of the EELC will be ensuring a reasonable, consistent use of business case templates, data, and methods that are generally consistent with EPA's and states' current regulatory analysis approaches. EPA is currently developing a framework for analyzing the business case for each E-Enterprise proposal for funding. The business case will consider the return on investment for each project as well as broader benefits and impacts. This will enable decision makers to have a consistent set of criteria to apply when evaluating the value of a particular project in advancing the vision and objectives of E-Enterprise.

[5] Given the very long lead times for some regulatory changes, EPA may need to initiate the rules change prior to the completion of a business case analysis. This phasing does not supersede the prerogative of the EELC to request such a business case and based on it provide a recommendation on the proposed project.

Principle #5: Emphasizing User Perspective

E-Enterprise will strive to take a user perspective in the development, implementation, and ongoing operation of its components. To the extent possible, the technical components will be based on open standards and designed to minimize the technical requirements for all users.

E-transaction interfaces will be designed from the point of view of the regulated entity. The public portion of the E-Enterprise Portal will seek to identify and combine new sources of contextual information to improve the public's user experience and improve transparency. System owners will utilize current technologies to collect ongoing user feedback and to provide excellent customer service.

Principle #6: Creating and Expanding Systems to Improve Two-way Business Transactions

Fully implemented, E-Enterprise seeks to establish a seamless and secure network of services and systems to improve two-way[6] business transactions between the regulated community and environmental government regulators.

Using a combination of the E-Enterprise Portal and web services technology, regulated entities will be provided with options for executing their transactions that best meet their needs. E-Enterprise will also seek to enable a third-party market in e-reporting software to give facilities additional options. Section 4 describes the E-Enterprise Portal and the use of web services in more detail.

Principle #7: Interoperability of Partner Systems and Partner Use of EPA Systems

E-Enterprise is envisioned to evolve the operation of partner's systems toward a set of common functional goals, consistent with their respective needs and ability to implement changes in their systems or approaches. Many partners will continue to operate their own systems. E-Enterprise investments will be designed to be interoperable, to the extent possible, with these systems to provide a seamless user experience. States will evaluate if EPA-provided systems and services can replace separate existing systems, especially as those systems reach the end of their lifecycles. E-Enterprise will also provide a forum through which states and EPA can learn from and potentially adopt proven state solutions.

A goal of E-Enterprise is to provide fiscal and technical resources to support improvement in state e-transaction and transparency systems and to improve the integration of these systems with EPA systems. As described below in Component #6, evolving toward a federated identity system which will allow users to re-use credentials between EPA program applications and state applications is a key example of this integration objective.

Principle #8: Open Data and Web Services

Within the context of existing regulatory or administrative requirements for data quality, timeliness, confidentiality, and security, E-Enterprise will seek to support open data—public data made available in a machine-readable format, including web services, with the objective of making re-use of data as easy and well-informed as possible. E-Enterprise systems and business processes will also respect data ownership as data flows into and is moved between systems.

[6] Two-way business transactions flow information between two entities in both directions. For example, permit application information flows from a facility to an agency and the issued permit information flows from the agency to the facility.

Open Data and Web Services is an E-Enterprise component. See Section 4 of this document for additional information.

Principle #9: Advanced Monitoring Technologies and New Data Collection and Analysis Techniques

E-Enterprise includes a joint commitment to identify opportunities for the application of advanced monitoring tools and technologies and new data collection and analysis techniques (e.g., crowdsourcing) in business process improvements. States and EPA will partner to develop practical resources designed to reduce technical and programmatic implementation costs of selected technologies and speed their deployment and integration into program operations.

The development of the portfolio of advanced monitoring tools and technology solutions is an E-Enterprise component. See Section 4 of this document for additional information.

Principle #10: Shared Technical and Programmatic Infrastructure

E-Enterprise projects will be supported by a shared technical and programmatic infrastructure. EPA is prepared to operate and provide support for the majority of the technical infrastructure. The EELC will seek to develop support for program modernization, streamlining and new approach development. Wherever possible, E-Enterprise will build on the institutional and technical infrastructure of the Exchange Network.

E-Enterprise Shared Technical and Programmatic Infrastructure is an E-Enterprise component. See Section 4 of this document for more information.

Section 4: E-Enterprise Logic Model and Components

This section describes the E-Enterprise logic model and the individual components of E-Enterprise. The logic model provides the context for how these components operate together to achieve the goals of E-Enterprise.

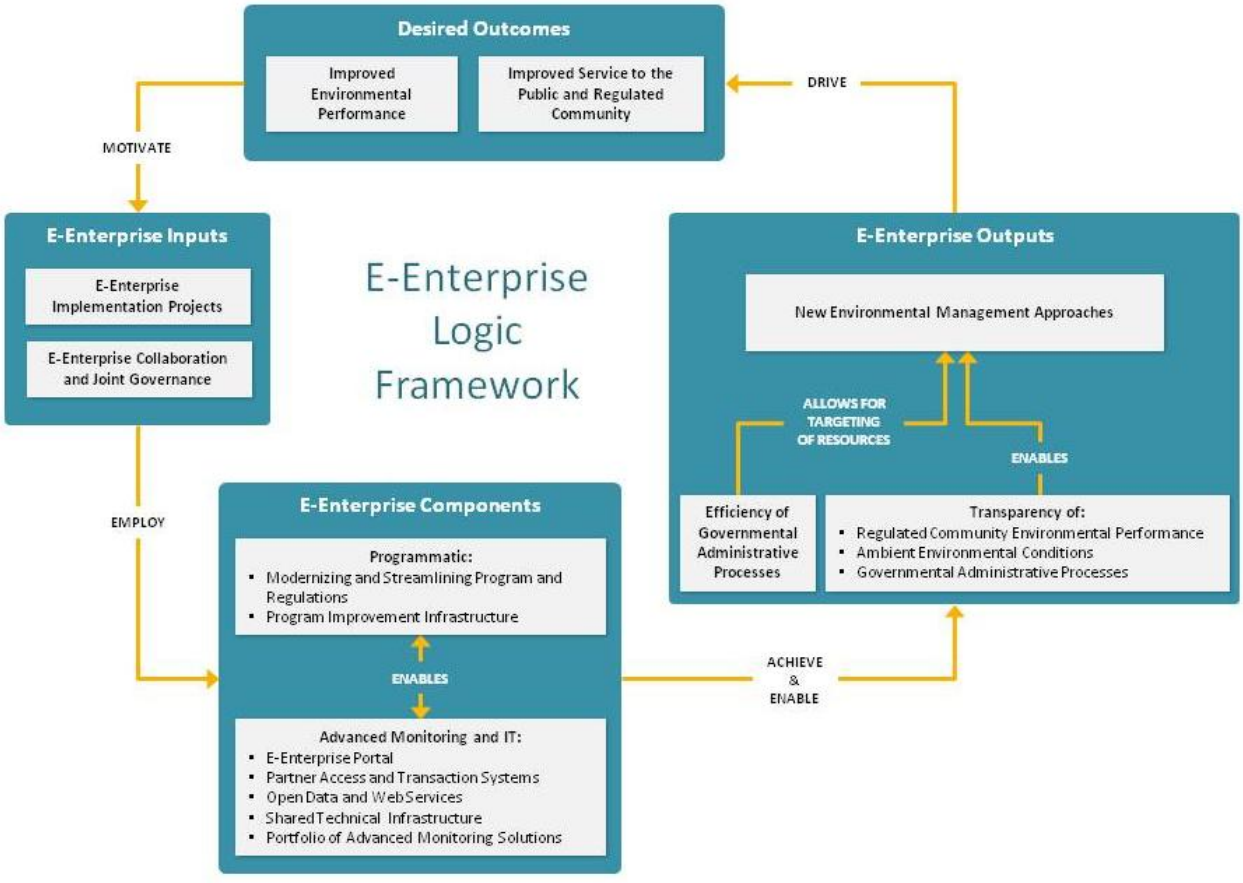
E-Enterprise Logic Model

Starting at the top of the diagram and moving counter-clockwise, are the two primary drivers of E-Enterprise: the demand for improved services to the regulated community and the public, and the objective of improved environmental performance. These drivers motivate individual E-Enterprise implementation projects, overseen by E-Enterprise governance. E-Enterprise implementation projects will employ common E-Enterprise components and the two types of components enable each other. By using the components, implementation projects will achieve greater transparency and improved efficiency of governmental processes. These two outputs enable partners to apply new environmental management approaches. Taken together, transparency, efficiency and new approaches, will drive the desired outcomes of improved environmental performance and service.

A hypothetical example illustrates the operation of this framework. Suppose we seek to improve the environmental performance of a facility by reducing its emissions while at the same time reducing that

facility's reporting burden and providing the public improved information about its performance. The state environmental agency has recently implemented two E-Enterprise implementation projects, a sophisticated tablet-based inspection tool and protocol, and an electronic reporting system for facility emissions. These projects reduce burden respectively on the reporting facility and on the inspectors, freeing up their time to complete other work. Using the improved data provided by these two systems, and the increased inspector availability, the state agency identifies that this facility is a candidate for a new fence line continuous monitoring sensor system and an associated disclosure process. Data from this system is displayed in real time on a public website, and stored for automated reporting, trending, and exceptions monitoring. After this system has demonstrated its efficacy, the state environmental agency negotiates a new permit with the facility which incorporates this system and in return provides the facility with increased internal operational flexibility.

Figure 2: E-Enterprise Logic Framework



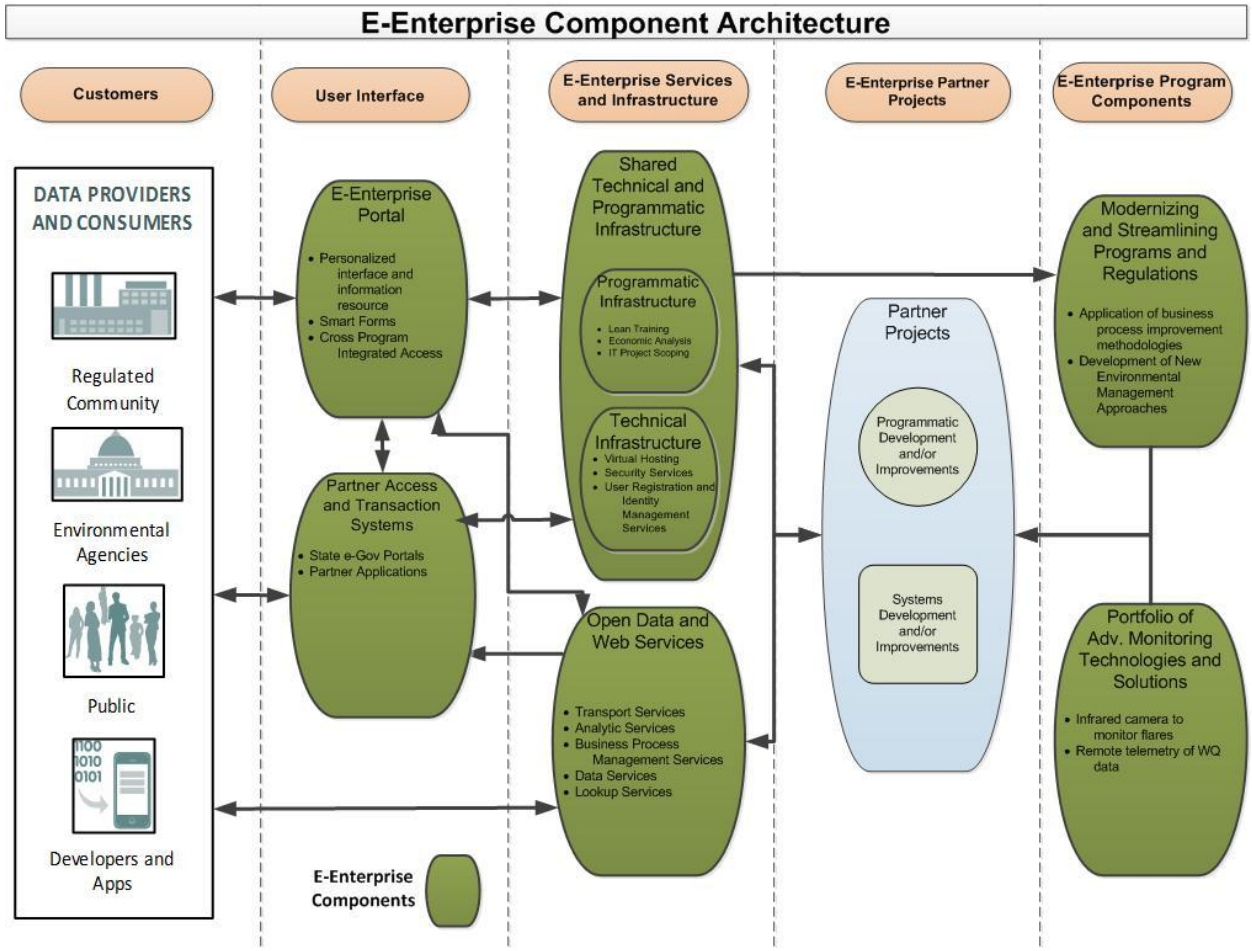
E-Enterprise Components

This subsection describes the six components of E-Enterprise in greater detail. These components, along with the governance structure overseeing their implementation through individual implementation projects, comprise E-Enterprise.

Figure 3 below is a graphic depiction of the E-Enterprise component architecture illustrating the components and their relationships. In summary:

- The first E-Enterprise component is **Modernized and Streamlined Programs and Regulations**. This component has the goal of improving the performance and efficiency of existing programs while at the same time exploring and implementing new environmental management approaches.
- The second component is **Advanced Monitoring Technologies and Data Analysis and Collection Techniques.** The advanced monitoring component will provide new data sources and improved transparency on pollution sources, environmental conditions, and regulated entity performance.
- The third and fourth components ("User Interface"), **E-Enterprise Portal** and **Partner Access and Transaction Systems,** provide improved and coordinated human interfaces to our e-transaction systems.
- The fifth component, complementing the human-oriented user interface components, is the machine-oriented **E-Enterprise Open Data and Web Services**. These services enable developers to build applications providing additional transparency and functionality.
- The sixth component, **Shared Technical and Programmatic Improvement Infrastructure,** supports all components and provides economies of scale through re-use of technology and program improvements approaches.

Figure 3: E-Enterprise Component Architecture



Each of the components is described in greater detail below.

Component #1: Modernizing and Streamlining Programs and Regulations

E-Enterprise implementation projects will require changes to the underlying programs and regulations. This component defines the types and levels of these changes, and how they will impact the spectrum of environmental business processes. This component also codifies the state and EPA commitment to go beyond "paving the cow path" (Principle #3) by explicitly calling for, prior to automation, the evaluation of existing programs for opportunities to modernize, streamline and otherwise improve management processes, including those which support the goal of increased transparency. E-Enterprise distinguishes between program reforms (i.e., improvements to existing programs) and new management approaches (i.e., new types of activities). It also assumes that both types of changes could be made on their own or be enabled by advanced information technology and monitoring, particularly when these changes are designed not in the age of paper but in anticipation of what a digital future could look like and the opportunities it could provide.

Changing how programs operate may require changes to the relationships between EPA and states, as well as changes in the approaches used to influence the regulated community. This makes E-Enterprise more than just a collection of technology projects. Changing technologies and regulations is hard but changing program operations and relationships will be harder. Given current resources, many programs will be stretched to consider even basic automation of existing projects, let alone undertaking major program reform. This indicates that the availability of dedicated resources targeted at priority reform projects, will be essential for E-Enterprise success. This may be the most ambitious and challenging component of E-Enterprise to implement. As discussed in Component #6, the EELC will act as a forum where these changes are deliberated.

Types of Potential Programmatic, Policy, and Regulatory Changes

In order to better characterize program and policy changes, the Blueprint identifies five types or levels of changes. One project may include changes at several levels. These levels are:

Policy and regulatory changes at the EPA (and in some cases state) agency level: These are changes that impact the agency as a whole. EPA agency-level regulations and policies include the CROMERR regulation and its implementing policies,[7] or EPA's September 2013 Policy Statement on E-Reporting. They also include the CPIC investment planning process and the regulatory action development process. It is also possible that changes proposed by a significant program process modernization effort will identify other agency-level regulatory or policy barriers, which will require changes. Such projects might also identify state agency-level policy changes; for example, a change in a state's electronic signature policy to allow that state to enter into a federated identity relationship with EPA.

1. **Changes that impact multiple EPA/state program areas:** Several early proposed E-Enterprise projects propose to integrate reporting processes across program areas; we expect programs and states to propose more such projects in the future. These projects will require regulatory and programmatic changes to multiple programs at once.
2. **Changes to a single EPA/state program area**: These are changes which impact only one program area; however this would include projects which require changes of both federal and state business processes.
3. **Changes to EPA protocols, approved methods, standards or other technical specifications within one program area**: These changes may be necessary to support the implementation of new monitoring technologies, or new environmental management approaches which have technical components.
4. **Changes to State EPA framework agreements or MOUs necessary to implement E-Enterprise driven workflow, program, or procedural changes:** These could include changes to operating agreements, MOUs, and potentially delegation agreements. They would manage the general issues raised by such changes with consideration of Principle #2 "Preserving Delegated Authorities".

[7] Example: current EPA internal policy allows each program office to establish their own electronic signature agreements, specific to their individual program transactions (over 50). This policy may need to be reconsidered if signature agreements are to be reused across program or states.

Many of even the simplest implementation projects will require rule changes. EPA is bound by a strict administrative procedure for the development of rule changes, and an early task of the EELC is to identify how they can provide EPA high quality, early input on these changes. This is especially important in situations in which changes may impact state program operations or the state/EPA relationship.

State/EPA Business Process Relationships and Potential Program/Policy Changes

As a final perspective on potential program and policy changes made as part of E-Enterprise projects, we identify the following types of program authorization and reporting patterns and our expectations for how E-Enterprise will manage changes to them.

1. **EPA-Only Programs:** Federal, non-delegated programs, such as TSCA or FIFRA, where reporters report directly to EPA. EPA would conduct program reviews with input from states as needed via the EELC.
2. **Parallel/Overlapping EPA and State Programs:** This includes programs such as TRI in which reporters are required to report the same information to both EPA and states. The Exchange Network TRI flow enables facilities to simultaneously report to both EPA and states by routing a copy of the submitted data directly to the state Exchange Network node. The EELC secretariat would encourage project proposals in which EPA and states could identify opportunities to optimize these types of parallel reporting programs.
3. **Federal Programs Delegated to States**: Reporters may report directly to states or to an EPA-hosted system which would enable later data access by the state. State and EPA business processes for many of these programs are intertwined. State/EPA teams would conduct these program reviews.
4. **State-Only Programs**: Here reporters report directly to the state, or via an EPA-hosted application. In some cases these programs operate as extensions of federally-delegated programs, for example covering above-ground storage tanks in addition to the federal universe of underground tanks. Program reviews conducted here would be of primary interest to other states, but also to EPA, which uses the same program infrastructure to manage both the federal and state universe.

Example Change Candidate: Facility Information and a Facility Registration Rule

One example of potentially far-reaching policy, program, and process changes at multiple levels is the management of facility identification data. Facility identity is a central concept of E-Enterprise and is closely related to the concept of federated identity. It is also very complex and dynamic. To show a facility "all its stuff in one place", offer the ability to use one login across programs or portals, or paint an “enterprise” or “corporate” picture of environmental performance, we need to know which facility is which and who is who. Until now, most programs (at states and EPA) could operate with their own facility information. In many cases, programs cannot change facility data except through a very program-specific process, even when updated data are available from another source. This has been a challenge for many years. States and EPA have, for the most part, taken an approach of back-end reconciliation through which facility linkages are established post-facto. Some state systems go further and work much harder up front to establish a single facility identity, and to ensure that they are not

creating a duplicate facility record when facilities create new permits or other interests. EPA has continued to hone its facility-matching protocols and explore and evaluate additional sources of facility data. Over the past 20 years EPA has periodically considered a facility registration rule. Perspectives on the facility registration rule itself and its ability to completely resolve these problems vary. The EELC may wish to consider forming a group to fully scope and evaluate this.

The Blueprint recognizes that many programmatic changes will take significant time and resources; this long-term perspective is built into the E-Enterprise vision. Where resources are available, EPA may, through a grant program, support some of the required regulatory and programmatic changes needed to bring state operations into alignment with the solutions developed by E-Enterprise projects. The rationale for managing these changes under E-Enterprise is that together, states and EPA can move forward more effectively as one enterprise by coordinating investments, implementing joint program improvements and technologies, and achieving the resulting economies of scale.

Example: Streamlining and Modernizing Business Processes in Connecticut

The Connecticut Department of Energy and Environmental Protection (CT DEEP) recently completed a Lean driven process to review their storage tank facilities enforcement program. The Storage Tank and PCB Enforcement Unit is responsible for the inspection of 4,000 facilities at least once every three years to ensure compliance with state and federal regulations. The unit works to return facilities in violation back to compliance and improve overall compliance rates across the state. Using Lean methodologies, the state constructed a value stream map of the underground storage tank inspection process including pre-inspection preparations, on-site inspection methods, and post-inspection follow-up. They also identified wastes and non-value-added activities and established baseline measures for the inspection process. These reviews were conducted to eliminate waste and non-value-added steps in the inspection process, produce standard operating procedures documenting process changes, and reduce reliance on seasonal staff and partial inspections.

The key performance indicators were:

- Increase the average number of inspections performed by permanent staff by 20%
- Reduce time needed in the office for pre- and post-inspection work to one day per week
- Reduce the time to issue notice of violation by 40%

After completing the program review, staff reduced the number of steps in the pre-inspection, inspection, and post-inspection processes by more than half (118 steps to 47 steps). Streamlining efforts included using tablets, eliminating the need for inspectors to be in the office. Tablets also provide staff a tool to look up files while in the field, complete their inspection checklist and narrative report, collect signatures, and issue the report (and potential notice of violation) immediately after the inspection while still in the field. This has allowed inspectors to drastically cut the amount of time spent in the office (and decreased associated travel time) while maintaining the ability to interact with the office remotely. It also allows access to a facility information in real-time. The program has not only increased efficiency but also improved environmental outcomes as the number of violations detected increased from 14 per year pre-Lean to 266 violations per year. At the same time, compliance rates for facilities

> also increased by 20%. Staff attributes this success to both the business process improvements implemented and the use of field technology.

Component #2: Portfolio of Advanced Monitoring Technologies and New Data Analysis and Collection Techniques

This E-Enterprise component will establish a portfolio of ready-to-implement advanced monitoring and data collection and analysis solutions, and promote the adoption of these solutions under a model of "build once use many times." This component also includes an ongoing program to develop new solutions for advanced monitoring technologies and new data collection and analysis techniques. The three aspects of this component are inter-related: new monitoring technologies (e.g., a new sensor) will enable new data collection techniques and these collection techniques will in turn produce (often large) sets of data which will require new analysis techniques to interpret, communicate, and use the data. If successful, states and EPA will routinely build these technologies into our programs and use them to achieve improved environmental performance. At that point, they will no longer be considered "advanced."

Note that the goal of E-Enterprise is the adoption of proven technologies; while E-Enterprise may support the pilot integration of technologies/techniques into programs, it not a research and development program.

Our optimism about this component is based on the progress innovators are making in these technologies. Today sensors can detect more substances, be built smaller and cheaper, and respond faster. These emerging capabilities enable powerful synergies between the advanced monitoring component and other E-Enterprise components, especially the E-Enterprise Portal (Component #3) and Open Data and Web Services component (Component #5). For example, a monitor connected to a smartphone could use a web service to upload data; that same application might use the mobile interface of the E-Enterprise Portal, or another data publishing web service, to access reference information on the substances detected or to access data others have monitored nearby.

A sampling of advanced monitoring technologies includes:[8]

- Ultraviolet-visible (UV-VIS) spectroscopy, pH, and air quality sensors for mobile devices
- Real-time monitoring for Cyanobacteria in water bodies
- Passive Fourier Transform Infrared (PFTIR) to measure flare combustion efficiency and characterize other volatile organic compound (VOCs) sources
- Real time telemetry of continuous water quality monitoring
- Portable sensors for VOCs in soil

[8] See http://www.electrochem.org/dl/interface/wtr/wtr10/wtr10_p035-040.pdf for a good review. For information on EPA's Next Generation Air Monitoring projects, see http://www.epa.gov/airscience/air-sensor-research.htm.

Identifying and Promoting New Monitoring Technologies

E-Enterprise will use existing research development and validation efforts to identify candidate technologies for promotion. Candidate technologies should be ready to pilot. The EELC will also seek to inform existing research and development efforts by providing a forum for joint discussion of pressing business needs and technology development needs and opportunities.

EPA and states have gained experience with specific ready-at-hand technologies and the results have been significant.[9] With new technology, previously invisible and unknown emissions can become visible and measurable. In addition to their use by regulatory agencies, the use and promotion of these advanced monitoring technologies may encourage their broader adoption by facilities, and in doing so reduce their cost. It may be possible for government to support a more active marketplace for monitoring technologies by being more aggressive in exploiting and communicating about their capabilities. In partnership with EPA's ORD, E-Enterprise could also consider sponsorship of contests or other events to raise the visibility of candidate technologies.

The EELC will identify candidate technologies either through the recommendations of its standing advisory body (see next steps) or via E-Enterprise project proposals that incorporate a new technology. Partners would develop new technology proposals in response to a general E-Enterprise solicitation or in response to a solicitation targeted at a specific new technology. Once the EELC has accepted an advisory body recommendation for a technology for promotion the standing advisory body could initiate efforts to:

- Provide basic documentation and outreach to promote awareness techniques;
- Develop training programs for staff to incorporate these technologies into program management; and
- Find, develop, and share best practices and examples of how agencies can use these technologies in program operation, including incorporation in permits or consent decrees.

These efforts would have the goal of producing a packaged "solution" ready for implementation by others.

New Monitoring Technology Data Collection Approaches and Techniques

In addition to their deployment by agency staff or facilities to monitor sources directly, the new generation of sensors enables new data collection techniques and approaches. These include the ability to expand the "where" and "who" of monitoring by employing sensors much more broadly (for example at facility fence lines or in sensitive areas) and empowering "citizen science" through which the public collects data. Powerful new collection techniques go beyond those based on sophisticated sensors; in some cases (such as invasive species) a location-stamped photo is enough. These are not new ideas, but

[9] EPA has used Passive Fourier Transform Infrared cameras to test flares to determine combustion efficiency. EPA found many flares had poor combustion efficiency and emitted substantial amounts of Volatile Organic Compounds (VOCs). In two recent U.S. EPA Clean Air Act consent decrees facilities assumed 98% flare combustion efficiency (meaning they would be in compliance) using emission factors to report low VOC emissions. However, when EPA checked their actual flare performance, emissions detected were far higher (i.e., there was lower actual combustion efficiency). This means that communities were exposed to far more hazardous air pollutants than EPA and the facility had assumed.

this generation of sensors and our ability to network them via the Internet represents a transformational expansion of the opportunities they present. These solutions would complement the portfolio of demonstrated technologies with a portfolio of demonstrated data collection and utilization solutions. As with monitoring technologies, the goal here is to "develop once, use many times." E-Enterprise could support projects, including those involving 3rd parties, to prove-out new collection methods and develop the documentation and training needed to produce ready-to-implement solutions. E-Enterprise would then support the adoption of these solutions.

Analysis and Visualization Techniques to Analyze Data So They Can Be Communicated and Used In Program Operations

The final aspect of Component #2 consists of the advanced analysis solutions needed to routinely transform data from new sensors and new collection techniques into usable information. In many cases, using these data will present new technical and programmatic challenges given the data's size and complexity. For example, a mesh of networked mobile ambient air monitors may provide thousands or millions of data points per year. These data may have lower precision and accuracy than existing standard methods. How can analysts effectively summarize these data for use?

As with monitoring technologies and data collection techniques, E-Enterprise will develop ready-to-implement solutions suitable for use by a variety of users. In many cases it may be possible to go beyond just providing documentation about these analytic techniques, instead developing cloud-based analysis and management tools for partners and their applications to use. This may include GIS services as well as statistical tools and methods for handling the "big data" aspects of these sources. These tools would be developed and deployed as part of individual E-Enterprise implementation projects and/or as part of the Shared Technical Infrastructure (Component #6) and Open Data and Web Services Component (Component #5). This would enable partners and third parties to use the processing power of cloud-hosted services to create customized interfaces targeted for specific users. E-Enterprise will use currently ongoing work at EPA's ORD to provide training and documentation on these methods.

Component #3: E-Enterprise Portal

The E-Enterprise Portal (the Portal) will provide an enterprise-level customized view, to the regulated community and the public, of many EPA and state web resources. The E-Enterprise Portal is a central component of the E-Enterprise vision, a key piece of EPA infrastructure, and an integration point for many other components. The Portal will include a user-driven customizable view integrated across EPA programs and geographies, streamlined two-way electronic transactions for the regulated community, and will support improved public access by providing new tools to manage information sources and interact with government. For all users, the Portal will also integrate information access across partners, to provide as seamless an experience as possible to users moving in either direction between the E-Enterprise Portal and partner portals or applications.

Background: E-Commerce Portals and their Application to E-Enterprise

The functionality of the E-Enterprise Portal is informed by the compelling user experiences of the best e-commerce sites. Functionality that the E-Enterprise Portal can borrow from these sites includes:

- A customized interface based on a user profile that includes as many relevant parameters (such as location, interests, permits, industry types) as practical.
- Topical and task-oriented navigation divorced from the particular organizational structures of our agencies.
- Searchability, using a broad range of characteristics such as location, facility, substance or regulation.
- Drill-through from summary analyses to the underlying information and metadata.
- Accessibility using nearly any browser or mobile device.
- Improved interaction with the agency using email or chat.
- Connections to social media.
- Options to subscribe to "alerts" that could provide pertinent information or be triggered by certain events such as a new draft regulation in an area of interest or a regulatory report coming due.
- An expert interface for sophisticated users.
- Tracking and viewing of transaction history to provide suggestions to users for potential content of interest.
- A history of previous searches used to provide new suggested resources.
- User ratings or reviews of resources.
- Allowing users to build a collection of favorite resources.

A main purpose of the Portal is to provide better customer service by taking a user-centric perspective, and using that perspective to shape the user experience across our diverse transaction systems and information sources. Under this component, E-Enterprise will consolidate investments in improved user interfaces into this integrated framework. This does not mean that there will be only one interface for all EPA applications; rather, that the current universe of program- and functionally-oriented interfaces would, over time, be integrated into the Portal so that users can be more efficiently delivered to the interface that best meets their needs, initially on signing in, and on subsequent visits.

Given the large scope of the Portal, implementation will be incremental. Before developing an implementation strategy for the Portal, EPA, with ECOS and other users, will conduct outreach and analysis to estimate the relative value and cost of potential functionalities for key audiences including consideration of interoperability with state systems. Further, the Blueprint calls for development of the "Portal Concept of Operations," a document that will include the initial analysis on the value and cost of potential functionalities, identify first generation functionality, and describe how existing and new interfaces will integrate with the Portal. Depending on the results of this more detailed requirements analysis; EPA may implement the Portal as one or two portals. If two portals are to be built, one would be for the public and one for the regulated community. For the purposes of this discussion, we will refer to the two portals separately.

E-Enterprise Portal Functionality for Regulated Entities

For regulated entities, the design focus for the Portal will be on making interactions with government as efficient and effective as possible. This means E-Enterprise must reduce the key sources of burden in data reporting. These include the effort expended by reporters to:

- Understand which reporting requirements are applicable in a user's situation (this includes reports that are currently due and those that will be due in the near future).
- Understand, at the report level, the information required.
- Interpret individual form cells or fields, and find the help and reference information required to interpret what is being asked for.
- Convert data from the local format to the format required by the report and enter/upload it.
- Identify errors or omissions in the entered information.
- Transmit the data to EPA or other partner.
- Track the status of transactions and respond as needed.

As partners integrate existing transaction system interfaces with the Portal, the interfaces will be converted to provide "smart form" functionality similar to that provided in leading income tax preparation applications. These forms lead users through a step-by-step process, asking simple questions, and providing relevant help in context, to make entry of the required information as easy and accurate as possible. Customization based on user profiles may support the development of specialized versions of these forms particular to a limited class or sector of users. The EPA/ECOS whitepaper, *Preparing for a New Future: States & EPA Using Modern Technology to Deliver Better Environmental Results*,[10] identified additional target functionality including submitting required reports and permit applications, paying permit and other fees electronically, requesting permit status information online, and the ability to modify facility information once and have the changes applied to all applicable programs.

Some state-of-the-art e-transaction portals administered by states support these functions now and the E-Enterprise Portal would seek to provide them for as many programs and partners as possible. For users regulated by more than one program and jurisdiction, these functions could cross both program and agency boundaries.

The Portal will also reduce burden by helping guide reporters in understanding their reporting obligations and then guide them through the reporting process. This would include the ability to carry forward basic facility information between forms, and the ability to manage all open transactions from one common screen. As described above, the Blueprint Team recommends that the EELC commission outreach and analysis of these opportunities to identify those of greatest value to our customers. This should include an options analysis for the feasibility and value of integrating transactions across regulatory programs and jurisdictions. It may turn out that the complexity of providing more advanced

[10] ECOS Annual Meeting Discussion Draft August 19, 2012. Preparing for a New Future: States & EPA Using Modern Technology to Deliver Better Environmental Results. Draft Paper Prepared by the ECOS-EPA Working Group For Discussion at ECOS Annual Meeting on August 27, 2012.

forms of interoperability does not provide a sufficient burden reduction ROI, and that other Portal or smart form functionalities, perhaps some as yet unidentified, could provide a higher ROI.

In addition to streamlining inbound transactions, the regulated community Portal will access the user profile to provide users with tailored information, provided via web services, from existing EPA and state information resources including:

- An integrated, comprehensive listing of "everything we know" about that facility and its interactions with environmental regulators, including state and local permits and authorizations.
- Transaction-oriented information such as the status of previous submissions, when a future report is due, or flagging of changes in reporting requirements.
- Regulatory or programmatic developments that may be of interest.
- Existing, new, or changed EPA standards and methods.
- Existing or new compliance assistance information.
- Other topical resources from partner websites.

EPA also intends to encourage states to consider use of Portal-hosted applications for the transaction of state business using some form of "self configuration" capability. It intends to provide technical support for state use for applicable transactions; this includes delegated programs, and potentially programs in which EPA collects state-specific information (beyond core federally-required information). In some cases, EPA may consider supporting the use of the E-Enterprise Portal for a state-only data collection. Data collected via the Portal would be available via either "push" or "pull" web services.[11] Component #4 discusses this scenario in more detail.

Options for Integration of E-Enterprise Portal with Partner Portals and Applications

Integration of two applications (state or federal) hosted on the E-Enterprise portal is facilitated by the common portal infrastructure; this is what portals do. This section provides an overview of the options and issues for achieving interoperability *across* partner portals. The functional goal of this interoperability is the efficient movement of either the user or some relevant content, via a hyperlink, from one portal to the other to help the user accomplish some task. The portals will achieve this functionality using behind the scenes web services (for federated identity or data pull/push), so it is actually the web services that are interoperable.

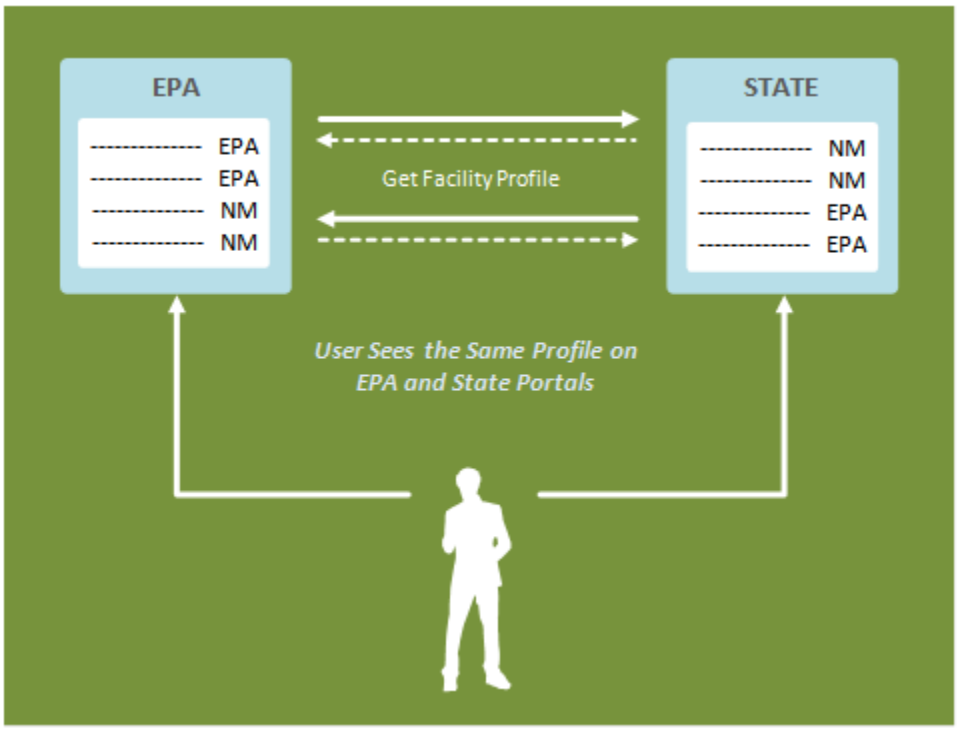
Wherever possible, portal functionality should connect users from an informative departure page to the appropriate landing page on the partner portal for the required transaction (e.g., from an EPA air permitting discussion that references a state, directly to the relevant state e-permitting application landing page). This will require states and EPA to maintain some mechanism to synchronize links between portals.

While simply linking a user to the right landing page will provide some value, many members of the Blueprint team envisioned that more advanced forms of interoperability may be desirable and feasible. These approaches will require states and EPA to establish a way to share the identity of users across

[11] The Portal Concept of Operations document would explore specific scenarios for state use of the E-Enterprise portal.

portals—a concept known as federated identity. Figure 4 and the example use case below illustrate this interoperability.

Figure 4: Portal Interoperability Providing a Seamless User Experience



The Exchange Network has laid the groundwork for much of this functionality. It has also identified the difficulties E-Enterprise is likely to face in what would be a significant extension of current Exchange Network capabilities. The outreach and analysis already described above should include evaluation of the value and the technical and programmatic costs of these possible approaches. This analysis would determine how far we go along this spectrum of interoperability. It may turn out that good links between portals coupled with smarter forms would provide more value to our customers than any form of more sophisticated interoperability; we will not know until we ask.

Example: E-Enterprise Portal Providing a Seamless Cross-program, Multi-functional, Multi-agency User Experience

ACME Inc. is regulated under multiple federal and state regulations; it also has an integrated environmental management system (EMS).[12] An ACME administrator logs into the E-Enterprise Portal, using their ACME's issued standard account name and password and lands on ACME's customized "myEPA" landing page. This page lists all of ACME's current regulatory interactions (such as permits) and is powered via a web "service call" from the E-Enterprise Portal to the

[12] The stipulation that ACME has an integrated EMS means that ACME is a stronger customer for an integrated regulatory interface. Facilities with decentralized environmental management (e.g. different permits/requirements are handled by entirely separate departments and staff) may, at least initially, see less value in an integrated regulatory interface, and resist the overhead of reconciling these relationships with an integrated portal. Alternatively, such an interface could provide disparate individuals in the firm with greater visibility across the firm.

state system, and includes their applicable state statues, including recently-submitted reports, and a list of upcoming required reports sorted by due date. The profile page also lists partially completed reports. The administrator clicks on a draft TRI report for one of its facilities, completes and signs it, enabled by the shared CROMMER service, and is able to submit it simultaneously to EPA and the state. The administrator identifies a state report that is due soon. The administrator clicks on the link and is transferred to the ACME account on the state portal page for that report. Standard facility information required on the state report form is pre-populated. The ACME administrator completes the state report form and gets to a section where she needs to look up reference information. She clicks on the help button for that section and receives tailored context-sensitive information from EPA through the state portal. The ACME administrator also uses the chemical identity lookup function (a web service call from the state portal to the EPA chemical registry) to select a required substance name from the list provided. Once the ACME employee completes the report, she signs and submits the form which is processed on the state portal through a shared CROMERR[13] service. Upon the employee's return to ACME's "myEPA" profile page, the status of both submitted reports is shown as updated. They can then select one permit, and drill down to the inspections conducted under that permit. Drilling down to one inspection report, she continues the process of documenting the company's remedies to the identified deficiencies; once this report is completed it will be submitted via the portal. Staff at ACME can review the list of deficiencies found in the last inspection and provide documentation to the regulatory agency of its progress in remedying the deficiencies.

E-Enterprise Portal Functionality for the Public

Many applications on current state and EPA websites allow users to perform powerful searches within a given domain (e.g., water quality), so that a user can focus in on a topical or geographic area of interest. In many cases, users can bookmark these individual searches, but must manually and individually manage these bookmarks. Users cannot build a durable customized home page which remembers and integrates information on these interests; our shorthand for this proposed new functionality is "myEPA." As in the case of the regulated community, providing "myEPA" functionality is a primary objective of the E-Enterprise public portal. Establishing a user profile is the most important step to unlock the functionality that will provide users with customized content. Users may also customize their view to streamline interactions with EPA (such as comments on a regulation or permit). The content users might choose from for display and access will come for the most part from existing EPA or partner websites and applications. Content examples include:

- Localized information such as ambient environmental conditions, new/modified/renewed permits or authorizations, or local educational and volunteer opportunities.
- Topical information such as new research results, new/revised regulations or program information, or details on specific environmental issues.
- Integration with social media, such as location- or topically-based interest groups.
- Ability to drill through a summary analysis to access the underlying data and metadata.

[13] The Cross-Media Electronic Reporting Regulation program can be found online at: http://www.epa.gov/cromerr/

- Searchability by a broad range of dimensions; for example: location, facility, substance or regulation.
- Topical and task-oriented navigation.
- Option to subscribe to alerts for new information (e.g., a new report or regulation).
- Options for sophisticated clients to bypass the generic user interface and instead to directly to an expert interface.

In addition to providing these capabilities to the public, EPA and states intend to re-evaluate how the application of portal technology can provide opportunities for the integration and consolidation of existing public access tools. Typically, each program office develops public access tools for their individual program areas over time; in a few cases these tools span program areas. Users must find these applications in order to access these data. Portal implementation may provide new options for linking users to these applications and their content.

Mobile and Location-Aware Applications as Dominant User Platforms

Growth in the use of mobile technologies like smart phones and tablets suggests they will soon be *the* dominant way that users access the Internet and run applications. The White House digital government strategy includes this directive: "*Enable the American people and an increasingly mobile workforce to access high-quality digital government information and services anywhere, anytime, on any device.*"[14] This means that the E-Enterprise Portal and partner portals will have to accommodate mobile users. On-the-fly customization of applications for viewing via mobile devices is a key functionality of off-the-shelf portal software. Alternatively, for frequently-used functionality, EPA, partners, or third parties have developed and must continue to develop apps which run locally on the devices and use web services (as described in Component #5), to access and transact (push or pull) data.

In addition to their mobility, mobile devices are increasingly location aware. The embedded GPS creates new capabilities for localizing data access, and geo-stamping data observations and collection. As described in Component #2, mobile devices can also now use sensor technologies; this provides even more opportunities to collect and share data. Examples include:

- Use of tablets loaded with inspector checklists with geolocation and camera capabilities.
- Ambient monitoring data that are geo-stamped based on a user's current position.
- Geographically based information pushes, i.e., educational and informational content on a watershed or other eco-region pushed to the user *as they enter that area*.

Component #4: Partner Access and Transaction Systems

Technology changes in cycles. In the 1970s, most states did not have their own environmental data management systems, and relied on EPA systems where they existed. No environmental agencies had electronic transaction capabilities. In the late 1970s and 1980s, along with EPA, several states were pioneers in developing major environmental information systems, including the first generation of e-

[14] The Whitehouse Digital Strategy is available online at: www.whitehouse.gov/digitalgov/html5

transaction systems. Funding for such systems was eventually supplemented by the One Stop Grant program in the late 1990s to support building state information systems, including e-transaction systems. One Stop's successor, the Exchange Network Grant program, supported states, tribes and territories in system development starting in 2002. State development of their own systems meant that many no longer needed to be direct users of EPA systems; this period saw the rapid growth in the number and diversity of state applications, including e-transaction systems. Two ongoing motivations for state system development have always been: the tailoring of the system to meet state business needs, including fee collection or coverage for "state-only" facilities; and, management of data beyond the "federal core" data reporting requirements for a particular program. The growth in the number of such systems, and the need to effectively share data between them and their national counterparts, was a major motivation for the creation and design of the Exchange Network.

By the late 2000s many states had a significant portfolio of relatively new systems, many with e-transaction functionality, mostly focused on e-Reporting but also including some e-Permitting. However, with the recent recession, state agency budgets have been restricted and, aside from Exchange Network grants, there have been limited new resources for e-transaction systems. The pace of state system development has slowed.

At the same time, cloud computing has matured, and the ability of EPA (or other providers) to provide high quality centrally-hosted applications to meet state needs has increased, while the costs[15] per user has decreased. In some cases, for some programs, EPA systems may now meet all state needs for that program. For example, EPA designed the current drinking water system for states to run as a local application with a proprietary interface to the national system. In contrast, the Safe Drinking Water Information (SDWIS) Next-Gen system, now under development, will be entirely cloud-hosted; all users, labs, drinking water systems and states will be able to use this application from the cloud without a locally-installed application. Of course a small number of states may still choose to continue to develop and use their own local drinking water database.

As states re-evaluate development of new systems or maintenance investments for existing systems they are also assessing the extent to which EPA-hosted applications could meet some or all of their requirements. As state systems reach the end of their lifecycles many states may consider migrating to the use of all, or portions of one or more, EPA-hosted national applications and shared services.

Thus, we expect for the foreseeable future, states will be using a mix of both local state applications and EPA-hosted applications and services. We expect use of the latter to increase slowly over time. States will continue to develop innovative local systems and integrated portals to meet their evolving needs, and in doing so they will continue to act as pathfinders for other states and EPA. The Exchange Network has been, and will continue to provide a mechanism for data exchange between these local or state systems and their national counterparts.

[15] While these costs have lowered, they are not zero. While EPA will seek to provide as many services to as many states as possible, the EPA may need to consider ways to offset some of the incurred costs.

As described in Component #3 (Portal), the guiding principle of E-Enterprise is that its design be customer-centric. This means our integration between the E-Enterprise Portal and state applications/portals must be customer-centric. In situations in which states use EPA-hosted applications, this integration will occur with the portal environment; under circumstances in which states operate their own e-transaction systems, E-enterprise must provide options to link with the E-Enterprise Portal (as described above) and to improve state systems.[16]

Ideally, for states that have outsourced some portions of their operations and IT workload to EPA, these states could focus their innovation efforts on tools to integrate and use, rather than just collect and manage, these data for improved program management. Innovation here could directly support the broader E-Enterprise goal of improved environmental management approaches and performance.

Even with a predicted increase in state use of EPA systems, for the foreseeable future a large portion of all e-transactions in the U.S. will be hosted, in full or in part, by state systems. For many users, the face of E-Enterprise will be these state systems; they will have no requirement or need to interact with EPA. If E-Enterprise is going to work, it has to work with and improve these state systems.

Component #5: E-Enterprise Open Data and Web Services

Over the past 20 years there has been a growing consensus that making government data available in an open (i.e., machine readable) format is vitally important. "Open Data" is the shorthand used to refer to making data available for manual download and re-use by others outside the entity that created the data system. EPA is in the process of developing an open data policy and recently the Obama administration issued an Executive Order—*Making Open and Machine Readable the New Default for Government Information.*[17] As a complement to the ability to manually download data, web services allow computers to efficiently exchange data so that multiple information sources can be integrated into a single interface. This interface may be another computer, or a tablet or Smartphone app. Web services can also expose specific functionality (such as a business process workflow or a scientific model) for re-use. The Exchange Network is based on web services.

Component #5 has two aspects; the first is the network of web services that will connect E-Enterprise applications, and the second is the design principle that all data will be available, with the required level of security, to all authorized or public users both as web services and as downloadable data. This means that data customers will have the option of using an existing interface, such as a state portal or the E-Enterprise Portal, using an interface developed by another partner or third party, or developing their own interface, to access information. One particularly important set of web services will be those that provide states with automated access to data collected via the Portal or other EPA applications. These services allow states to develop their own applications for access and analysis of these data.

[16] This will require a service-oriented architecture with a heavy reliance on web services to provide all partners with the maximum architectural flexibility to pick the approach that works best for them at that time. This flexibility means state system architects will have the option of integrating individual EPA provided services into their portals, as well as the capability to manage linkages between their portal and the E-Enterprise Portal.

[17] Executive Order—Making Open and Machine Readable the New Default for Government Information: http://www.whitehouse.gov/the-press-office/2013/05/09/executive-order-making-open-and-machine-readable-new-default-government-

Where web services are publicly available, they democratize the application development process and enable the growth of a developer community whose members use these services, combined in innovative ways, to create new products. EPA has already established a website to support such a community[18] and conducted a contest in which developers competed to use open data and web services to create innovative applications. These types of contests can provide a breeding ground for innovative concepts and provide a complement, though not a replacement, for traditional agency-supported development efforts.

E-Enterprise will depend on a network of different types of web services. We are not starting from scratch—some of the necessary services are already provided by EPA via the Exchange Network, or via other platforms. Many of these services rely on parts of the E-Enterprise Shared Technical Infrastructure, for example EPA's CDX. This infrastructure is discussed in Component #6, while the services used to access this infrastructure are discussed below.

The Blueprint team identified a large set of possible E-Enterprise web service types. These include:

1. **Access to State Data Collected via EPA**: These services would provide access to data received by EPA from reporters under delegated/authorized programs or state-only programs.
2. **Access to Federally-Reported Data**: These services would provide access to data received by EPA from direct federal reporters; partners could use these services to integrate these data into local applications to provide a more complete picture of a given facility's environmental profile.
3. **Access to Direct State-Reported Data:** These services would provide access, to EPA or other users, to data reported directly to states. EPA could use these services to build a more complete facility profile and/or provide access to detailed reported data.
4. **Cross –Media Electronic Reporting Regulation (CROMERR) web services**: These services provide access to EPA's CDX security functions such as user account management and electronic signature; they allow states to develop their own e-transaction systems but avoid the need to develop (and get approved through the CROMERR approval process) these more complex functionalities.[19]
5. **User Account Management and Data Access for Delegated State Users of EPA-Hosted Applications:** These services would be used by states using EPA-hosted applications (accessed via the E-Enterprise Portal) to manage their reporter user accounts and to access the reported data for local processing and use.
6. **Direct to EPA/State Data Submittal**: These services support states, regulated entities, or third parties (such as software vendors) to directly and automatically submit data to EPA. These services could also be used by major reporters to do direct automated reporting. States could also host such services.
7. **"Lookup" Services Hosted by EPA Registries:** EPA's System of Registries maintains authoritative information about EPA business objects, including identification information about the facilities and substances that EPA regulates and/or in which EPA has an environmental interest. These

[18] EPA Developer Central: http://www.epa.gov/developer/

[19] As discussed above, EPA may still need to consider some form of cost recovery for these and other services. Detailed CROMERR information available at: http://www.epa.gov/cromerr/

registries also provide access to key metadata about EPA systems, and the data element dictionaries and code sets within them. The registries map system data elements to data standards, identifying the extent to which interoperability and the potential for integration or streamlining exists. The registries also provide access to shared IT assets (e.g., schema, code sets, templates, etc.) which can be reused in system development. This access to registered, high quality authoritative content will be essential to E-Enterprise.

8. **Topical content services:** As described in the content syndication (sharing) section below, these services could provide topical content, including reference information, compliance assistance information, or permitting support information as service for integration into partner applications. As described below there are now various technologies to manage and distribute this type of content.[20]
9. **Portal Interoperability Services:** These are services that support the ability to browse between the E-Enterprise Portal and partner portals by exchanging "key" linking information. This would allow a user to see all their information in one place on either portal and to follow links to the appropriate portal for more information or to complete a transaction.[21]
10. **Geographic Services**: These services provide access to geographically-referenced maps, data, and services. Here, the "key" information is location; users can query and integrate these services via a shared locational reference.
11. **Document and Other Unstructured Data Services**: These services would provide reporters, states and EPA the ability to post, share and process document-based information. This could include, for example permit applications, approved permits, narrative reports, or environmental assessments. Where applicable, states and EPA could integrate these services with their content management systems or link them to related structured data transactions.
12. **Workflow Support Services**: Just as the CROMERR security services support specific e-transaction workflow steps (e.g., the signing ceremony), there may be other services (such as PDF generation or camera image processing) made available centrally to lower the costs of automating program processes such as generating an inspection report.

These services (some of which already exist) would be implemented incrementally via E-Enterprise implementation projects. Once established, other projects could re-use the services. For example, an E-Enterprise grant program could provide assistance to states to either host or use such services. Because the services would be common across users, any applications developed by one state could be immediately used by EPA or any other state. To further support an active developer community for these services, EPA could host a developer's advisory committee to advise EELC and the Exchange Network Leadership Council.

Example: Federal Register 2.0

> A Federal Register 2.0 concept was developed during Blueprint team deliberations. The idea is that as rules are developed, alongside the usual textual narrative, there would be an analogous

[20] These technologies include HTTP-based web services, RSS, and RDF.

[21] As these systems move more data back and forth between state and EPA portals, those systems will need to make the sources and provenance of the data transparent to the end user.

> model developed to express the rule's key concepts and relationships in a machine-readable format. This format would make supporting IT system development more efficient and could enable more third party e-transaction software by avoiding the "archeology" needed to extract business rules from the complex and difficult to read regulatory language. This concept is related to preliminary work at EPA to develop a regulatory "look up" service based on a registry of regulatory information and other research.[22]

Open Data and Web Services and the E-Enterprise and State Portals.

There is a natural tension between the concept of wanting there to be "one interface to rule them all," in the form of a single agency website or portal, and the concept of Open Data and Web Services. Open Data and Web Services are based on the supposition that, while a user should always be able to find official information sources when they need them, the more outlets for environmental data we have, the better. The best example of this may be the National Weather Service: when that agency began to release data in an open format, there was a sudden creation of third-party weather data applications. Nobody complains that there are too many sources of weather data, and everybody knows where to go to get the official data. This implies a two-pronged strategy. EPA and states should invest in making their respective portals as useful as possible, especially in terms of providing the "one stop" from which most users can be connected with the right information or service. At the same time, EPA and states should invest in making data available as per the Open Data and Web Services component (Component #5) to enable the development of a diversity of customized interfaces. As developers create these interfaces and they are proven out, they can be linked to via the portals, completing the circle.

Improving Transparency by Improving Context through Content Syndication

One mechanism for providing richer context alongside data is content syndication. Content syndication treats all information as data services. The White House's Digital Government Strategy specifically emphasized content syndication as a desirable strategy:

> *[Pursue] An "Information-Centric" approach—which moves us from managing "documents" to managing discrete pieces of open data and content which can be tagged, shared, secured, mashed up and presented in the way that is most useful for the consumer of that information.*

Consider that the EPA website contains a wealth of content on compliance assistance related to specific industrial processes; most of this information is trapped on specific web pages. With some modest technical changes, EPA may be able to manage this content as data, and serve it up upon request—for example by a specific industrial process for integration into other web pages or applications. Other examples are the lookup services supported by EPA's registries, such as the Substance Registry Services which, with a simple query, can serve up rich, detailed information about substances for integration into partner websites. States and EPA can use this approach across many topical domains, especially those

[22] Additional context on the use of Open Data in the construction industry can be found in the document Semantic Web Approach to Ease Regulation Compliance. Available online at: http://www.mdpi.com/1999-5903/4/3/830/pdf.

key to environmental management, such as locations, regulations, and substances. This will improve the context provided alongside the data.[23]

The content syndication concept extends the possible reach of transparency improvement efforts to partner websites as well. EPA could source topical content publication services for use by partners to improve transparency on their sites and EPA may be able to use topical data services published by other partners on its website/portal. Further, these services would enable third parties to develop more informative websites using reliable content from EPA or states.

These content syndication services would also allow Portal (E-Enterprise or state) users to "subscribe" to information sources based on their specific interests such as a given geography or specific designated states in which they have facilities.

Component #6: E-Enterprise Shared Technical and Programmatic Infrastructure

E-Enterprise projects will use a shared technical infrastructure supporting the Portal, Partner Systems, Open Data and Web Services, and Advanced Monitoring components. E-Enterprise projects will also use a program and business process improvement infrastructure, which will provide resources to make program and business process improvement efforts easier and more effective.

E-Enterprise Shared Technical Infrastructure

Infrastructure is any technical asset used by multiple partners to support some aspect of E-Enterprise functionality. There is some overlap between this component and the Open Data and Web Services component (Component #5). The infrastructure component focuses on what technology assets are needed to support implementation projects. The web services component focuses on how partners access these assets through services. E-Enterprise shared infrastructure will also include "soft" assets including an E-Enterprise help desk, a technical developer forum, or training videos for E-Enterprise applications.

EPA is prepared to develop, operate and provide support for the majority of the E-Enterprise shared technical infrastructure. This will be a major commitment for EPA and a key foundation for E-Enterprise. Wherever possible, E-Enterprise will use or adapt the institutional and technical infrastructure of the Exchange Network as it continues to evolve. Development of E-Enterprise shared technical infrastructure will be guided by a high level E-Enterprise solution architecture. Development of this architecture is discussed in the next steps section. The overriding design consideration is ensuring infrastructure is easily reused by multiple projects and partners. An E-Enterprise grant program could support state projects which make use of shared infrastructure, or, which as a derivative product, produce assets that can be incorporated into the shared infrastructure.

Many subcomponents of the shared infrastructure are based on existing resources. These include:

- **EPA's Central Data Exchange (CDX)**: Provides a range of robust electronic reporting and receiving services.

[23] EPA website managers are already implementing and experimenting with these approaches.

- **EPA Identity Store**: Used to manage user accounts. E-Enterprise will use this infrastructure to support state and EPA sharing of identity credentials to allow users to use their username and password across applications and in some cases across partner portals. This would include state portals re-using EPA-issued credentials, and also EPA re-using state-issued credentials. The identity store and its associated applications manage and store these trust relationships.
- **EPA System of Registries:** Provide reference and locator information across a range of topics including facility identification, chemical and biological substance identification, definitions for standard data elements, and elements from data dictionaries, code sets, reusable components, and agency terminology.
- **EPA GeoPlatform:** Provides advanced service-based GIS capabilities for the incorporation of powerful customizable mapping capabilities into applications.

Other infrastructure is still in the exploration and definition phase; their development will depend, in part, on the trajectory of E-Enterprise and the early implementation projects. Additional candidates include:

- **E-Enterprise Portal:** See Component #3.
- **Knowledge modeling tools**: These manage topical content and model complex concepts and relationships. These tools might be used to build applications which provide assistance to facilities in understanding which regulations may apply to them, and where they do apply, to establish which specific requirements apply to their situation. It is unclear how far such a system can practically go given the complexity and ambiguity in the layers of regulation, guidance, and standards.
- **Business Rule Engine**: This simplifies some aspects of IT system design by working from an explicit, human readable statement of all of the layers of business rules in regulations and other requirements. The simplest of these rules might read something like, "If discharge level of chemical exceeds threshold a violation exists." The new cloud-based SDWIS Prime system will make use of such an engine to enable burden reduction capabilities such as automated compliance functions, automated notifications to regulators and the regulated community regarding upcoming compliance deadlines, as well as to provide the ability for states to add state specific regulations to the engine.
- **Fillable Forms Platform**: This could be used to easily model and then generate e-transaction application interfaces that would entail a lower level of hand coding than traditional approaches. Potentially this platform could be used by states to extend the core data in federal forms with state-specific information, or to develop state-only applications which are hosted by EPA.
- **Environmental Data Element Catalog**: As EPA (and state) programs model their data collections as part of streamlining processes, this repository would collect and connect these models and their data elements using the EPA Data Registry. This will provide a browseable and searchable repository designed to help a wide range of users (regulation developers, report designers, system designers, etc.) understand what data is already collected where and by whom. Some work on this is already underway at EPA.

- **Data management and analytic tools**: Used to receive, process, and provide access to data collected via the advanced monitoring technologies and collection techniques.

E-Enterprise Shared Programmatic Infrastructure

This infrastructure supports the programmatic and business process improvements identified in Component #1 by providing common resources for use by individual projects to make their streamlining and modernization efforts more effective. Development of this infrastructure will depend on available resources and the interests and needs of program and state staff. We propose that as an early action item, EELC commission outreach and development of a strategy for determining what support would be most useful and how it could be sourced. Candidate elements include:

- **Training and Expert Availability**: Provide training on streamlining methodologies such as Lean. This could build on the strengths of each partner; for example, a state's leadership on Lean experience and EPA's new efforts to host internal Lean training. Over time these efforts could lead to the creation of a "Lean corps" as an asset for E-Enterprise projects to tap as needed, and would also help to support adoption and integration of an overall management approach based upon continuous process improvement.
- **Clearinghouse**: Establish a clearinghouse for information on state and EPA programmatic reforms. This may include specific highly-valuable artifacts such as process value stream maps produced during Lean analysis exercises. A clearinghouse could also include case studies of specific program reforms enabled by advanced IT or monitoring, as well as information about the technologies themselves.

EPA Region 7 and its states conducted Lean program business process reviews for several program areas. Such efforts represent the kind of joint program reassessment that is vital to E-Enterprise's success. Interestingly, while Region 7's efforts generated new proposed business processes that offer real improved efficiency, timeliness and effectiveness, participants noted that the collaborative review process itself was critical to build the partnership required to implement the changes. While the generated artifacts (e.g., value stream maps, proposed new business process descriptions, or software support applications) can provide a jumpstart to other Regions and states working on the same program areas, it may be that the EELC will need to sponsor similar joint process investments between other EPA regional offices and their respective state partners in order to generate ownership and buy-in for the solutions developed. In sum, the EELC must ensure that implementation projects seriously consider the opportunities for program modernization and streamlining, before applying technology to their business processes. The ability to provide programmatic assessment infrastructure to support reform efforts gives the EELC not just an additional tool with which to fulfill this responsibility, But a new management approach which can fundamentally transform for the better how environmental protection is delivered in the 21st century.

Section 5: Building E-Enterprise Through Implementation Projects

With an initiative as broad in scope as E-Enterprise there is often the question "What exactly IS E-Enterprise?" The short answer to this question is that E-Enterprise is a partnership that has a vision, a set of principles and components, and an ongoing set of projects all focused on transforming how we deliver environmental protection in this country. For most EPA and state staff, their touch point with E-Enterprise will be through an "implementation project," which implements new technologies, business process improvements or new management approaches for a given business area. Alternatively, an implementation project may build some piece of the shared infrastructure. Similar to the Exchange Network model, E-Enterprise implementation projects will develop some program reforms, information tool or advanced monitoring applications for a given business area, which are then available as solutions for adoption and implementation by partners. Therefore, two key measures of E-Enterprise's progress will be the total number of implementation project solutions and the adoption (where applicable) of those solutions by partners.

The discussion which follows assumes that there will be designated E-Enterprise funding available both within EPA and to states through a grant program, and that the EELC will be positioned to inform the distribution of those funds by clearly articulating priorities to states and EPA to use in their decision making. In order to screen and identify priority projects, the EELC will rely heavily on the business case analyses prepared by project proposers.

Description and Anticipated Use of Business Case Analysis

Design and Operating Principle #4 describes how the EELC plans on using business case analysis as a primary tool for project prioritization. The business case is also a tool for measuring progress and informing ongoing management. The EELC in its prioritization exercise is essentially making two determinations: whether the project takes advantage of the relevant E-Enterprise components, and whether the ROI compelling enough to justify pursuing the project.

The E-Enterprise Business Case Team developed business case materials including a business case overview for the E-Enterprise initiative and a template for business case analysis. The business case overview lays out the context and purpose of E-Enterprise, identifies conceptual principles and methods for building both project-level and enterprise-level ROIs, and explains how they are to be used. In addition, the team is outlining a set of information and criteria that would help the EELC assess the relative features of proposed E-Enterprise projects in support of both an initial screening review of project features and ROI and a more detailed, full business case assessment.

An additional component of the business case will be the development of project performance measures which can be used to track project implementation and performance. These measures would include project implementation milestones, performance in terms of reduced burden, and increased efficiency or broader "enterprise effects" in situations in which there are synergies among projects. The EELC would use these measures to oversee the projects, and to communicate project value (individually and overall as part of E-Enterprise) to external audiences.

Screening and Selecting E-Enterprise Technical Implementation Projects

IT projects, whether undertaken by EPA or states, must pass through numerous approval procedures before programmers write a single line of code. E-Enterprise should not add any more hurdles to these processes than is necessary to ensure E-Enterprise's overall success. As described above, the EELC will use the business case analysis as a project management resource. Project sponsors will have the usual expectation that, in order to receive E-Enterprise resources, they will need to comply with the program's requirements. It will be a management challenge for joint governance to strike the right balance in establishing these requirements. As discussed above, the core requirements for projects are: a) incorporation of the E-Enterprise principles and components, and b) a current (with annual updates) business case that demonstrates an adequate ROI, both of which will be aspects of the business case template. These project requirements will help to ensure that projects build toward a unified E-Enterprise program, and that the individual projects comprising the larger program provide adequate returns.

Ensuring Integration of Components into E-Enterprise Implementation Projects

The goal for EELC in establishing project requirements is that project proposers would, as part of their project design, build in E-Enterprise components where appropriate. And, of course, projects should advance or at least be consistent with the principles. The Blueprint is not intended, at this point, to provide the technical specificity to fully inform a project designer's plans for incorporation of the components,[24] but the table below provides a starting point for the issues a project designer will need to consider.

Component	Application to E-Enterprise Implementation Project Proposals
#1 Modernizing and Streamlining Our Programs and Regulations	Has the project explored program modernizations and streamlining and the development of new management approaches? Does the design strike the right balance between the costs of these changes and their potential benefits? Have the impacts on and opportunities for state-EPA joint business processes improvements been evaluated? What are the nature of and timelines for the required regulatory changes?
#2 Portfolio of Advanced Monitoring Technologies and New Data Analysis & Collection Techniques	Has this project considered the applicability of: • Advanced monitoring techniques; • New technology-enabled data collection techniques; and • New analysis technique services supporting the use of advanced monitoring data streams?
#3 E-Enterprise Portal	How will the project be integrated into and take advantage of the functionality of the E-Enterprise Portal, including establishment of user profiles, interface customization based on those profiles, and Portal federated identity?
#4 Partner Access and Transaction Systems	How has the proposed project accounted for the diversity of partner systems? What assumptions does the proposal make about state migration to EPA

[24] This will be developed in the follow-on documents to this Blueprint, including a "Concept of Operations" for the Portal, and an overall Technical Solutions Architecture.

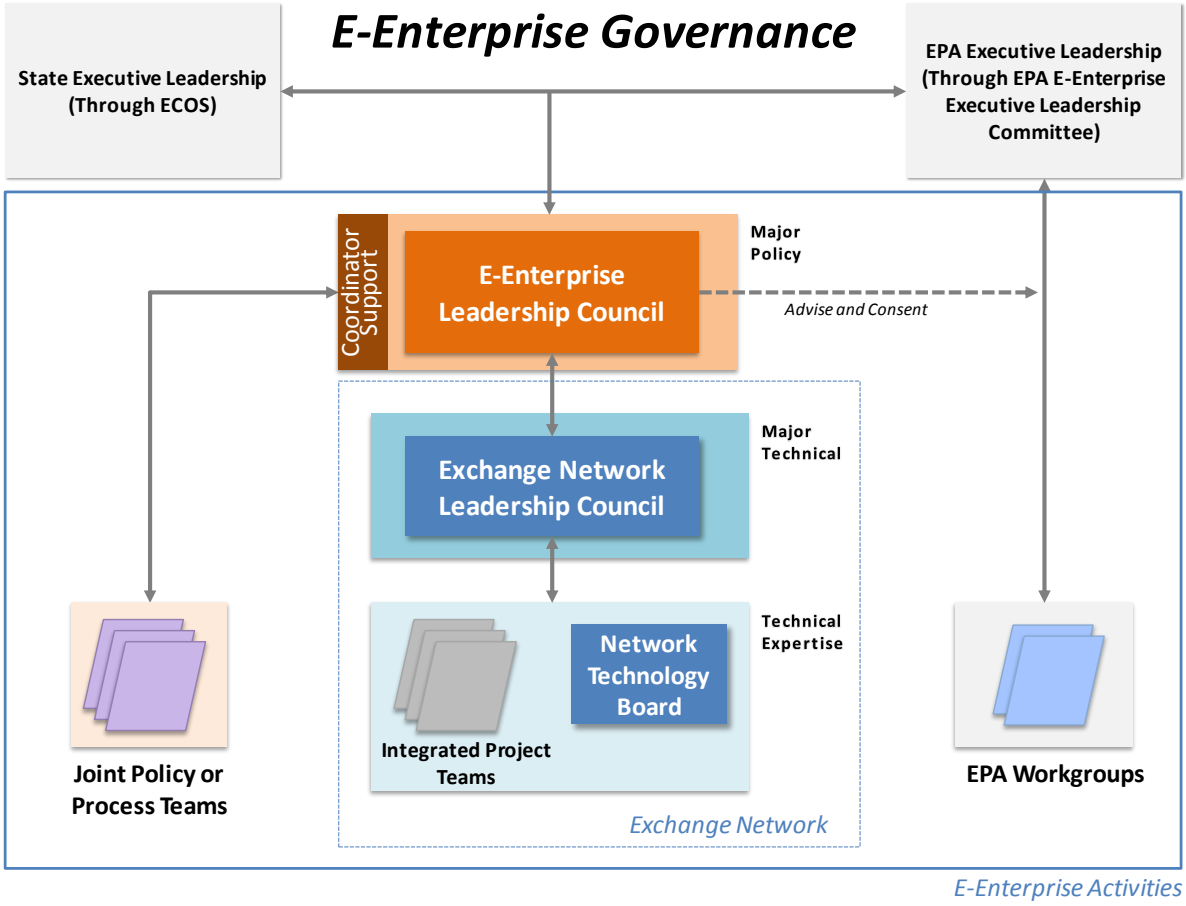
Component	Application to E-Enterprise Implementation Project Proposals
	systems (if applicable)? Does the design achieve a cost effective level of interoperability with existing state systems? This question may overlap with the web services question, since these services will be a primary mechanism for inter-operability. How is interoperability of state systems with the Portal achieved?
#5 E-Enterprise Open Data and Web Services	How does the project incorporate existing E-Enterprise web services, and create new data access or functional services? How is open data access (e.g., data for manual download) accommodated?
#6 Shared Infrastructure	Does the project propose appropriate use of E-Enterprise technical and programmatic infrastructure e.g., EPA's CDX services, the integrated identity store, and other key infrastructure components?

Section 6: State and EPA Joint Governance of E-Enterprise

As described in the E-Enterprise vision, E-Enterprise is an EPA and State joint commitment to a new business model that explores programmatic reforms and the development of new environmental management approaches. This commitment highlights the need of joint governance to manage change. Change is inherently difficult to manage and can be resource-intensive and disruptive. As E-Enterprise calls for changes in programs and business processes, it will also call for changes in some aspects of the state-EPA relationship. E-Enterprise seeks to take advantage of the opportunity presented by a shared vision and the availability of dedicated resources and new technologies, to call states and EPA into a broader conversation about how to jointly manage the enterprise of U.S. environmental protection. This may require stepping (at least temporarily) out of some familiar roles and debating positions. It will also require jointly managing change across programs, across organizations, and across functions. Holding this conversation and managing these changes will require strong leadership, trust among partners, clear expectations, transparency, and flexibility. The E-Enterprise governance structure and design, described below (See Figure 5), is built around these attributes.

The Blueprint focuses on the state-EPA relationship. As E-Enterprise moves forward, EPA and states will broaden the collaboration to include tribes, municipalities and other environmental authorities. We plan to invite tribes to join the states and EPA in the governance of E-Enterprise, similar to how tribes participate in the Exchange Network Leadership Council. E-Enterprise will also invite input from the regulated community, non-governmental organizations, educational institutions and the public.

Figure 5: E-Enterprise Joint Governance Structure



E-Enterprise governance will have to manage the tension between living up to these attributes and its inherent limitations as a multi-agency governing body. The joint governance structure is not a strictly representative body. Not every state has a representative on the governance body nor does every EPA interest have a seat at the table. Governance cannot "bind" its constituent parties to its decisions. Working within these limitations, states and EPA have established parallel organizational mechanisms within their respective constituencies. EPA has established a complementary internal governance structure, with dedicated senior staffing and some authority, to work closely with E-Enterprise governance. The states, through ECOS, have tapped an existing group structure and forum to collect information and feedback, and with which to vet decisions. The governance structure also identifies a key function—the E-Enterprise Coordinator—whose function is to staff the EELC, manage the work portfolio of the entire governance structure, and play an "air traffic control" function as issues work their way into and through the governance structure. The coordinator will provide an independent voice to discussions, and be an advocate for the E-Enterprise initiative. By means of a ratifying an EELC charter (September 2013), states and EPA affirmed the role and priority of the E-Enterprise initiative and their collective intent to abide by the EELC's recommendations to the maximum extent practicable. The EELC charter describes the E-Enterprise joint governance in detail (See Appendix D).

Section 7: Prioritized Next Steps for the Conceptual Blueprint

The State-EPA E-Enterprise Working Group will deliver this draft to the EELC as a recommendation. This will allow the EELC to refine and finalize the Blueprint based on the latest information concerning resources, joint governance membership, the status of projects already underway, and other outstanding issues. The Conceptual Blueprint calls for over 30 next steps for EELC. To support the EELC in its deliberations, the Working Group is providing the EELC with a prioritized subset of next steps. The Working Group went through a qualitative exercise to prioritize next steps and attempted to identify those next steps that would demonstrate early success, start progress across all components, and most importantly need to be completed first to best position E-Enterprise to succeed.

Prioritized Next Steps for EELC Consideration

Task #	Component or Section	Task	Description	FY14 Q2	FY14 Q3	FY14 Q4	FY15 Q1	FY15 Q2	FY15 Q3
1A	Component #1 Modernizing and Streamlining Programs and Regulations	Establish a list of E-Enterprise projects; conduct analysis to identify modernization and streamlining opportunities.	Collect a list of early projects proposals and conduct an analysis to identify additional modernization and streamlining opportunities and compile examples of proposed new environmental management approaches. Use the analysis to identify early 'wins', help define the desired attributes for future proposed projects, communicate the results back to the program areas, and document candidate projects to become EELC focus areas. The criteria for selecting projects are developed in activity 7C.						
1B	Component #1 Modernizing and Streamlining Programs and Regulations	Identify programmatic modernization support resources.	Identify available resources to provide projects working on modernization and streamlining efforts. This should include coordination with program improvement projects funded under the Exchange Network Grant Program.						
2A	Component #2 Advanced Monitoring	Establish EELC advisory staffing for advanced monitoring.	Identify and/or implement an advanced monitoring technology policy team to support the EELC. To the extent possible the EELC should leverage existing organizations and networks of monitoring technology experts.						
3A	Component #3 E-Enterprise Portal	Prioritize Portal functionality, including provisions for cross-portal interoperability.	Conduct outreach and analysis necessary to prioritize portal capabilities, including portal inter-operability for the regulated community to achieve burden reduction, improved data quality, and other benefits. Conduct corresponding outreach and analysis for the public portal. This analysis will support the *Portal Concept of Operation* discussed in activity 6A below.						
4A	Component #4 Partner Access and Transaction Systems	Identify and prioritize state project types.	Compile information regarding current and future State reporting-Enterprise type development efforts. Using this list, identify the types of state implementation projects to advance broader E-Enterprise goals. Document recommendations for consideration by EPA to inform an E-Enterprise						

Task #	Component or Section	Task	Description	FY14 Q2	FY14 Q3	FY14 Q4	FY15 Q1	FY15 Q2	FY15 Q3
			grant program.						
6A	Component #6 Shared Programmatic and Technical Infrastructure	Develop foundational technical documentation including: • *E-Enterprise Solutions Architecture* • *E-Enterprise Services Portfolio and Implementation Strategy* • *Concept of Operations for the E-Enterprise Portal* • *Concept of Operations for Federal Identity*	The following interrelated documents comprise the foundational set of specifications for E-Enterprise. Each document can be concurrently developed and work that is common across the documents, such as requirements gathering, may be combined. Requirements gathering, research, and outreach are critical steps in the development process for all of these products are reflect the conceptual blueprint principle to empathize the user perspective in the design and operation of E-Enterprise infrastructure. *E-Enterprise Solutions Architecture*: This product will establish and define the E-Enterprise architecture, describe the technical requirements for building the architecture, and the mechanisms for interfacing with the architecture. *Version 1.0 E-Enterprise Services Portfolio and Implementation Strategy*: This product will identify and described the portfolio of E-Enterprise services, hosting options, and include state or other partner hosted services. *A Concept of Operations for Federated Identify*: This product provides identification and documentation of critical use cases for federated identity, including interaction of identity store(s) options with EPA national systems, portal(s), and state systems. *Concept of Operations for E-Enterprise Portal*: Based on the analysis conducted in activity 3A, this product would describe the high-level technical architecture and operation of the Portal(s), including functionality, interfaces to EPA and State programs and other systems, and proposed identity management services.						
7A	Joint Governance	Commission the development of the *E-Enterprise Implementation and Management Plan.*	An *E-Enterprise Implementation and Management Plan* will define, in detail, the management framework the EELC will use to build and implement E-Enterprise projects and components and manage their operation.						

Task #	Component or Section	Task	Description	FY14 Q2	FY14 Q3	FY14 Q4	FY15 Q1	FY15 Q2	FY15 Q3
7B	Joint Governance	Establish and identify resources for the EE Coordinator role.	Identify resources for the E-Enterprise Coordinator, establish the roles and responsibilities, and hire into the position.						
7C	Joint Governance	Establish and adopt a process, criteria, and format to use in prioritizing E-Enterprise projects.	The EELC will establish and formally adopt a process, criteria, and format to use in prioritizing E-Enterprise Projects. The business case template and framework developed by the EPA/ECOS E-Enterprise Working Group will form the basis.						
7D	Joint Governance	Identify the role of other stakeholders in EE joint governance and clarify their role in the EELC Charter.	There are several other partners and stakeholders interested in participating in Joint Governance, specifically tribes and other government environmental regulators. The EELC must also establish a standard approach for gathering input from other interested stakeholders, such as the regulated community, media associations, and the public.						

Complete List of Next Steps by Component

Those tasks that the Working Group suggested as priorities for consideration by the EELC are marked with an asterisk in the separate tables below.

Component #1: Modernizing and Streamlining Programs and Regulations

Component #1 Tasks	Description
1A: Establish a list of E-Enterprise projects; conduct analysis to identify modernization and streamlining opportunities.	Collect a list of early projects proposals and conduct an analysis to identify additional modernization and streamlining opportunities and compile examples of proposed new environmental management approaches. Use the analysis to identify early 'wins', help define the desired attributes for future proposed projects, communicate the results back to the program areas, and document candidate projects to become EELC focus areas.
1B: Identification of near term, programmatic modernization support resources	Per the discussion in the Shared Programmatic Infrastructure Component #6, identify existing resources that can be provided in the near term to projects working on modernization and streamlining efforts. This should include coordination with program improvement projects funded under the Exchange Network Grant Program.

1C: Identification of "Special Focus" project for 2014	The Blueprint calls for EELC to identify one project per year for "special focus" to perform a "bottoms up", more complete examination to identify modernization, streamlining, or new approach development opportunities. This will require a willing program office(s) and significant state interest/staffing. This project would be first in line to receive support from the EELC program modernization infrastructure described in Component #6.
1D: Modernization and Streamlining Checklist	Evaluate utility of developing a modernization, streamlining, and new approaches checklist to support project teams in identifying opportunities.

Component #2 Portfolio of Advanced Monitoring Technologies and New Data Analysis and Collection Techniques

Component #2 Tasks	Description
2A: Establish EELC advisory staffing for advanced monitoring.	Identify and/or implement an advanced monitoring technology policy team to support the EELC. To the extent possible the EELC should leverage existing organizations and networks of monitoring technology experts.
2B: Advanced monitoring implementation roadmap	EELC with EPA ORD and state science staff participation, develop (or adopt an existing) five year technology outlook, including opportunity pipeline of near-pilot and pilot-ready technologies. The outlook would also identify areas of programmatic greatest need to inform and encourage innovation by 3rd parties.
2C: Near-term Opportunities for Advanced Analysis and New Data Collection Techniques	For near-term technologies identified in the roadmap, develop matching candidate opportunities for the advanced analysis and data collection techniques needed to make use of these new data sources. These would be used by project proposers to assess and develop analysis and data collection opportunities for their projects.
2D: Advanced Monitoring Information Management Support	Identification and characterization of software and services required to support collection, management, analysis and display/communication of advanced monitoring sourced data, for the near term opportunities identified above.

Component #3 E-Enterprise Portal

Component #3 Tasks	Description
3A: Prioritize Portal functionality, including provisions for cross-portal interoperability	Conduct needed outreach and analysis to define and prioritize Portal capabilities, including Portal inter-operability for the regulated community in terms of burden reduction, improved data quality and other benefits. Conduct corresponding outreach and analysis for Public Portal. This analysis would support the Portal Concept of Operation discussed in component #6 below.

Component #3 Tasks	Description
3B: Portal Build/Buy/ Host/Adapt Analysis	In coordination with the Concept of Operations, conduct analysis of platform options for Portal functionality. These may include evaluation of existing COTS portal platforms, cloud hosted services, or other options. This analysis would be integrated into the technical solutions architecture.
3C: EPA Internal Capital Planning Requirements	Required analysis and documentation needed to fulfill EPA internal capital planning requirements for the portal(s). This assumes that EPA will fund the Portal as a separate major IT investment and not combine its proposal with other new or existing systems.
3D: Develop Public Mobile/Geolocation Application Strategy	Develop a brief, near term mobile and geolocated device strategy for E-Enterprise. This could include assessment of the role of the Portal in providing mobile interfaces, a clearinghouse of existing mobile applications and highlighting of proposed and in-progress mobile application development projects.

Component #4 Partner Access and Transaction Systems

Component #4 Tasks	Description
4A: Identify and prioritize state project types	Compile information regarding current and future State reporting-Enterprise type development efforts. Using this list, identify the types of state implementation projects to advance broader E-Enterprise goals. Document recommendations for consideration by EPA to inform an E-Enterprise grant program.
4B: Identification of Cross-portal Interoperability Options	Based on the outreach and functionality prioritization analysis conducted for the Portals, evaluate and select targets and methods for first generation cross-portal interoperability.
4C: State Interoperability Pilots	Pilot implementation of the interoperability options identified above.
4D: E-Transaction Functional Targets and Best Practices	States and EPA could partner to develop a checklist, with examples, of priority functionalities and best practices. These could be used to inform EPA and state system development. Where grant resources are available, this checklist could be used to inform grant guidelines for proposed investments.
4E: Identification and Prioritization of Initial State Project Types	Identification and prioritization of the types of state implementation projects which would best advance broader E-Enterprise goals These recommendations might be used by EPA to inform an E-Enterprise grant program.

Component #5 Open Data and Web Services

Component #5 Tasks	Description
5A: Identify data service customers priorities	Identify priority data service customers and their data service needs, not satisfied by current data services. This may uncover high interest in datasets not collected by EPA or states. Presuming that these data are available from other sources this would indicate partnering opportunities. Where these data are not collected, such information could be incorporated into a State-EPA data acquisition agenda.
5B: Consolidate Current Collective Knowledge and Efforts on Web Service Development	Conduct fact finding and compile from EPA (including pending EPA Open Data /API Policy, OEI/Program services and Data.gov work), Exchange Network, State, private sector, and other sources lessons learned and best practices relevant to the E-Enterprise service universe. Develop an E-Enterprise categorization system for services to aid in their management and tracking.
5C: Compile/develop Version 1.0 E-Enterprise Services Portfolio and Implementation Strategy	Based on the initial E-Enterprise project portfolio, compile/develop and prioritize required services in the categories identified above (as updated from time to time). This will include state or other partner hosted services. Identify service hosting options.

Component #6 Shared Technical and Programmatic Infrastructure

Component #6 Tasks	Description
6A: Develop E-Enterprise foundational technical documentation including: • *E-Enterprise Solutions Architecture* • *E-Enterprise Services Portfolio and Implementation Strategy* • *Concept of Operations for the E-Enterprise Portal* • *Concept of Operations for Federal Identity*	The following interrelated documents comprise the foundational set of specifications for E-Enterprise. Each document can be concurrently developed and work that is common across the documents, such as requirements gathering, may be combined. Requirements gathering, research, and outreach are critical steps in the development process for all of these products are reflect the conceptual blueprint principle to empathize the user perspective in the design and operation of E-Enterprise infrastructure. *E-Enterprise Solutions Architecture*: This product will establish and define the E-Enterprise architecture, describe the technical requirements for building the architecture, and the mechanisms for interfacing with the architecture. *Version 1.0 E-Enterprise Services Portfolio and Implementation Strategy*: This product will identify and described the portfolio of E-Enterprise

Component #6 Tasks	Description
	services, hosting options, and include state or other partner hosted services. *A Concept of Operations for Federated Identify*: This product provides identification and documentation of critical use cases for federated identity, including interaction of identity store(s) options with EPA national systems, portal(s), and state systems. *Concept of Operations for E-Enterprise Portal*: This product would describe the high-level technical architecture and operation of the Portal(s), including functionality, interfaces to EPA and State programs and other systems, and proposed identity management services.
6B: Development of Implementation Plan for Federated Identity Initial Pilots	Develop plan for federated identity pilots for key use cases. Coordinate these pilots with the portal interoperability pilots
6C: Implementation Plan for Version 1.0 Shared Technical and Programmatic Infrastructure Components	Develop implementation and phasing plan for the initial set of infrastructure sub-components. Coordinate this plan with development of a broader E-Enterprise Implementation and Management Plan.

Next Steps for Joint Governance

Tasks for Joint Governance	Description
7A: Commission Development of an E-Enterprise Implementation and Management Plan	An E-Enterprise Implementation Plan and management plan will define, in detail, the steps to build and implement E-Enterprise projects and components and manage their operation. The plan will include identifying the list of work for the ENLC and other supporting joint governance groups. Given its import, this product will require especially thorough vetting, through the EELC, via its parallel internal EPA and ECOS State management structures.
7B: Identify the role of other stakeholders in joint governance and clarify their role in the EELC Charter.	There are several other partners and stakeholders interested in participating in Joint Governance, specifically tribes and other government environmental regulators. The EELC must also establish a standard approach for input from other interested stakeholders, including but not limited to the regulated community, media associations, and the public.
7C: Establish and Identify Resources for the Coordinator Role	For the E-Enterprise Coordinator, EPA and ECOS must identify resources for, establish, and hire into this position.
7D: Establish Business Case Template and Framework	The EELC will establish and formally adopt the business case template and framework.
7E: Advanced Monitoring Advisory Staffing	The initial work of identifying and establishing the Advanced Monitoring Portfolio may be completed by a temporary Integrated Project Team. The EELC must have

(See also Advanced Monitoring Component)	advisory/staffing support to maintain the advanced monitoring portfolio. None of the standing governance bodies have the appropriate expertise to manage the portfolio. [25]

[25] There may be existing EPA/ORD or ECOS bodies that could fulfill this role.

Appendix A: Transparency and E-Enterprise

Improving the transparency of environmental performance and of our collective administrative processes are both a critical ends and means to achieving the E-Enterprise vision. Transparency raises the bar on environmental agencies for public access to data. It seeks to place information into the relevant context for a given user at a given point in their search, transaction, or decision making process. This is not a new concept, our best environmental web sites weave information together targeted at specific users at a specific business process points (e.g., permitting information to applicants as they apply). EPA's recent adoption of topical "micro-sites" for EPA.gov is another example. E-Enterprise will seek to apply advanced technologies for creating and cross-referencing content as well as staff training to provide improvements in our collective capabilities to provide context alongside data, and thereby improve transparency. We see this transparency as an important driver in changed behaviors on the part of the public, and improved environmental performance of the regulated community.

Program Design and Transparency

Government process experts at the Harvard University Kennedy School identified 10 principles for crafting effective transparency supporting policies a paper titled "Transparency Polices: Two Possible Futures."[26] These principles are:

1. Provide information that is easy for the public to use
2. Strengthen user groups
3. Help disclosers understand users changed choices
4. Design for discloser benefits
5. Design metrics for accuracy and comparability
6. Design for comprehension
7. Incorporate analysis and feedback
8. Impose sanctions
9. Strengthen enforcement
10. Use other regulatory systems

The following table lists how these principles could be applied to E-Enterprise.

E-Enterprise Application of Transparency Principles

Transparency Principle	Starting Point Application to E-Enterprise
Provide information that is easy for the public to use	Basic premise for the functionality of the public facing aspects of the E-Enterprise Portal.
Strengthen user groups	Social media provides a new context into which information can be published. Users can interact with each other to add context and also communicate with the agency.
Help disclosers understand users	If E-Enterprise supports more extensive disclosure of environmental

[26] "Transparency Polices: Two Possible Futures" By Archon Fung, Mary Graham, David Weil, and Elena Fagotto, Kennedy School of Government Taubman Center Policy Brief. Available online at: http://www.ftc.gov/be/workshops/mortgage/articles/funggraham2007.pdf

Transparency Principle	Starting Point Application to E-Enterprise
changed choices	performance information, and if this information can be better integrated with consumer and business decisions about locations or products, it may raise the stakes for those disclosers, and change their environmental performance.
Design for discloser benefits	Where possible, E-Enterprise should the fact that disclosers have met or exceeded disclosure requirements transparent.
Design metrics for accuracy and comparability	Where possible, E-Enterprise will seek to use new technologies to enable the development of practical, accurate, comprehendible and comparable measurements of environmental conditions and performance. This must include new approaches to ensure collection of essential analytical method and quality assurance metadata.
Design for comprehension	E-Enterprise will seek to provide improved contextual data to support improved interpretation of the provided data
Incorporate analysis and feedback	EPA and partners are already increasingly using feedback tools and social media to better understand user needs, and identify new information resources.
Impose sanctions	Our regulatory framework provides sanctions for non-reporters, but there may be other sanctions (imposed by agencies or third parties using published data) such as negative recognition that could motivate non-disclosers in disclosure programs.
Strengthen enforcement	Where information disclosure becomes an enforceable requirement, enforce to provide a disincentive to non disclosure.
Use other regulatory systems	By improving our joint capabilities to integrate data across agencies (environmental, health, and others), we can use data in a larger context.

Appendix B: Technology Trends with Potential Implications for E-Enterprise

EPA and the states are motivated to implement E-Enterprise principles by a number of technology trends. These trends are helping agencies consider potential improvements to environmental protection actions and ways to provide improved service to the regulated community and the public. In parallel with these programmatic drivers are trends in the evolution of information and monitoring technologies. Information technology trends have major implications for how technologies can be harnessed to meet environmental management challenges. Taken together, these technology trends represent as big a potential opportunity as the initial applications of the Internet in first generation e-government efforts. The focus on technology is not meant to diminish the importance of the evolution and improvements needed in the underlying business processes. The technology trends can be a supporting mechanism for the changes required in business processes. The table below outlines the most important of technology trends and identifies their implications for E-Enterprise.

Technology Trends and Potential Implication for E-Enterprise

Trend	Definition	Potential Implications for E-Enterprise
Data Explosion/Big Data	Management and analysis of very large data sets, requires specialized approaches and technologies	*New tools will enable users to draw useful information from the ever growing torrents of new data from new sources.* • Advanced monitoring systems will produce data sets of massive depth (e.g., continuous) and breadth (e.g., distributed, crowdsourced). • An important E-Enterprise service may be to offer sub-sets or summary analysis of these data as web applications and/or data services. • New users will need tools/assistance in using and interpreting these data. • See Component #8: Open Data and Web Services
Mobile devices as primary interfaces	Mobile/tablet devices becoming a dominant source and destination for data and application services. These range from inspector's dynamic inspection checklists to smartphones with sensors.	*Mobile devices will enable delivery and collection of more new data to existing and new users, including inspectors, field staff, and citizen monitors* • Most applications should be mobile-friendly. • Mobility can support a wide range of functions such as dynamic inspector checklists to crowdsourced data collection. • Web services are especially important to enable mobile application developers. • Ready access to data may create need/expectation for quicker government response to questions • See Components #3 E-Enterprise Portal and #5 Open Data and Web Services

Trend	Definition	Potential Implications for E-Enterprise
Cloud Computing	Hosting of data and application services on third party infrastructure.	*Cloud commuting can lower program IT costs while expanding the power and accessibility of hosted applications.* • E-Enterprise seeks to establish a "cloud" of services (including shared infrastructure) that can be used to power customer-centric applications. • Cloud hosting is not free, as the government still needs to pay a contractor to host the systems and data. Thus, financing of these services must be considered. They are not free but they are significantly less expensive than comparable on site computing power. • As state IT managers grow comfortable with the idea migration of existing applications to cloud hosting, they may be more comfortable using applications hosted in the E-Enterprise shared environment. • Ease with which data can be moved into and out of the cloud enables many new application approaches (e.g., data upload services for citizen monitoring).
Content Customization/ User Profile and Radical Transparency	Through the use of user profiles, users can customize their interface and data access. Users expect complete transparency of all aspects of their transactions.	*Programs will be able to provide customized, targeted information directly to individual users.* • Providing "myEPA" functionality is a core E-Enterprise concept. See Component #3 E-Enterprise Portal.
Web Services and Supporting App Developers	Making data available for download or published as a service is now accepted as core function of government. This perspective views application developers as a critical audience and consumer.	*Enable the real time integration of data from multiple sources, across applications and program business lines, and the development of more targeted special purpose applications.* • Web services will provide the plumbing for much of E-Enterprise partner interoperability • See Component #5 Open Data and Web Services

Trend	Definition	Potential Implications for E-Enterprise
Everything has a location	Location has evolved from an arduously collected data element to a pervasive and presumed feature. As geolocation services improve and as more data streams include locational references, location becomes a key integrating capability. GPS built into sensors, phone cameras and tablets will produce a stream of geolocated data. As GIS software moves to the cloud, more powerful capabilities are available to more users.	*Allow spatially based integration of data from more, different and new sources into special purpose business driven applications.* • In combination with the open data and web services strategy, locational data enables new kinds of apps and new sources of data. See Component #6 E-Enterprise Shared Technical and Programmatic Infrastructure.
Pervasive Advanced (and Networked) Monitoring Technologies	The capabilities, size and cost of monitoring technologies are rapidly changing, as is their connectivity. These capabilities enable new (in many cases unanticipated) types of application to be developed.	*Provide agency staff, regulated entities and the public with access to more different data from more and different sources.* • See Component #2 Advanced Monitoring

Semantic Technologies: Modeling our Environmental Knowledge	These technologies are seen as the next major evolution of the web from a network of documents linked by text links to links based on the meaning of the underlying concepts. These technologies use an explicit model of knowledge to better organize and link information.	*Allows for integration of data based on underlying concepts (e.g., contaminant or stressor), this broadens the types of data available for integration into applications that can more closely model the complex business scenarios (e.g., watershed assessment) they are designed to support.*
		• Semantic technologies could play a key role in supporting provision of a more context rich environment. Examples:
		  ○ Supporting navigation from locations of environmental concern.
		  ○ Identification of the environmental monitoring going on in that area.
		  ○ Toxicity, exposure and risk information about the monitored chemicals.
		• Semantic technologies may also be the best way to manage regulatory applicability information to regulated entities, by creating explicit knowledge models of the regulations. These representations can then be queried to provide context sensitive answers.
		• See Components #3 E-Enterprise Portal and #5 Open Data and Web Services.

Trend	Definition	Potential Implications for E-Enterprise
Social Networks as a new platform to interact with environmental data	Social networks continue to grow, and the sophistication of the applications developed on top of them, or using data derived from them via web services continues to advance.	*Provide powerful new channels for information distribution, collection and interaction. Will require states and EPA to develop new information strategies as they did with web 1.0.* • Social networks have become an important means of distributing and sourcing environmental information. Affinity groups can be formed around environmental issues and geographies with customized information or applications. • Social networks can also act as the platform for crowdsourcing, environmental data, or vetting the quality of data (a sort of mass citizen science). • See Component #5 Open Data and web services

Appendix C: Federal Context for E-Enterprise

The same technology trends that inform E-Enterprise recently have motivated several federal government strategies and executive orders. E-Enterprise is highly consistent with the major themes of these initiatives and with EPA's responses to them. These federal initiatives are both drivers and operating context for EPA as a federal agency. The table below identifies the most applicable federal directives and crosswalks the relevant sections with the related E-Enterprise principle or component.

Federal Context for E-Enterprise

Federal Documents Related to E-Enterprise	Related E-Enterprise Principles and Components
Whitehouse Digital Government Strategy[27]	
Strategy Objectives: ● Enable access of digital government information and services anywhere, anytime on any device ● Unlock the power of government data "…by ensuring that data is open and machine-readable by default."	See Principle #8 Open Data and Web Services: web services are a key enabler of both mobile applications and accessibility.
An "Information-Centric" approach—Moves us from managing "documents" to managing discrete pieces of open data and content which can be tagged, shared, secured, mashed up and presented in the way that is most useful for the consumer of that information.	E-Enterprise Portal concept includes content syndication where high value environmental information content can be structured, shared and integrated into partner applications
A "Shared Platform" approach—Helps us work together, both within and across agencies, to reduce costs, streamline development, apply consistent standards, and ensure consistency in how we create and deliver information.	See Principle #10: Shared Technical Infrastructure. Commonly needed functionality is created once and used by many applications and partners.
A "Customer-Centric" approach—Influences how we create, manage, and present data through websites, mobile applications, raw data sets, and other modes of delivery, and allows customers to shape, share and consume information, whenever and however they want it.	See Principle #5: Emphasizing User Perspective E-Enterprise Portal and state portals will be customer-centric, allowing users to customize and target exactly the content and data they are most interested in.
A platform of "Security and Privacy"—Ensures this innovation happens in a way that ensures the safe and secure delivery and use of digital services to protect information and privacy.	Principle #8: Open Data and Web Services discuss the context of statutory or administrative requirements for data confidentiality and security of data resources.
Executive Order 13563 - Retrospective regulatory reviews[28]	
Electronic reporting, EPA intends to replace outdated paper reporting with electronic reporting. Agency reporting requirements are still largely paper-based, which is inefficient and unnecessarily resource-intensive for reporting entities and states, and ineffective for compliance monitoring and assurance…	Electronic reporting and improved transparency are core aspects of E-Enterprise.

[27] Available online at: http://www.whitehouse.gov/sites/default/files/omb/egov/digital-government/digital-government.html
[28] Executive Order 13563 of January 18, 2011. *Improving Regulation and Regulatory Review*. Available online at: http://www.gpo.gov/fdsys/pkg/FR-2011-01-21/pdf/2011-1385.pdf

Federal Documents Related to E-Enterprise	Related E-Enterprise Principles and Components
Improved transparency "…EPA will strive to expand public disclosure of pollution, compliance, and other regulatory information, and provide communities with information about their environmental quality in a cost-effective and efficient manner…"	Transparency is part of the vision of E-Enterprise.
Innovative compliance approaches "…the Agency intends to reduce pollution by improving compliance with EPA regulations in ways that are more effective and efficient while reducing burden…" Systems approaches and integrated problem-solving. "To supplement traditional compliance approaches EPA plans to routinely structure federal regulations and permits as effectively as possible to achieve compliance, through adequate monitoring requirements, public disclosure, economic incentives, information and reporting mechanisms and other structural incentives, including self-certification, third-party verification, and ambient monitoring in the community…"	Component #1: Modernizing and Streamlining Programs and Regulations identifies the need for systemic, integrated exploration of program streamlining and innovative new environmental management approaches including those enabled by these new technologies. These programmatic reform opportunities are held to have equal importance to technology improvements.
Executive Order Making Open and Machine Readable Data the New Default [29]	
"…the default state of new and modernized Government information resources shall be open and machine readable."	See Principle #8: Open Data and Web Services
DRAFT – EPA Policy Statement on eReporting for EPA Regulations	
The purpose of the policy statement is to establish that at the start the regulatory process the assumption is reporting will be electronic, unless there is a compelling reason to use paper. Further the policy statement reinforces the need to use shared infrastructure and services to the maximum extent possible.	See Principle #6: Network of Services and Systems to Improve Two-way Business Transactions See Principle #10: Shared Technical and Programmatic Infrastructure

E-Enterprise projects are expected to be aligned with and use the E-Enterprise components. However E-Enterprise goes beyond the application of technical components to include the program and policy changes needed to implement business process improvements and new management approaches. Thus E-Enterprise is, in part, an organizational change effort, which will require flexibility on the part of all partners as these new processes and approaches are explored. The table below provides examples for some E-Enterprise partners of the areas and issues for which flexibility may be required.

Areas of Flexibility to Support E-Enterprise Implementation

Partner	Areas of Required Flexibility
OEI	Flexibility in support of program and state employment of shared infrastructure and services, where possible accommodating program or state specific requirements.

[29] Executive Order -- Making Open and Machine Readable the New Default for Government Information. May 09, 2013. Available online at: http://www.whitehouse.gov/the-press-office/2013/05/09/executive-order-making-open-and-machine-readable-new-default-government-

Partner	Areas of Required Flexibility
EPA Programs	Willingness to accommodate and use shared infrastructure, despite imperfect support of all desired features. Early engagement with states where appropriate, and exploration of the maximum practical level of program reform and new approach development prior to automation. Consider advanced monitoring techniques and programmatic reforms they could enable.
OECA	Support for trials of new compliance assurance/monitoring approaches enabled by program reforms, advanced IT, or monitoring applications.
EPA Regions	Willingness to initiate and participate in program reviews with states where state and EPA business processes are intertwined, and explore new management approaches and working relationships.
State Program and System Managers	Consider where changes to existing programs and systems to allow re-use of shared services (including CROMERR services), shared technical infrastructure, EPA- hosted applications or new management approaches developed by other states are feasible. This may include adjusting some unique state specific requirements to enable adoption of EPA or other state systems.
State Portal Managers	Adoption of Portal interoperability services and approaches, even where their first generation performance is limited. Identification and implementation of unique state information assets as services for use by EPA.

E-Enterprise success will depend upon ensuring that the individual implementation projects are, as far as possible, consistent with the E-Enterprise framework and components, and on the willingness and ability of partners to enacting the flexibilities identified above.

Appendix D: The E-Enterprise Governance Charter

The E-Enterprise Governance Charter was finalized by the E-Enterprise Joint Working Group for review and adopted at the 2013 Fall ECOS National Conference.

Charter for State and EPA E-Enterprise Leadership Council

September 5, 2013

E-Enterprise Vision: E-Enterprise for the Environment (E-Enterprise) is a joint initiative of states and EPA to improve environmental outcomes and dramatically enhance service to the regulated community and the public by maximizing the use of advanced monitoring and information technologies, optimizing operations, and increasing transparency.

This charter establishes the State and U.S. Environmental Protection Agency (EPA) E-Enterprise Leadership Council (EELC).

E-Enterprise Leadership Council Mission

To lead and manage E-Enterprise for the Environment; a transformational 21st century approach to environmental protection.

The EELC will lead and manage the refinement and implementation of the E-Enterprise initiative. The EELC's responsibilities include identifying, soliciting, reviewing, and prioritizing E-Enterprise projects, identifying State and EPA resources (existing and new investments) needed to support these projects, resolving policy issues impeding E-Enterprise project implementations, developing performance measure and tracking progress, ensuring inclusion of all relevant stakeholder perspectives, chartering and overseeing appropriate teams as needed, and taking other actions as deemed necessary to achieve the vision of E-Enterprise.

The Work of E-Enterprise

E-Enterprise will improve transparency and efficiency, develop new environmental management approaches, and employ advanced information and monitoring technologies in a coordinated effort to manage and modernize environmental programs. Fully achieving the E-Enterprise vision requires States and the EPA to collectively recast the business model of environmental protection for the United States and, in doing so, redefine how regulators interact among themselves, with regulated entities, and with the public. This transformation occurs through the EELC managing, coordinating, and/or shaping projects to:

- streamline and improve existing processes, activities, and requirements, including looking for new ways to use information and advanced monitoring technologies;
- explore new ways of doing existing business, including enabling new environmental management approaches;
- assure new efforts are consistent with the E-Enterprise vision; and
- leverage E-Enterprise shared technical and programmatic services.

Structure and Management Relationships

ECOS and EPA appointments to the EELC will bring together State and EPA executives to provide support and leadership to E-Enterprise. The E-Enterprise governance structure (Figure 1), of which the EELC is the head, dovetails with the Exchange Network governance and will build upon the Exchange Network's foundation of experience and success. The E-Enterprise governance structure formally ties EELC membership to existing ECOS and EPA management structures to assure that the recommendations of the EELC integrate into the respective State and EPA lines of authority. Through ECOS, EELC state members have a natural venue in which to discuss issues and collect feedback from other states. Linking to EPA's internal E-Enterprise governance

structure allows the EELC to establish an authoritative connection into the work of the program offices and advise on activities for specific program areas.

The EELC membership has an emphasis on senior *program* leadership to ensure that it is well positioned to consider programmatic and policy issues. This means that discussions of technical issues will largely occur elsewhere. The E-Enterprise governance structure expects the Exchange Network governance, the Exchange Network Leadership Council and Network Technology Board, to assume responsibility for E-Enterprise information technology issues and infrastructure. The EELC will work closely with the Exchange Network to ensure that ongoing technical evolutions are consistent and complementary. In situations in which existing internal process require updating, the EPA and the States may rely on internal governance processes to manage internal development activities. This may include both shared technical components and those components developed for internal use but offered to all partners.

The E-Enterprise Coordinator (Coordinator) is the primary staff for the EELC. The Coordinator manages the work portfolio of the entire E-Enterprise governance structure and coordinates the flow of issues as they work their way into and through the governance structure. The Coordinator will also conduct any necessary research on items as the EELC directs. The Coordinator reports to the EELC and will provide an independent voice in EELC deliberations and advocate for the E-Enterprise initiative within EPA, the States, and with outside stakeholders. The Coordinator works with the chairs of the EELC to ensure that issues are ready for the EELC to discuss.

Much of the work of the EELC is conducted between meetings by staff and resources identified by the EELC and managed by the Coordinator. The EELC may fulfill this support function through a variety of configurations, including contractors, the formation of issue-specific "Joint Policy or Process Teams" or the designation of individual State and/or EPA subject matter experts who are asked to prepare materials for the EELC. The EELC will charter the Joint Policy or Process Teams to, at a minimum, identify their scope, charge, membership, and duration. The EELC may also charter teams to perform ongoing functions such as communications and stakeholder engagement. The EELC will recognize and work with existing collaborative State-EPA groups that are implementing parts of E-Enterprise to ensure alignment with the E-Enterprise vision. The EELC may charter additional teams or rely on other organizations to develop and implement parts of E-Enterprise, e.g., the advanced monitoring component of E-Enterprise. The Coordinator will be the primary interface between the EELC and the staff and teams working on E-Enterprise.

EELC Membership

The EELC will have 18 standing members, consisting of nine representatives from the states and nine representatives from the EPA. Of the 18 members, there will be one EPA co-chair and one State co-chair. The co-chairs have the additional responsibility of working closely with the Coordinator to establish the agenda for EELC calls and meetings. They will also cooperatively chair all EELC calls and meetings.

The members of the EELC must have a suitable level of responsibility to make recommendations on policy and programmatic issues likely to be involved in E-Enterprise projects and EELC membership will have expertise across most media areas. Establishing and maintaining the appropriate level of authority, skill sets, expertise, and experience mix will remain an explicit responsibility of EPA and ECOS as they work to select and replace members. ECOS and EPA will both strive to fill vacancies as expeditiously as possible.

The nine State members on the EELC will be appointed exclusively by the ECOS Officers and will consist primarily of Commissioner and Assistant Commissioner-level personnel and State senior-level program leaders. The members will, as a general matter, be drawn from the leadership and membership of the range of ECOS standing committees and work groups, with the overall objective of providing a diverse range of talents,

interests, geographic variation, program area responsibility and experience, and other factors deemed appropriate by the ECOS Officers as being essential to the success of the EELC. All ECOS members will serve set, staggered terms as prescribed by, and at the will of, the ECOS Officers. The State Co-Chair will provide regular updates to ECOS per its by-laws and other procedures established by ECOS.

The nine EPA members of the EELC will be selected by the EPA Deputy Administrator. These members will include an EPA Co-Chair (e.g., the EPA Deputy Administrator) and senior managers from most of the national program offices, including the Office of Environmental Information, the Office of Enforcement and Compliance Assurance, and two regional offices. Most of the EPA members will be at the Assistant Administrator, Regional Administrator, Deputy Assistant Administrator, or Deputy Regional Administrator level. The EPA members will represent the interests of EPA's programs and policies and will work in close coordination and collaboration with EPA's internal management structure for E-Enterprise.

The EELC structure does not yet provide a role for Tribal governments. However, recognizing that Tribes are partners in environmental protection, the EELC will explore how to provide for Tribal involvement in E-Enterprise governance. Certain provisions, including explicit membership on the EELC, may require an amendment to this Charter to include representation of Tribes.

The EELC may occasionally need additional expertise or perspectives beyond that of the regular membership. In such cases, they may invite subject matter experts to participate in meetings.

The following diagram depicts the E-Enterprise Governance Structure:

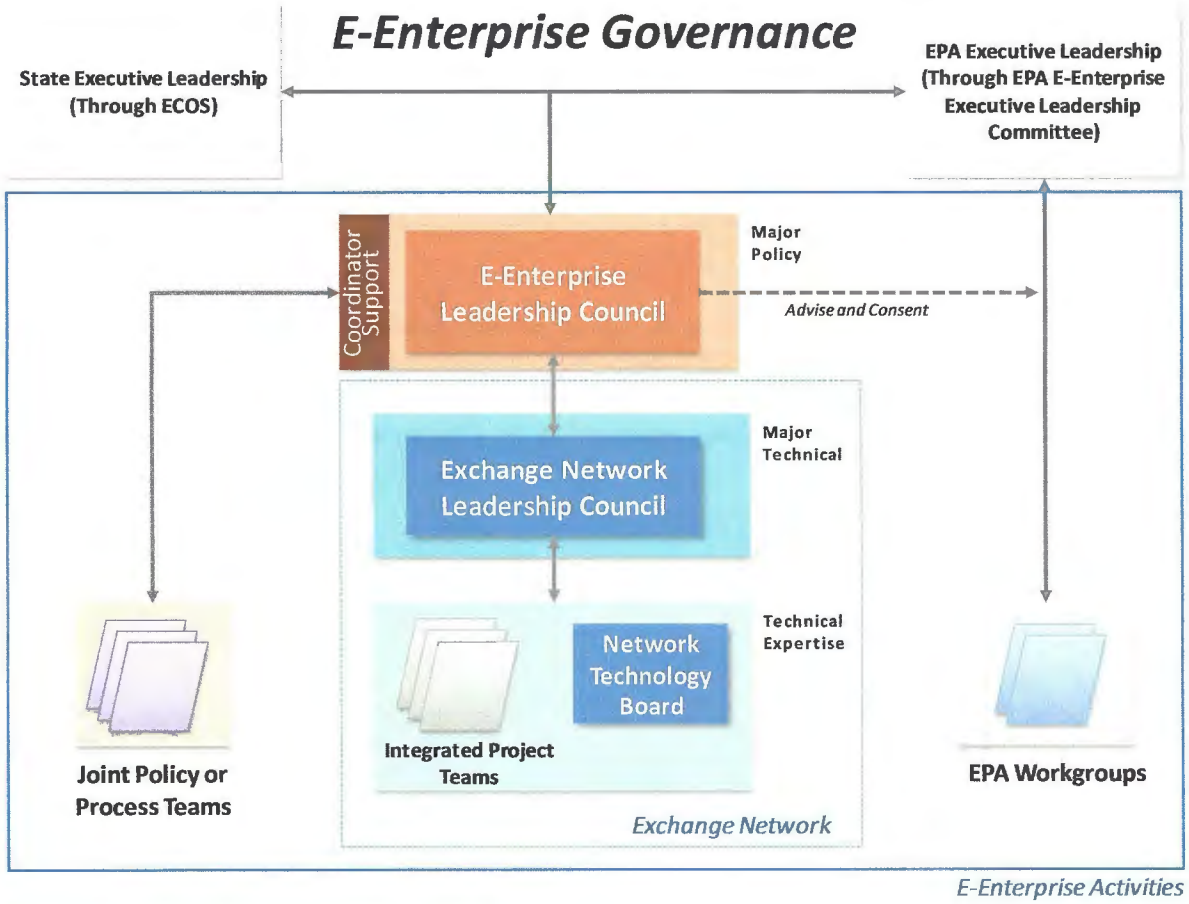


Figure 1: E-Enterprise Joint Governance Structure

Managing Principles

Decision Making and Voting Procedures

To the extent practicable, the EELC will strive for consensus decision making and will follow a formal voting process only when a consensus cannot be achieved. It is anticipated that instances in which voting is necessary will be rare. The voting procedures described here seek a balance between preventing a small minority of dissenting opinions from impeding progress and ensuring that more than a simple majority is required to make decisions. The voting procedures are:

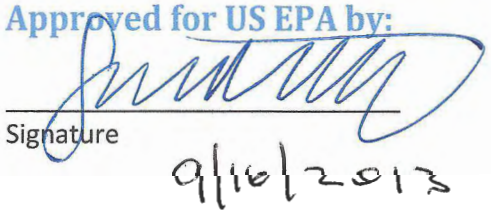
- Three-quarters of the full membership (rounded up to the nearest whole number) will constitute a quorum. The quorum must include one of the co-chairs and at least five EPA and five State members.
- Approval of a recommendation or decision will require an affirmative vote by three-quarters of the full membership.
    - For recommendations on project proposals the EELC will recommend, recommend with reservations, or not recommend.
- EELC members will not be allowed to designate an alternate or to give proxies for voting purposes. An EELC member may ask an individual to sit-in on EELC discussions to report back to the member but will not be counted towards quorum.
- The co-chairs maintain the right to:
    - Postpone a vote
    - Recess a meeting or conference call to enable State or EPA caucusing prior to voting
    - Request that votes be conducted by email following discussion in a meeting or conference call so that all voting members are able to participate
    - Ask that the meeting minutes contain a brief statement by one or more EELC members who voted 'no' to explain their opposition.

Update Procedures for this Charter and the Operating Guidelines

Additional operating guidelines for the EELC are documented in the EELC Operating Guidelines for 2014-2015, included as an appendix to this Charter. The EELC will biennially revise and adopt a new version of the Operating Guidelines. These routine updates must be supported by three quarters of the members and do not constitute an amendment to this Charter.

The EELC will initiate an annual review of its Charter and seek input from the ECOS Executive Committee and EPA Executive Leadership Committee, except the first review need not be completed until 18 months from the first meeting of the EELC. Updates to the charter will be initiated by the EELC and changes to the charter will require approval of EELC members per the processes described in this Charter and then submitted to ECOS and EPA for approval.

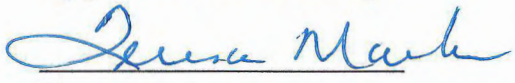
Approved for US EPA by:



Signature

9/16/2013

Approved for ECOS by:



Signature

9/16/2013

Appendix I: 2014-2015 Operating Guidelines

Meeting Guidelines

The EELC will meet a minimum of six times per calendar year and will not exceed twelve meetings per year. These meetings will be held via teleconference with web casting services utilized as necessary to share and collaborate on documents. At least one face-to-face meeting will be scheduled per calendar year to allow members to discuss topics in more depth. Conference calls will be allowed to continue without a quorum at the discretion of at least one co-chair. However, no final decisions can be made in the absence of a quorum. The Coordinator has the responsibility of ensuring that meeting minutes are produced in a timely fashion and made available publicly.

E-Enterprise Implementation Plan

The EELC will create an E-Enterprise Implementation Plan that has a 3-5 year planning horizon. Using this document, the EELC will work with the Coordinator to develop an annual work plan for the EELC. The annual work plan must also include measures and targets for success. The Coordinator will work with the co-chairs of the Exchange Network Leadership Council (ENLC) to ensure that E-Enterprise needs are considered and addressed in the ENLC's annual work planning process.

Member Expectations and Term Limits

EELC members are expected to attend most calls and meetings. Members may send non-voting designees to meetings when necessary and the expectation is that the designees are 'up to speed' on the EELC agenda. Designees for co-chairs will not assume the role of co-chair. Member term limits will be determined independently by the States and EPA and will recognize both the steep learning curve faced by new members and the importance of maintaining some continuity in membership to ensure that the EELC retains institutional knowledge and momentum.

E-Enterprise Coordinator

The E-Enterprise Coordinator function is to support the EELC, manage the work portfolio of the entire governance structure, and fully manage issues as they work their way into and through the governance structure. The role of the E-Enterprise Coordinator is analogous to that of the successful Exchange Network Executive Coordinator position.

The Coordinator's functions will be fulfilled at a minimum by one fully assigned individual. The Coordinator reports to the EELC and is expected to provide an independent voice to discussions and be an advocate for the E-Enterprise initiative. The Coordinator will coordinate and manage the work done between meetings by staff and resources as directed by the EELC. The staff and resources available to the EELC include issue-specific "Joint Policy or Process Teams" or individual subject matter experts who are tasked by the EELC to prepare materials. These policy teams will be composed of members, from both the States and EPA, who have specific expertise.

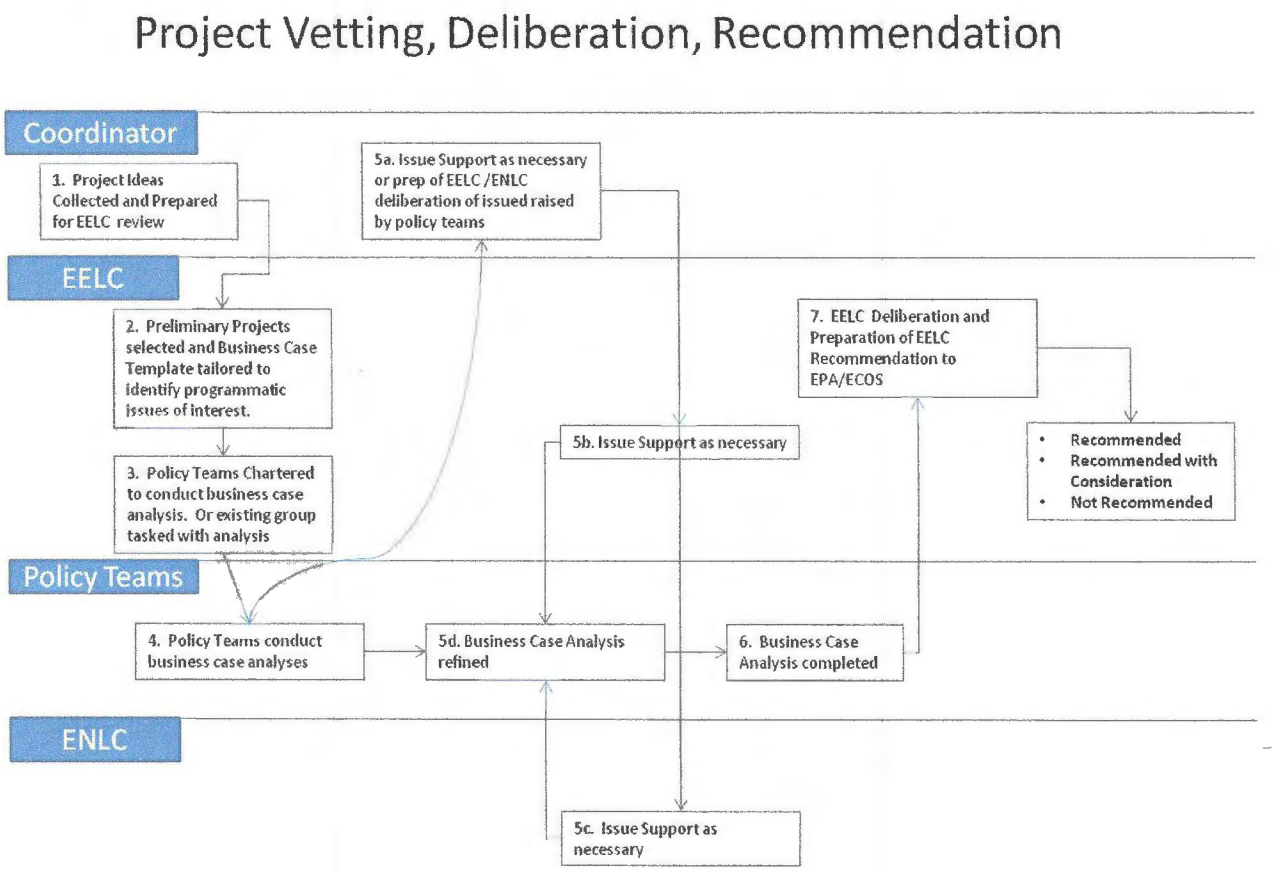
The E-Enterprise Joint Working Group will initially determine how to staff the Coordinator function and subsequent decisions regarding the Coordinator will become the responsibility of the EELC. Staffing options may include an EPA or ECOS contractor, existing manager from a state or EPA, an ECOS employee, or some combination of these. Regardless of the mechanism to hire the Coordinator, the job description and responsibilities must remain the same.

Communications

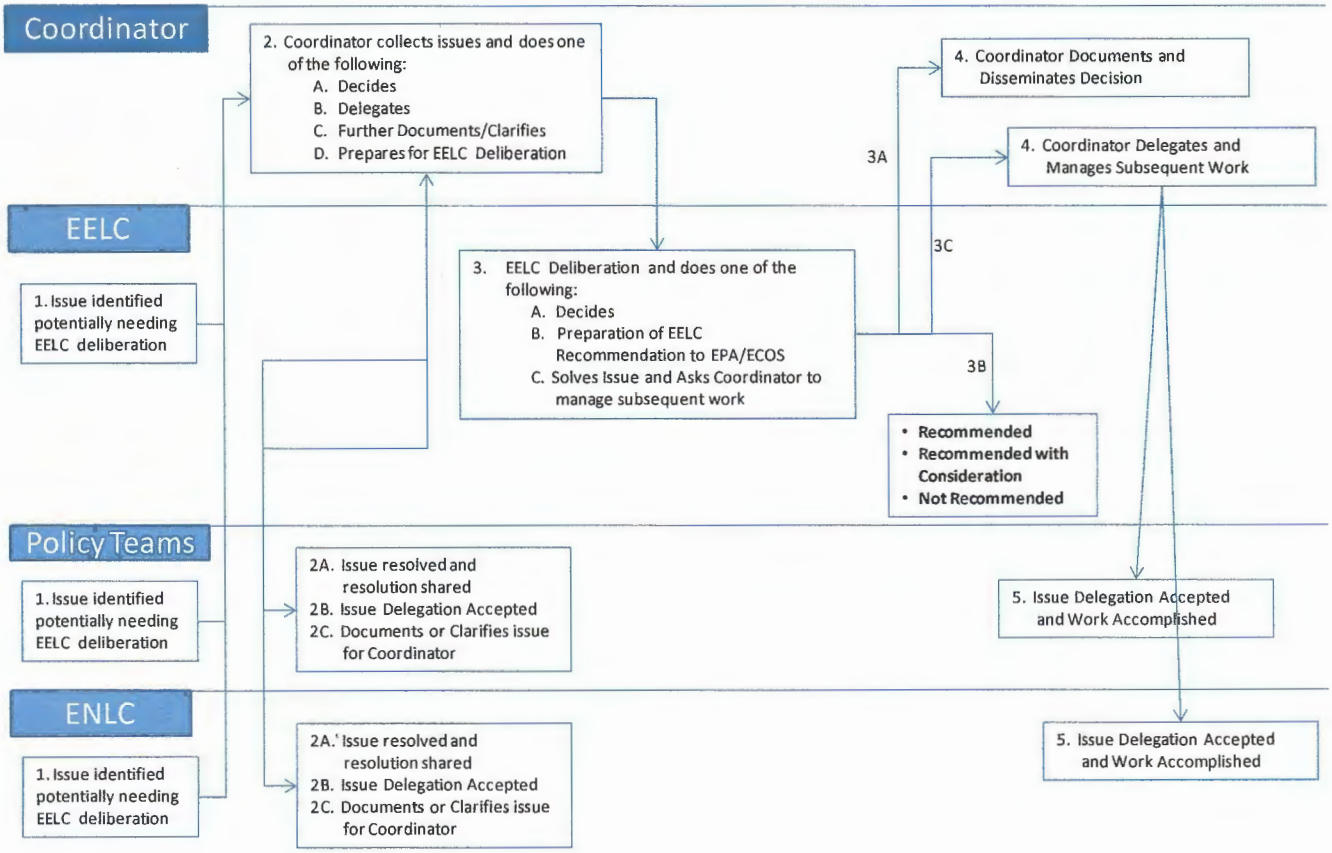
Communication is an essential function of the EELC. The EELC must actively promote E-Enterprise and widely disseminate the outcomes of its deliverables. The E-Enterprise Coordinator will be responsible for maintaining a list of communication priorities and managing the outreach responsibilities of the EELC.

Workflow

The following diagrams describe two types of EELC workflows. These workflows specify sequence and roles and responsibilities for the Coordinator, EELC, Joint Policy or Process Teams, and the ENLC. The workflows presented here should not be seen as holding the EELC to strictly following the diagrams in performing either the project vetting/deliberation/recommendation function or the issue resolution function. Rather, they represent the wisdom and experience of the E-Enterprise Joint Working Group and are intended simply to provide guidance and direction to the EELC as the group works to carry out its responsibilities.



Issue Resolution



Appendix II: Acknowledgments

The Working Group would like to explicitly acknowledge the contribution of Ira Leighton, Deputy Regional Administrator, EPA Region 1, who passed away during the development of this Charter. Ira provided inspiration and leadership and was the catalyst for the formation of the State-EPA E-Enterprise Working Group. Ira's steadfast belief that E-Enterprise could only be successful through a meaningful partnership between States and EPA is now indelibly etched in the foundation of this initiative, including his recognition of the vital role of concerted and ongoing communications among and between all the involved and interested parties.

Also, this Charter and the E-Enterprise joint governance structure, along with the other documents developed to implement the E-Enterprise for the Environment initiative, reflect the collaborative spirit and the hard work and dedication of all of the individuals who participated on the Joint Working Group and/or one of the four teams – Governance, Blueprint, Business Case and Communications, as listed below:

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