

**PATHWAYS TO STATE POLLUTION
PREVENTION REGULATORY
INTEGRATION:

THE SPRINT COMPENDIUM**

**Jeanne Herb
Allen White
Susan Helms**

**Tellus Institute
11Arlington Street
Boston, MA 02116-3411
Tel: 617/266-5400
Fax: 617/266-8303**

Acknowledgements

This report, the result of Phase I of the State Pollution Prevention Regulatory Integration Initiative (SPRINT) Project, was made possible through the generous support of the Pew Charitable Trusts and Heinz Endowments. Special thanks to Shelley Hearne of Pew and Andrew McElwaine of Heinz for their guidance throughout the project.

The authors gratefully acknowledge the many individuals in state environmental agencies, too numerous to mention individually, who shared their experiences and visions of how prevention can be firmly integrated into day-to-day agency operations. Their contributions, and those of our donors, were critical to building a strong foundation for Phase 2 of SPRINT—Pilot Tests with State Partners. Special thanks also are extended to Julie Abcarian, Parry Burnap, Meredith Hill, Stacy Richardson, and Tony Sasson for their efforts in developing partnerships for SPRINT-Phase 2. We also greatly appreciate the feedback provided by our Steering Committee, Christopher Daggett, Daniel Greenbaum, and G. Tracy Mehan. Finally, we thank the following for their invaluable guidance in various aspects of Phase 1: Steve Anderson, Anne Berlin-Blackman, Ken Geiser, Tim Greiner, Bob Kerr, Jack Luskin and from U.S. EPA, John Glenn, David Kling, Sheila Canavan, Lena Ferris and Julie Shannon.

CONTENTS

Acknowledgements	1
I. INTRODUCTION.....	3
Background.....	3
P2 in Retrospect.....	4
The SPRINT Imperative	5
Re-energizing P2.....	6
II. SPRINT APPROACH TO REGULATORY INTEGRATION	9
The IP Compendium.....	9
State Partnerships	14
III. SPRINT REGULATORY INTEGRATION CRITERIA	15
❖P2 Definition	18
The Importance of a Clear P2 Definition	18
Developing a Clear and Measurable P2 Definition.....	19
Examples of P2 Definitions.....	20
Applying P2 Definition in Regulatory Integration.....	23
❖P2 Baselines and Metrics	24
The Importance of P2 Baselines and Metrics	24
Developing P2 Baselines and Metrics.....	25
Applying P2 Baselines and Metrics in Regulatory Integration.....	28
❖Agency Resources	30
The Importance of Sufficient, Earmarked Funding	30
Developing Approaches for Funding P2 Regulatory Integration.....	30
❖Institutional Change.....	32
The Importance of Incorporating Institutional Change into Regulatory Integration Efforts.....	32
Developing Regulatory Integration Approaches that Result in Institutional Change.....	33
Applying Institutional Change Considerations in Regulatory Integration.....	34
❖Multimedia Considerations	36
The Importance of Considering Multimedia Impacts as Part of P2 Regulatory Integration.....	36
Developing a P2 Regulatory Approach that Considers Multimedia Impacts	37
Applying Multimedia Considerations in P2 Regulatory Integration Efforts	38
❖Evaluation	39
The Importance of Evaluating P2 Regulatory Integration Efforts	39
Developing an Evaluation Component	40
Applying the Evaluation Component.....	41
❖Environmental Cost Accounting	43
What is Environmental Cost Accounting?	43
The Importance of ECA in P2 Regulatory Integration.....	45
Developing Regulatory Integration Approaches that Incorporate ECA	46
Applying ECA in Regulatory Integration Efforts	47
IV. INNOVATIVE PRACTICES	49

Figure 1: A History of Pollution Prevention

Figure 2: SPRINT Process

Figure 3: Targets in State Environmental Agencies for P2 Regulatory Integration

Figure 4: SPRINT's Seven Criteria

Figure 5: Anatomy of an IP

Table 1: Typical P2 Effort vs. SPRINT Strategy for Implementing IP 31

Table 2: Examples of Costs to Consider in Applying ECA Tools

I. INTRODUCTION

Background

More than two decades have passed since the enactment of the nation's main environmental statutes. The good news is that these laws have, in general, resulted in cleaner air, water and land. The mixed news is that these laws and, more so, the regulatory infrastructure developed to implement them, has resulted in a prescriptive, control-oriented foundation that is ill-equipped to bring industry to the next level of environmental protection while contributing to the economic vitality of the nation.

The shortcomings of the current environmental regulatory regime include:

- An approach that is based on defining highly prescriptive approaches for achieving compliance. Such an approach results in a “compliance first” mentality in industry, government and the public and, in doing so, curtails creative efforts to achieve compliance in alternate ways, including prevention.
- An approach that assumes that the standards on which the prescriptive approaches are based assures environmental and public health protection. Yet, with new knowledge often comes the identification of environmental and public health risks that previously were not factored into the development of an environmental standard. Existing pollution control approaches assume that safe standards can be set with confidence, while prevention methods simply assume that “less is better.”
- An approach that demands that industry invests significant capital for pollution control equipment. This makes environmental compliance a “cost,” not an asset. Once a company invests significant capital in a control technology to achieve compliance, it has little incentive to reduce chemical use or generation through process changes, materials substitution or other prevention approaches.
- Neglect of pollutant shifting from one environmental media to another ignoring the ultimate fate for many pollutants including those that are the most persistent, bioaccumulative and toxic.
- An approach that, in the end, does not provide the greatest level of environmental protection. The environmental management hierarchy defined in federal law recognizes that preventing the use and generation of toxics is the most effective way to protect environmental quality in the long term. The single medium, end-of-pipe emphasis of the current regime does not systematically ensure that prevention alternatives will be sought.

Addressing these shortcomings in order to bring about a pollution prevention (P2) ethic is a formidable challenge facing business, the public interest community and state environmental agencies today. For the states, the outstanding question is whether agencies have the tools they

need to address this challenge in a way that results in a comprehensive and lasting prevention culture in core environmental regulatory programs.

P2 in Retrospect

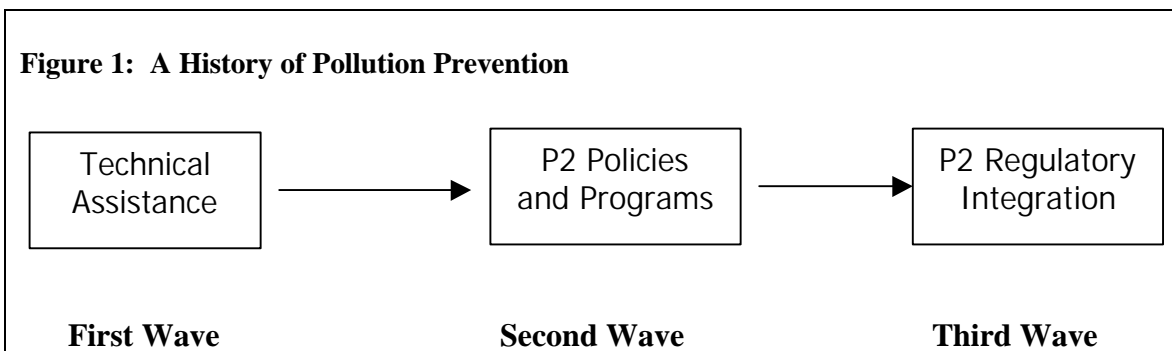
Beginning in the mid-1980s, awareness began to emerge of the impediments to achieving industrial P2 under the existing environmental regulatory structure. Early P2 studies, including INFORM's *Cutting Chemical Wastes*, pointed to the enormous opportunities for achieving significant reductions in chemical use and waste generation while reaping significant financial rewards. This finding was affirmed by other work, including the 1986 Office of Technology Assessment (OTA) study *Serious Reduction of Hazardous Wastes*, which pointed to the substantial regulatory obstacles which stood in the way of achieving these rewards.

These early studies spurred a *first wave* of P2 programs at the state level (Figure 1). These programs, in general, were voluntary initiatives to assist industry in realizing profitable prevention options. Many states, on the premise that technical information was the principal impediment to accelerating P2, created Technical Assistance Programs (TAPs) which provided free, non-regulatory assistance to industry to identify P2 opportunities. The positive outcomes of these technical assistance programs were bolstered by the eye-opening results of the initial reports under the Toxics Release Inventory in 1988. For the first time, the public began to fully appreciate the enormous volume of pollutant releases at the facility, state, regional and national level. The combination of convincing economics and public demand for more aggressive pollution reduction formed a potent driver for business to give P2 a serious look.

While the economic case for P2 became increasingly evident, the sluggish pace of P2 progress by the early 1990s presented an apparent contradiction. Why, if the economics were persuasive, were profit-driven firms unwilling to implement P2 options in their own self-interest? Work by Tellus Institute and others argued that, in part, the explanation lay in the combination of conventional cost accounting methods that obscure the true costs of chemical use and wastes. Without a transparent picture of the costs, managers will systematically under-invest in P2 improvements. At the same time, the continued dominance of technology-based, end-of-pipe regulations continued to drive business decisions toward single-medium, pollution control compliance.

In response to a desire to further advance the gains of first-wave efforts, a *second wave* of P2 programs emerged. This second wave sought to move industry towards a prevention-based mode through enactment of new government policies and regulations—mostly P2 planning and reporting requirements. During this second wave, the federal Pollution Prevention Act and counterparts in several states were enacted. In some cases, these laws sought to lay the foundation for development of a systematic transformation of the environmental regulations from pollution control to P2.

As we survey the current P2 landscape in the late 1990s, it becomes immediately evident that P2 has by and large stalled in its evolution toward becoming the dominant regulatory ethic and framework. A *third wave*, in which P2 would be fully integrated into core environmental regulatory programs, simply has not occurred. P2 has failed to permeate agency operations to the point of achieving a transformation of core regulatory programs from a pollution control to a P2 foundation.



The SPRINT Imperative

Why has implementation of P2 stalled at the state level? How can the P2 evolution (or revolution, in the words of some¹) be reinvigorated to move into a third wave? To the credit of numerous states, many P2 regulatory innovations have been tried and/or implemented. Various agencies have P2 components in core regulatory programs, including compliance, permitting, standard setting and planning. Yet, existing integration efforts at the state level fall short of bringing about a systemic and lasting change for several reasons. Principal among these are:

- Most state agencies have not developed a *comprehensive* P2 regulatory integration agenda and, instead, focus in piecemeal fashion on a particular aspect of environmental regulation. States that have strong P2 regulatory integration efforts in permitting, for example, may have no efforts underway in enforcement.
- Most state agencies have not addressed the underlying *drivers* of core regulatory programs such as organizational structure, workplans, regulations, and job descriptions. As a result, P2 regulatory integration initiatives tend to treat the symptoms rather than the causes which will bring *systemic* change.
- Many P2 regulatory integration initiatives fail to be based on a defined structure with *quantitative* metrics. Instead, they often include vague P2 definitions, limited specific components and qualitative measures. Without a sound P2 structure and metrics, many initiatives result in practices that are, in the end, not true prevention.

What is needed at the state level, first and foremost, is the development and implementation of clear and comprehensive P2 regulatory integration agendas that are:

Comprehensive - Span all program areas and set clear priorities;

Quantifiable – Ensure that the results of specific integration practices are measurable;

¹ Hirschhorn, Joel S. “Why the Pollution Prevention Revolution Failed-And Why It Ultimately Will Succeed,” *Pollution Prevention Review*, Winter 1997, pp. 11-31.
Geiser, Ken. “Can The Pollution Prevention Revolution Be Restarted?” *Pollution Prevention Review*, Summer 1998, pp. 71-80.

Systemic – Change the underlying determinants of agency and individual behavior to ensure that P2 regulatory integration efforts become firmly implanted in agency culture and practice.

Developing effective P2 regulatory integration agendas is a formidable challenge for state agencies. In this era of government downsizing, many are struggling to respond to the immediate demands of the public and the regulated community, “fighting fires” in reaction to the “issue du jour.” Internal resistance to change is strong, and 25 years of end-of-pipe, medium-by-medium regulation dies hard. Moreover, agencies are without guidance on how to develop comprehensive P2 regulatory integration agendas. Even those that want to are not sure how to proceed.

Re-energizing P2

To address this challenge, Tellus Institute launched the State Pollution Prevention Regulatory Integration Initiative (SPRINT) in September 1997. Phase 1 planning of SPRINT, made possible by the financial support of the Pew Charitable Trusts and the Heinz Endowments, was completed in summer 1998. Phase 1 benefited from the expertise of a Steering Committee comprised of Christopher Daggett, former Commissioner of the New Jersey Department of Environmental Protection; Daniel Greenbaum, former Commissioner of the Massachusetts Department of Environmental Protection; and G. Tracy Mehan, Director of the Michigan Office of the Great Lakes and the Michigan Great Lakes Protection Fund.

SPRINT’s goal is to assist state agencies in transforming their medium-specific, pollution control regulatory infrastructures to multimedia pollution prevention. Its design, outlined in Figure 2, is based on several key assumptions:

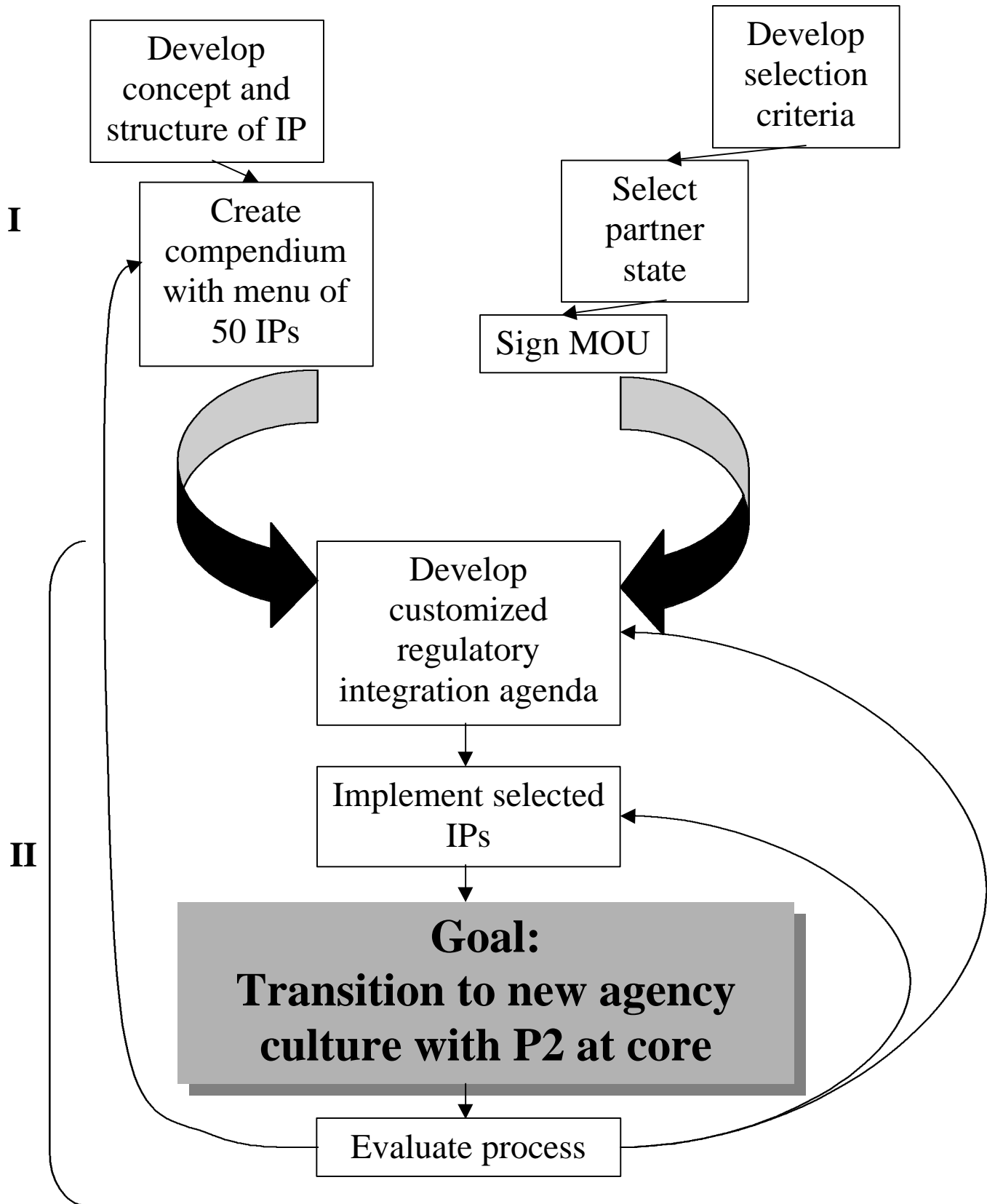
- That the current environmental statutory framework provides considerable flexibility to integrate P2 into core regulatory programs. SPRINT is designed to exploit this flexibility while recognizing that some genuine statutory and regulatory obstacles to P2 integration may require statutory or regulatory change.
- That state agencies which want to fully integrate P2 into core regulatory programs lack the tools to do so.
- That the development of comprehensive and lasting P2 regulatory integration agendas cannot follow a cookie-cutter one-size-fits-all approach. Instead, customization and tailoring to account variations in agency P2 progress, resources and organizational history are essential to SPRINT’s success.
- That while ongoing regulatory integration efforts underway in states provide some models, there also is a wide array of untested innovative practices (IPs) that merit attention and experimentation.
- That the existing network of state environmental agencies is a ready-made vehicle for leaning and adaptation of IPs across agencies.

Based on these assumptions, SPRINT’s design involves identifying and documenting current and promising IPs and working collaboratively with partner states to develop integration agendas based on selected IPs. In doing so, SPRINT is designed to support partner states with both technical and organizational change expertise to achieve its P2 transformation goal.

As depicted in Figure 2, during SPRINT-Phase 1, Tellus developed this Compendium of P2 Innovative Regulatory Integration Practices based on a review of P2 regulatory integration efforts underway in states. Also, during Phase 1, Tellus is entering into Memoranda of Agreement with several states. These state agreements outline the partnerships between Tellus and these states that will be underway in Phase 2. During Phase 2, Tellus will work cooperatively with the partner states to develop and implement long-range, customized P2 regulatory integration agendas based on the Innovative Practices contained in this Compendium. The ultimate goal of the Tellus-state partnerships is to transform the underlying culture and operations of the agencies to be P2-based.

At this juncture, SPRINT is limited to P2 in relation to industrial use, generation and release of regulated toxics and pollutants. However, we recognize that regulatory integration is relevant to other areas of state regulatory activity such as agricultural and non-point source P2. While industrial toxics are the focus of Phases 1 and 2, subsequent phases may well embrace these equally important opportunities for achieving P2 regulatory integration.

Figure 2. SPRINT Process



II. SPRINT APPROACH TO REGULATORY INTEGRATION

SPRINT's strategy is to foster P2 regulatory integration to the point where P2 becomes an invisible, yet pervasive, element in all state environmental policy, planning, permitting, enforcement, and reporting activities. To implement this strategy, four linked objectives will be pursued:

1. Expand the capability of state agencies to transform core, single-medium regulatory programs into quantifiable P2-based programs
2. Help agencies structure multimedia and regulatory reinvention efforts that have P2 as their fundamental design component
3. Identify and work to surmount specific obstacles to agencies' abilities to transition to a P2-based regulatory framework
4. Build capacity of NGOs to become active and productive voices in state agency efforts to integrate P2 into core regulatory programs

The kind of transformation SPRINT envisions is neither simple nor easy. Indeed, implementation of IPs in and of themselves will not result in a fundamental change in the ethic that sustains the current single-medium, pollution control infrastructure. Rather, IPs can serve as important tools, as catalysts to rethinking how a P2 transition might occur. Without such introspection, IPs will simply be a series of individual, disjointed initiatives lacking a grand vision and coherent direction. Instead, using IPs to attend to both the strategic and the operational aspects of P2 will ensure durable P2 integration. Both are integral to SPRINT's collaboration with state partners during Phase 2.

While state partnerships will provide a proving ground for integration experiments, they also will be critical sources of insights into fashioning an NGO role in the integration process. As part of Phase 2, SPRINT will develop a training curriculum to provide the Non-governmental Organization (NGO) community with greater understanding of P2 regulatory integration. This will enable NGOs to become constructive and active participants in implementing IPs. The training curriculum will be piloted with local NGOs in partner states.

The development and implementation of IPs assumes that there exists considerable flexibility in the current regulatory structure to allow for P2 regulatory integration. Work with partner states will provide a valuable opportunity to identify specific statutory and regulatory obstacles to implementing IPs. If federal impediments are found, it may also lead a state to pursue agreements with EPA to allow for regulatory flexibility or change. The recently signed "Innovations Agreement" between EPA and the Environmental Council of the States (ECOS) may provide such a vehicle.

The IP Compendium

IPs lie at the heart of SPRINT. To shape these critical ingredients of the SPRINT program, we identified *targets* of state agency operations that lend themselves to P2 regulatory integration (Figure 3). Many agencies already have undertaken selected integration initiatives targeted at these aspects of their operations. A key SPRINT objective is to assist agencies in expanding, linking, and synergizing integration efforts across all of these areas of operation.

Figure 3

Targets in State Environmental Agencies for P2 Regulatory Integration:

1. *Agency culture and operations (Cul)*
2. *Financial operations and incentives (\$)*
3. *Standard setting and rule development (Rul)*
4. *Facility Planning (FP)*
5. *Permitting (Per)*
6. *Compliance and Enforcement (Enf)*
7. *Reporting (Rep)*

To develop a set of integration tools, we identified *seven criteria* by which to structure IPs. These criteria reflect the attributes that make P2 regulatory integration efforts comprehensive, quantifiable and systemic.

Section III contains an in-depth discussion of the seven criteria. It is *strongly* recommended that state agencies considering implementation of the IPs carefully review Section III first. Collectively, the seven are the threads that bind the IPs into a unified fabric for pursuing an integration strategy. Section III provides essential background justification for criteria selection and application.

The first step in developing IPs was a search for current state integration practices. This was developed through a review of electronic information, reports and discussions with state representatives. The results of this search were compiled in a

database according to the state category of IP. The database is not an exhaustive compilation of all P2 regulatory integration activities in the states. Rather, it is a selective list of those which, in our best judgement, represent a cross-section of current activities. The database lists the name of the state environmental department, the name of the office responsible, and the name of the

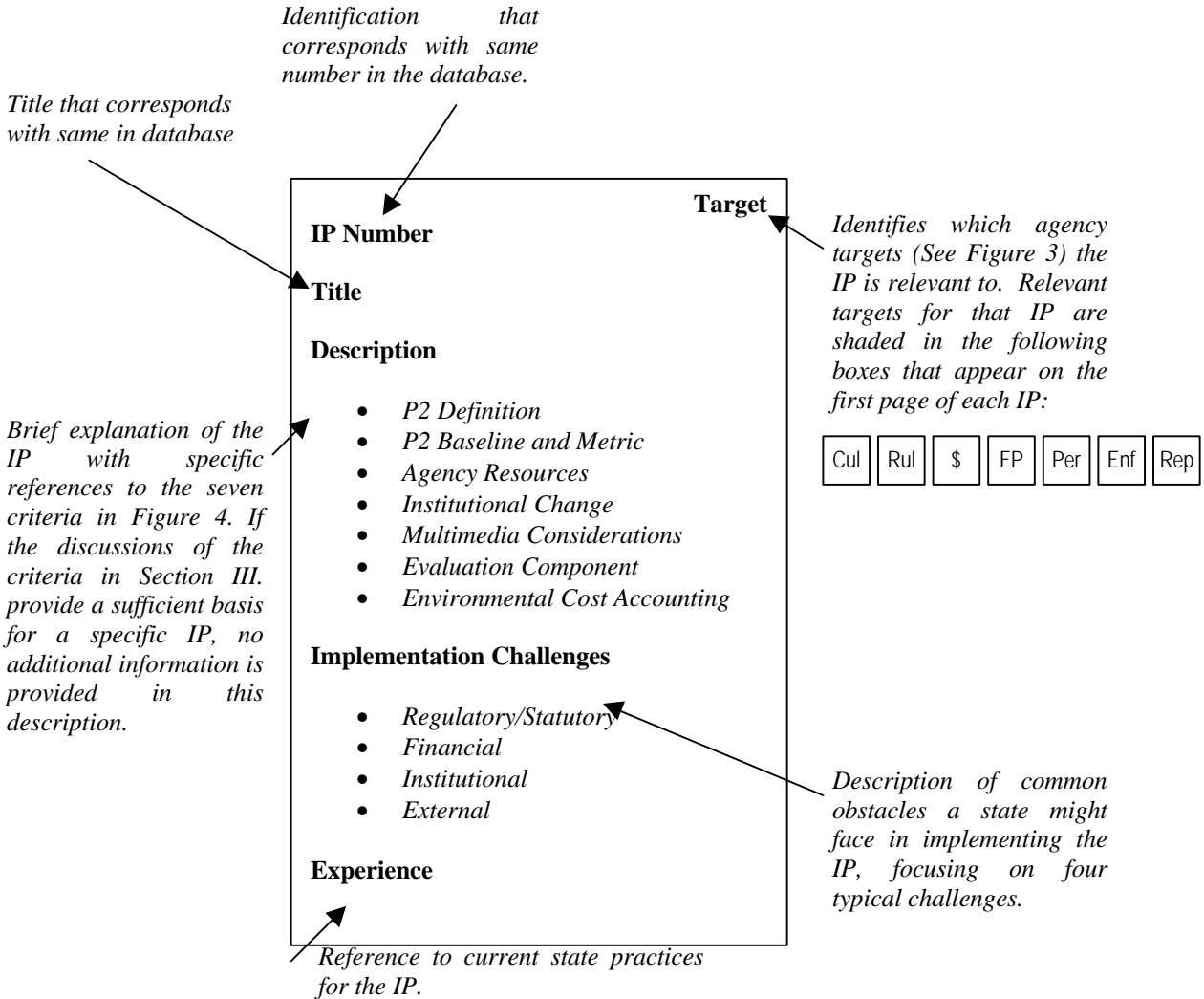
Figure 4

SPRINT's Seven Criteria:

<i>P2 Definition</i>	<i>Ensuring that the definition of P2 forms the basis for P2 regulatory integration IPs</i>
<i>P2 Baseline And Metric</i>	<i>Developing meaningful tools that measure, in quantifiable terms, the P2 outcome of an IP</i>
<i>Agency Resources</i>	<i>Ensuring that sufficient funds are available for P2 regulatory integration</i>
<i>Institutional Change</i>	<i>Changing management, regulatory and cultural factors of core regulatory programs so IPs become part of standard operating procedures</i>
<i>Multimedia Considerations</i>	<i>Developing IPs within single medium programs in a way that reflects multimedia issues. Also, building multimedia approaches into new initiatives outside medium-specific programs.</i>
<i>Evaluation</i>	<i>Designing P2 regulatory integration IPs in a way that allows for regular evaluation</i>
<i>Environmental Cost Assessment</i>	<i>Integrating consideration of the financial benefits of P2 into P2 regulatory integration efforts</i>

program or initiative. Each of the 206 examples is described briefly, and the source for the information is noted. The examples are linked to the list of IPs, so that a user may search for cases by which IPs they are associated with. An electronic version of this database is available upon request.

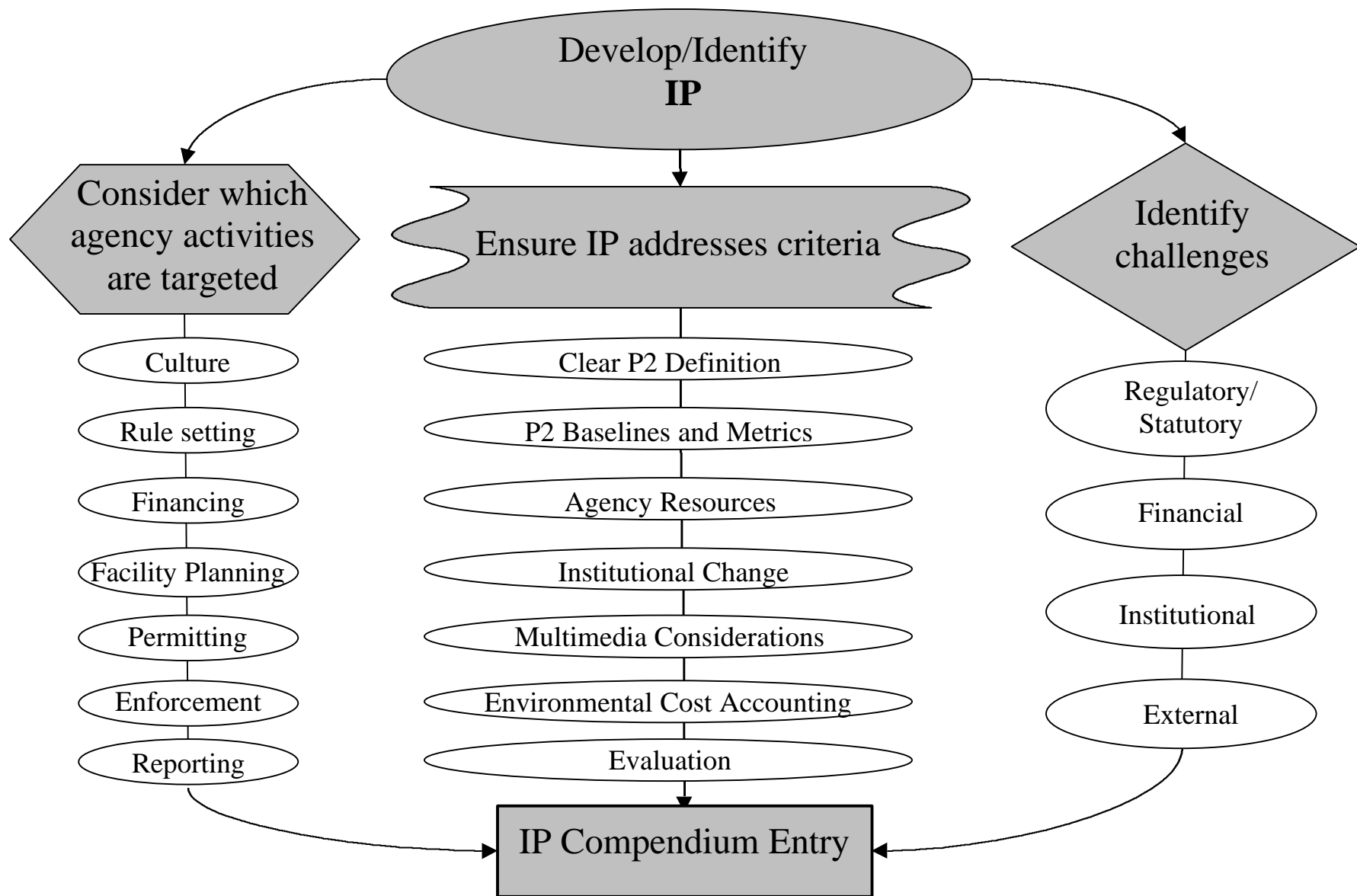
The search for current state practices led to the identification of the 50 IPs on which this Compendium is based. The IPs reflect a wide diversity of practices in terms of content, frequency, and track record. The 50 IPs are described in Section IV of this Compendium and each IP appears in a standard format as follows:



Note that the collection of 50 IPs in the Compendium is more than a consolidated catalog of existing P2 regulatory integration efforts in the states as illustrated in Figure 5. We chose to go beyond current practices because we believe current practices do *not* capture all potentially promising IPs. For some of the practices, such as Supplemental Environmental Projects (SEPs), there is considerable state experience and documentation. For other, equally promising IPs, little or no state experience is identifiable. Still other practices, such as facility-level permit limits, are in experimentation by states but not necessarily for specific P2 purposes. As we culled through state activities, we took the liberty of reshaping, amending, and otherwise changing integration

practices in a way that would yield a complete, and hopefully provocative, final compendium of IPs.

Figure 5. Anatomy of an IP



State Partnerships

The IP Compendium provides the foundation for Tellus' partnerships with states in SPRINT-Phase 2. During Phase 2, we will be working with 3-4 partner states to develop and implement P2 regulatory integration agendas. Each state's agenda will be developed by determining which of the IPs will provide the most durable form of regulatory integration. Our vision is set in motion on the culture change in self-sustaining fashion using a first round of IPs to trigger and fuel the change process.

In February 1998, Tellus began its recruitment of potential state partners. Our criteria for state partners were as follows:

- Upcoming changes or P2 initiatives in the agency that provide a platform for SPRINT's agenda
- Demonstrated commitment to the concept of P2 regulatory integration
- Demonstrated interest in environmental regulatory innovation
- Position to serve as a mode of innovation that will influence other states
- A diverse industrial base
- Geographic diversity.

An initial screening yielded follow-up discussions with seven states that demonstrated interest in a possible partnership. As of August 1998 follow-up discussions were held with four of the seven states yielded verbal and/or written commitments to a Memorandum of Agreement by early Fall 1998.

III. SPRINT REGULATORY INTEGRATION CRITERIA

This chapter contains detailed discussions on the seven criteria that were determined in SPRINT to significantly contribute to the development of comprehensive, quantifiable, and systematic P2 regulatory integration.

The seven criteria are as follows:

1. P2 Definition
2. P2 Baseline and Metric
3. Agency Resources
4. Institutional Change
5. Multimedia Considerations
6. Evaluation
7. Environmental Cost Accounting (ECA)

To illustrate how these criteria shape an IP into an instrument for P2 regulatory integration, Table 1 compares how a sample practice evolves under typical P2 conditions versus evolution under SPRINT criteria. Without these criteria, even a sound idea like providing P2 information during compliance inspections will not reach its full potential nor survive personnel changes. In contrast, adherence to the seven criteria maximizes the likelihood that a new practice will be both effective and durable, while avoiding the neglect and/or fragility that has undermined many past attempts at P2 integration.

Table 1. Typical P2 Effort vs. SPRINT Strategy for Implementing IP 31: Providing pollution prevention information to facilities through the permit application process and compliance inspections

SPRINT Criteria	Typical P2 Effort	SPRINT Approach to P2 Regulatory Integration
<p>P2 Definition – <i>Establishing or confirming a clear and measurable, source reduction-based definition of the term pollution prevention to drive the design and implementation of the IP.</i></p>	<ul style="list-style-type: none"> • Agency maintains a confusing definition of P2 that has been interpreted inconsistently by various programs. • Various programs implement this practice based on their own interpretations of P2 definition. 	<ul style="list-style-type: none"> • Prior to implementing the practice, the agency reviews and confirms a single, consistent definition of P2. • All written materials, both for internal as well as external consumption, include the P2 definition and P2 examples. • Training for staff for this IP reinforces the P2 definition.

<p>P2 Baseline and Metrics – <i>Developing numeric measures to track P2 that results from the IP. Ensuring that the measures reflect the P2 definition and are normalized to account for production level.</i></p>	<ul style="list-style-type: none"> • Staff provides qualitative outreach to facilities with no regard to P2 measurement at the facility. 	<ul style="list-style-type: none"> • Agency develops user-friendly models for numeric measures of P2. • Agency provides facilities with these models as part of their outreach effort. • Agency applies the metrics to the facilities that it visits as a pre-visit exercise.
<p>Agency Resources – <i>Ensuring that sufficient resources are earmarked for implementation of the IP to ensure its longevity.</i></p>	<ul style="list-style-type: none"> • Agency adds this practice on as an additional requirement of existing staff without changing funding or assignments. Staff views this practice as secondary and gradually ceases to implement it. 	<ul style="list-style-type: none"> • Agency renegotiates its workplan agreement with EPA to reduce number of inspections in exchange for applying the IP at a pre-determined number of facilities. • Agency redirects some federal funding in the renegotiated workplan agreement to finance this effort.
<p>Institutional Change – <i>Changing factors that drive the day-to-day operations of core regulatory programs to reflect the IP.</i></p>	<ul style="list-style-type: none"> • Agency conducts training for relevant permit writers and inspectors regarding the practice with no change to workplans, incentives, evaluation criteria or funding. Some permit writers and staff take initiative to implement the practice. Majority of permit writers and inspectors continue to conduct activities as usual while effects of training expire or dissolve. 	<ul style="list-style-type: none"> • Agency identifies: criteria for choosing facilities the practice will be applied to, standard operating procedures for its performance, and a timeline for its implementation. Agency reflects these in: workplan agreement with EPA, program workplans, staff guidance manuals and checklists, regulations governing appropriate permit and inspection programs, job descriptions, and annual evaluations. • Agency develops training for implementation of the practice to reflect the changes outlined above.
<p>Multimedia Considerations – <i>Developing the IP in a way that assesses and restricts transfers of pollutants from one environmental medium to another.</i></p>	<ul style="list-style-type: none"> • Inspectors and permit writers limit their outreach to facilities to reductions in their single-medium emissions (e.g., hazardous waste minimization outreach without consideration for transfers to air and water). 	<ul style="list-style-type: none"> • Design of program includes discussions and outreach with facilities to promote assessment of multimedia impacts. • Permit conditions modified to reduce or eliminate cross-media shifts.

<p>Evaluation Component – <i>Designing the IP in a way that allows for measurement of the effectiveness of the practice.</i></p>	<ul style="list-style-type: none"> • Agency conducts no evaluation of practice. Continues to operate practice as originally conceived with individual inspectors and permit writers tailoring it as they see fit. 	<ul style="list-style-type: none"> • Agency assigns a non-core program unit to be responsible for evaluation. This responsibility is reflected in the unit’s workplan, job descriptions, and funding. • Agency conducts semi-annual evaluation including review of metrics for and a survey of facilities for whom outreach was conducted to determine if P2 was undertaken as a result of the outreach. • Agency prepares written results of evaluation and makes necessary changes to the practice and management systems as a result.
<p>Environmental Cost Accounting – <i>Designing the IP in a way that allows for the true environmental costs of P2 options to be considered.</i></p>	<ul style="list-style-type: none"> • Inspectors and permit writers limit their outreach to facilities to highly vague discussions of financial benefits of P2 without any focus on quantifiable ECA methods. 	<ul style="list-style-type: none"> • Design of program includes having discussions and outreach with facilities enable the facilities to identify true costs and benefits to this P2 practice (e.g., less hazardous waste to haul off-site for disposal, less time filling out TRI forms). • Agency quantifies to the extent possible the monetary benefits of having facilities engage in this P2 practice.

✦P2 Definition

The Importance of a Clear P2 Definition

One of the most critical elements of successful P2 regulatory integration is the establishment of a clear and measurable definition of P2. This issue has been muddled and contentious for more than a decade. Integration efforts have the potential to exacerbate this confusion unless a clear and measurable definition distinguishes P2 from traditional single-medium pollution control.

Several limitations persist in how P2 is currently defined in state environmental agencies:

- Some state agencies are bound by a statutory definition of P2. Other states have set their own agency-wide P2 definitions through rules or policy. In both types of states, even though there may be an overall P2 definition, individual programs may, in practice, apply a different interpretation of the definition. This likelihood is greater if the agency-wide definition is not clear and measurable. The result is that one agency may have several different interpretations of P2 in program operations and that these definitions may not conform to the agency definition or that of the legislature.
- Some state definitions of P2 do not draw distinctions among the various levels in the environmental management hierarchy. Rather than define P2 purely as source reduction or as the hierarchy's sequence, these states either apply definitions of P2 that: are not source reduction based; do not stipulate the preference of source reduction over other environmental management approaches; or are so broadly developed that the definition's intent is left completely open to interpretation. The result: instead of being a force to drive environmental regulatory programs up the hierarchy, the P2 definition may perpetuate continued equal treatment of the different steps in the hierarchy.
- While some states may adopt source reduction-based definitions of P2, they do not necessarily follow-up this definition with source reduction-based measurement. By having P2 measurement inconsistent with its definition, the agency may be sending a mixed message internally and externally.

A clear, measurable and source reduction-based definition of P2 serves to solidify the foundation for P2 regulatory integration efforts. This occurs by:

- Sending a clear message to staff in core programs about what is intended by P2 regulatory integration efforts.
- Distinguishing between the various levels in the hierarchy so that P2 continually drives environmental regulation up the hierarchy toward source reduction.
- Establishing a consistent understanding and interpretation of the definition of P2 within various core programs in the agency.
- Allowing for the development of metrics that measure true P2 progress.
- Setting a clear benchmark for progress that industry must achieve in order to gain certain regulatory incentives.

Developing a Clear and Measurable P2 Definition

There are several important issues for an agency to consider in developing, or clarifying, its P2 definition. First, a P2 definition needs to stipulate clearly and succinctly P2's relationship to the environmental management hierarchy. In doing so, the definition will point out that P2 is different from treatment and control which traditionally have been the focus of core regulatory programs. Second, the P2 definition needs to emphasize the *prevention* end of P2. Some state agencies have both P2 and multimedia efforts underway. While these are positive developments, some multimedia efforts may not be prevention-based. Third, the P2 definition needs to lend itself to measurement. Tracking the effectiveness of P2 regulatory integration requires monitoring whether P2 progress is a result of those efforts. By establishing a clear understanding of what the agency intends to eliminate or reduce, the definition of P2 can provide a framework for baselines and metrics to track P2 progress.

Some fundamental questions that a state agency might ask as it establishes or clarifies its P2 definition include:

1. **Is there an existing state mandate that establishes a definition or context for a definition of P2?** Even if the state does have some type of P2 definition mandate (e.g., statutory definition), it may still have the opportunity to clarify that definition or to elaborate on it in a way that stresses *prevention* and that lends itself to prevention measurement.
2. **Does the state distinguish between reductions in activity level versus true source reduction?** Many P2 definitions are problematic in that they do not stipulate how to factor production changes into measures of P2 progress. Silence on this issue implies that pollutant reductions due to production changes can be "counted" as P2. This may contradict the agency's intent, and result in the use of metrics that capture actual source reduction rather than reduction in activity levels.
3. **At what point on the hierarchy does the state place P2?** Establishing a P2 definition that clearly indicates where P2 resides in the environmental management hierarchy is an important component in regulatory integration. This allows core regulatory program staff to better understand how P2 is different from conventional end-of-pipe approaches. USEPA has made it clear that its definition of P2 is based on source reduction. Some states have adopted this approach, whereas other states have established P2 definitions incorporating treatment and control or have P2 definitions that are unclear as to what practices constitute P2. A source reduction-based definition of P2 is a first step towards refocusing core programs towards prevention. For states that have direct mandates which include treatment and control steps of the hierarchy in their definition of P2, as well as for states that have vague P2 definitions, there may be opportunities to sharpen language to stress the primacy of source reduction in the definition of P2.
4. **What programs are included by the P2 definition and included in P2 regulatory integration efforts?** To maintain focus and respect its resource constraints, SPRINT-Phase 1 limited its efforts to P2 in the area of regulated industrial pollutants. However, P2 concepts transcend areas of conventional environmental regulation and are relevant to other areas of environmental management such as solid waste, water use, energy consumption, and land use management. P2 comports closely with the larger concept of global environmental sustainability.

Nevertheless, states may consider the extent to which they may want to stretch their P2 definition. Some include natural resource conservation in their P2 definition. Others specify that industrial toxic P2 cannot result in multimedia transfers, increased toxics in products, or increased worker exposures to toxics. Still other states include broader sustainability considerations in their P2 definition.

5. **What are the practices that the agency considers to be P2?** Including references to specific technologies, in-plant practices, or other techniques that are considered P2 will make a P2 definition more straightforward. For example, a P2 definition might refer to five basic techniques of source reduction (raw material substitution, good housekeeping, process modifications, product reformulation, and product redesign). Noting specific techniques that constitute P2 in the definition also has the benefit of further illustrating for core regulatory program staff the distinction between P2 and treatment and control.
6. **What is the “terminology” that the agency wants to use to clarify specifically what “wastes” it intends P2 practices to prevent or reduce?** One of the most straightforward ways in which the agency can ensure a clear and measurable P2 definition is to include in it a term that expresses the point in industrial operations at which “wastes” are to be reduced or prevented. The Toxic Release Inventory uses the term “production related wastes” to identify a point of measurement for pollution prevention. New Jersey and Massachusetts use the terms “nonproduct output” and “byproduct” to refer to wastes generated at the source prior to recycling, treatment or storage. Finding the right term can be complicated because many of the types of terms that may logically fit already have associations with single medium regulatory programs such as wastes (solid and hazardous wastes regulated under RCRA), discharges (water released regulated by the Clean Water Act), emissions (air releases regulated by the Clean Air Act), releases (end-of-pipe losses as reported on TRI). For those states that wanted to have a term to express how P2 is different than single medium pollution control, it seemed necessary to adopt a whole new term.

In sum, a strong P2 definition for purposes of regulatory integration:

- Speaks to the issue of production changes
- Allows for quantitative measurement, possibly through the adoption of a new term for the “wastes” to be eliminated or reduced through P2
- Stresses, or is limited to, the source reduction step on the environmental management hierarchy
- Clarifies what practices are acceptable as P2

Examples of P2 Definitions

A cursory review of P2 definitions indicates that most are not clear on the first two issues above and that many state P2 definitions do include some references on the latter two issues. A representative example of this trend is the definition contained in one state’s P2 law:

Eliminating or reducing the use, generation or release at the source of environmental waste. Methods of pollution prevention include, but are not limited to, equipment or technology modifications; process or procedure modifications; reformulation or redesign of

products; substitution of raw materials; improvements in housekeeping maintenance, training, in inventory control; and closed-loop recycling, onsite process-related recycling, reuse or extended use of any material utilizing equipment or methods which are an integral part of a production process. The term shall not include any practice which alters the physical, chemical or biological characteristics or the volume of an environmental waste through a process or activity which itself is not integral or not necessary for the production of a product or the providing of a service, and shall not include treatment, increased pollution control, off-site or nonprocess-related recycling, or incineration.¹

In this case, the definition clearly indicates where P2 resides on the environmental management hierarchy by specifying what practices do and do not constitute P2. However, by not speaking to the issue of production changes, the definition leaves open the possibility of counting reductions in production as P2. In addition, while this definition does not provide a specific approach for measuring P2, it does specify that there are three points (use, generation and release at the source) at which P2 would be measured. Where this definition leaves measurement open to interpretation is whether the term “source” necessitates measurement at the piece of equipment, production process, or facility level.

Another state’s P2 definition addresses the production change issue through a reference to increased efficiency in its definition:

Source reduction and other practices (such as substitution of non-toxic materials for toxic ones, process changes and direct reuse or in-process recycling of materials) to reduce or eliminate the creation of pollutants through increased efficiency in the use of raw materials, energy, water, and other resources, or protection of natural resources through conservation.²

Another state’s approach is to include a very specific list of acceptable P2 practices to address the issue of reductions in production:

In-plant practices that reduce, avoid or eliminate the use of toxic substances, the generation of toxic constituents in wastes, the disposal or release of toxic substances into the environment or the development or manufacture of products with toxic constituents through the application of any of the following techniques:

- *Input substitution, which refers to replacing a toxic substance or raw material used in a production process with a nontoxic or less toxic substance;*

- *Product reformulation, which refers to substituting for an existing end product an end product which is nontoxic or less toxic upon use, release, or disposal;*
- *Production process redesign or modification, which refers to developing and using production processes of a different design than those currently used;*
- *Production process modernization, which refers to upgrading or replacing existing production process equipment or methods with other equipment or methods based on the same production process;*
- *Improved operation and maintenance of existing production process equipment and methods, which refers to modifying or adding to existing equipment or methods, including but not limited to such techniques as improved housekeeping practices, system adjustments, product and process inspections, and production process control equipment or methods;*
- *Recycling, reuse or extended use of toxic substances by using equipment or methods which become an integral part of the production process, including but not limited to filtration and other closed loop methods.*

However, pollution prevention shall not include or in any way be inferred to promote or require incineration, transfer from one medium of release to another, off-site or out of process waste recycling, or end of pipe treatment of toxic substances.³

Some states' definitions of P2 makes quantifiable measurement even more complicated by specifying that P2 practices need to reduce environmental and/or health hazards. Measurement of hazard reductions and/or risk is extremely difficult and, as a result, most states with this component in their definition are unable to determine whether this aspect of the P2 definition has been achieved. An example of this component in one state's definition is as follows:

Any practice which reduces the use of any hazardous substance or amount of any pollutant or contaminant prior to recycling, treatment or disposal, and reduces the hazards to public health and the environment associated with the use or release or both of such substance, pollutants or contaminants. The term "pollution prevention" shall not include or in any way be construed to promote or require substitution of one hazardous waste for another, treatment, increased pollution control, off-site recycling, or incineration.⁴

There is no one ideal definition of P2. However, a state agency that strives toward clarity in its definition takes a critical step towards effective P2 regulatory integration. Such clarity requires attention to the four considerations: changes in production, or activity level; quantitative measurement; unambiguous placement of P2 at the top of waste management hierarchy; and concrete guidance on what constitutes a P2 practice.

Applying P2 Definition in Regulatory Integration

To ensure consistent interpretation of a P2 definition, it is advisable to have an agency-wide definition of P2 to apply in each regulatory program. Once a clear, source-reduction based and measurable P2 definition is developed within the agency, efforts are needed to ensure that the definition is synthesized into P2 integration efforts. Restating the agency's P2 definition, along with program-specific examples, at every opportunity is needed to prevent individual core regulatory programs from developing their own, inconsistent interpretations of the definition. Restating and illustrating the definition of P2 in regulations, policies, and workplans conveys the message to staff that P2 is part of their program responsibilities and not a separate, unrelated initiative. The Approach section of each IP within this compendium addresses the issue of P2 Definition when appropriate. When included, this item is intended to note special circumstances or opportunities related to the P2 definition that are particular to that IP.

¹Virginia Waste Management Act, chapter 459 of the 1993 Acts of the Assembly. E-mail from Sharon Baxter, Virginia Department of Environmental Quality, May 5, 1998.

²Pennsylvania Department of Environmental Protection: "Strategic Environmental Management in Pennsylvania: New Tools for Gaining Environmental and Economic Efficiencies," September 1997.

³Illinois Toxic Pollution Prevention Act; 1989, Section 3, definitions.

⁴Oklahoma Senate Bill 956, 1994. E-mail from Dianne Wilkins, Oklahoma Department of Environmental Quality, May 4, 1998.

❖P2 Baselines and Metrics

The Importance of P2 Baselines and Metrics

What gets measured, gets managed. Measuring P2 progress is indispensable to evaluating the effectiveness of P2 programs, identifying areas for improvement, ensuring that any regulatory P2 requirements or agreements have been met, and documenting and publicizing achievements. Progress indicators also motivate action by providing recognition of success and a focal point for future action. The two common limitations of state's measurement of the P2 regulatory integration efforts are that they are often:

- Qualitative, and not quantitative
- Inconsistent with the definition of P2 that they are intending to measure

While quantitative measurement of P2 is important in general, it is particularly important in regulatory integration efforts for several reasons:

- P2 baselines and metrics provide a tangible structure to support the implementation of regulatory integration IPs. Without the ability to quantitatively measure the P2 result of an IP, P2 regulatory integration is perceived by external stakeholders, as well as core regulatory program staff, as a stand-alone, “touchy-feely” program that is unrelated to the agency's core mission. Moving P2 beyond this perspective is critical to investing core regulatory program staff integration efforts. One gap in P2 versus pollution control metrics is the P2 is measured on a “performance” basis (e.g. pounds/year) whereas pollution control is based on “concentration” or pounds per/hour. The more core programs move to performance based metrics the better P2 metrics will match core programs interests.
- Use of quantitative P2 baselines and metrics is the key vehicle to implement the agency's definition of P2. The tools the agency chooses to use in measuring P2 progress determines whether P2, according to the agency's definition of it, was achieved.
- P2 regulatory integration is often implemented by state agencies in the context of providing regulatory incentives for P2 achievement. In cases where an incentive is provided in exchange for P2 achievement, verifiable progress measurement is doubly important.
- Measurement of P2 results of individual regulatory integration efforts at industrial facilities allows for overall evaluation of the effectiveness of those efforts. Furthermore, establishing baselines and quantitative metrics for implementation of each IP establishes the data that the agency needs to evaluate its own P2 regulatory integration efforts.
- Quantitative P2 baselines and metrics contribute towards making P2 regulatory integration efforts systematic and lasting. Without tools to verify P2 progress quantitatively, P2 regulatory integration efforts can quickly become superfluous when compared to hard-and-fast regulatory requirements of core programs. By providing the ability to demonstrate P2 results systematically, quantitative baselines and metrics allow P2 regulatory integration to achieve visibility and equal standing among other elements of core program operations.

Developing P2 Baselines and Metrics

The first step in developing P2 baselines and metrics is to be certain of what to measure. If the agency does not have a clear definition of P2, efforts to measure P2 progress will be severely handicapped from the start. Individual departments and offices may measure their own P2 progress. But without a clear and consistent agency-wide definition, the result may be a collection of disconnected efforts rather than a unified strategy. Once the agency has defined P2 as discussed in the previous section, it can use this definition as the foundation for selecting metrics and baselines. For example, assuming the P2 definition focuses on source reduction, then the P2 metric should not measure end-of-pipe emission reductions. Selecting metrics and baselines that correspond with the agency's P2 definition is challenging but indispensable to the agency's efforts to develop systematic P2 regulatory integration.

In setting goals and measuring progress, an appropriate baseline is essential. The baseline is the initial state to which future changes are compared. The appropriate baseline depends on the use of the metric. If the agency is measuring the effectiveness of a particular project, the baseline should be the best available data at the start of the project. (Baseline data could be collected as the first task in the project.) If, on the other hand, the agency is measuring overall P2 progress at a facility, the baseline may either be set further in the past to capture recent changes or at a later date to take advantage of higher quality data.

Selecting metrics and baselines compatible with a P2 definition is challenging because, even with a clear definition, the agency still needs to determine:

1. *The level at which P2 is measured:* Levels at which P2 can be measured include:
 - **Individual source level.** In regulatory terms, this is the equipment level. A series of sources comprises a production process
 - **Production process level.** A production process is a series of sources, or pieces of equipment, that comprise an entire operation that produces a product
 - **Facility level.** The facility level is the umbrella level that involves measurement of the impact of P2 across the range of all operations within a facility
 - **A combination of source, process and facility level.** Depending on the type of P2 undertaken, it may be necessary to have tracking at multiple levels

For purposes of this compendium, tracking P2 above the individual facility level—e.g., sector, statewide— is considered *evaluation* of P2 regulatory integration efforts and is addressed as such in a later section of this compendium.

In addition to compatibility with a P2 definition, the choice of the appropriate level for measuring P2 also is dependent on the type of measurement already underway in the core regulatory program, and the particular P2 technologies and in-plant practices. For example, air regulation typically has a source level focus while water regulation is more facility-based. Instituting production process redesign may be measured best at the process level while intra-permit trading for P2 purposes may necessitate measurement at both the process and facility levels.

It may be advisable to utilize different levels of P2 measurement for tracking at the facility versus those used for public reporting. For example, some states' P2 Planning Programs require tracking at the production process level while public reporting of progress occurs at the facility level.

2. The basis for the P2 measurement: The agency must consider the most appropriate basis for measuring P2 for a given IP or P2 technique. Several approaches are possible, including:
- **Quantitative reductions in Use, Generation and/or Release.** At what point in the life of the chemical should measurement occur? This decision depends on the agency's definition of P2, the particular IP being implemented, and the particular P2 technique. For example, P2 associated with raw material substitution may best be tracked through reductions in chemical use. Several possible approaches to measuring quantitative reductions include:
 - **Use:** An agency may opt to measure P2 according to the use of toxics by industrial facilities (1) if the agency's definition specifically defines P2 to include reductions in use; (2) if the particular P2 technique employed is targeted at use reduction; (3) if the agency's P2 goal involves overall reductions in toxics in all environmental media, products, and occupational settings; or (4) if particular toxic substances of special concern—e.g., mercury, lead, certain solvents, or ozone-depleting substances—are the targets.
 - **Point of Generation:** An agency may opt to measure P2 at the point following creation of a toxic substance but prior to storage, treatment and recycling, assuming a source reduction-based P2 definition. The objective of measuring "production related wastes," "by-product," and "nonproduct output" in the Toxics Release Inventory (sum of all activities in Section 8), Massachusetts, and New Jersey, respectively, is to provide a P2 metric at the point of waste generation. Measurement of the point of generation in the latter two cases is complemented by materials accounting in which inputs and outputs are verified for each chemical of concern, thus providing a framework for the measurement of pollutant generation during the entire chemical lifecycle.
 - **Release:** An agency may opt to measure reductions at the point of release to the environment if its P2 definition is not source reduction-based. While this approach may provide a strict tracking according to the agency's definition, it does not permit an understanding of how much release reduction is due to source reduction versus other steps in the use and management of materials.
 - **A combination of use, generation, release:** Some agencies may define P2 according to source reduction-based practices but establish additional goals of reducing or eliminating industrial use, generation and/or release of chemicals of concern. In these situations, the agency may opt to measure P2 results at more than one point with metrics that correspond with the agency's P2 definition.
 - **Another combination approach** would be to index NPO to production, but track releases in the aggregate. This would help address increases in production that exceed P2 reductions.
 - **Implementation or installation of a specific pollution prevention technique or technology in a defined period of time:** P2 practices that are directly dependent on implementation or installation of a tangible practice or technique may benefit from tracking that the practice or technique is in place. However, it is unlikely that an agency would want to track P2 on this basis without also tracking quantitative reductions.
 - **Achievement of verifiable goals:** Goals may be contained in a Pollution Prevention Plan, permit, or a negotiated agreement. In these cases, the design of the goals or

agreement would need to specify quantitative baselines and measurement methods. This differs from specific P2 technique because, in this case, a specific technique is not necessarily identified.

- Development of a Pollution Prevention Plan: Development of a P2 Plan may be a requirement for a facility or part of an agreement with the agency. The plan may apply to a specific part of a facility's operations or to the entire facility. Nevertheless, specifying specific components that must be included in a Plan will make tracking the Plan more verifiable.
 - A combination of approaches: It is not recommended that the agency track solely on an activity basis (e.g., number of permits with P2 components, number of Supplemental Environmental Projects settled, etc.) without also tracking quantitative reductions in use, generation or release of the chemicals of concern.
3. *Time interval and "averaging period:"* This is a critical issue that is key to linking performance-based P2 metrics to enforcement-based permit metrics, particularly if the agency intends to develop a P2 performance metric that provides the facility with operational flexibility. Different limits are based on different timeframes. For example, the Intel permit RACT limit for VOC is based on a weekly average while the "Plant Site Emission Limits" are 8 tons/week and 190 tons year. If an agency added an annual P2 metric, it could create a situation in which the facility could potentially violate the RACT weekly yet meet the P2 metric. These issues are extremely complicated and need to be considered in-depth in the development of any P2 metrics.

To be credible, metrics and baselines need to be verifiable. If the agency is providing regulatory flexibility or other incentives in exchange for P2 progress, verifiable progress measurement is especially important. If the baseline and metric are not consistent with the P2 definition, it is impossible to discern whether P2 measures or pollution control are responsible for emission reductions. Credible P2 metrics and baselines have several characteristics:

- They account for cross-media shifts and other techniques that contradict the agency's P2 definition (such as on-site storage, shipment in or as product, transfer of risks to workers), particularly if the agency's definition of P2 specifically discounts these techniques.
- They are based on verifiable data, such as continuous monitoring, sampling and testing, materials accounting using best engineering estimates, process efficiency methods which may be in place at the facility for non-environmental reasons, or engineering mass balance calculations with explicit assumptions.
- They normalize for production volume so that facilities are not rewarded for reductions due solely to changes in production.
- Baselines and previous measurements are revised to account for new information. For example, a facility may use its discovery of flawed previous calculation methods as an opportunity to go back and revise earlier metrics to ensure accuracy and consistency in measurement over time.
- The agency and the facility agree in advance on the methods used to calculate and summarize the metric and baseline.
- If the metric is designed to measure the facility's compliance with qualitative requirements, the agency should specify in as much detail as possible what it expects

the facility to achieve. This provides assurances for the facility, the agency as well as external stakeholders as to what is expected from the P2 IP. For example, if the agency includes a requirement in a Supplemental Environmental Project (SEP) for the facility to develop a Pollution Prevention Plan but does not stipulate the minimum requirements of the Plan, the result may diverge from the intended objective.

Applying P2 Baselines and Metrics in Regulatory Integration

While there are common characteristics of quantifiable P2 metrics, the effectiveness of a metric may vary based on the P2 techniques, IP and core regulatory program for which P2 is measured. In some cases, an agency may have the opportunity to develop a new and ideal P2 metric. In other cases, particularly in cases involving P2 regulatory integration, the agency may develop a P2 metric to complement existing measurement tools in a core regulatory program. The advantage of this complementary approach is that the result measures both the normalized, efficiency-based result of P2 as well as the end-of-pipe environmental outcome. Complementing core regulatory program measures with P2 metrics also is valuable because it demonstrates the P2 results of regulatory integration, and it illustrates P2's environmental result according to conventional program measures. The latter can lead to greater support for P2 regulatory integration efforts by external stakeholders as well as core regulatory program staff.

An agency that may not have specific authority to institute a P2 metric, may consider different approaches, including:

- If the facility is undertaking a P2 effort as part of an agency voluntary program, negotiated agreement, or quid pro quo flexibility offer, the agency does not need specific regulatory authority. Rather, the metric can be required as a condition for program participation.
- On a broader level, all agencies collect various data under mandatory reporting requirements. If the agency lacks authority to institute additional requirements, it may be able to manipulate existing data to produce a workable, if not ideal, metric.
- The agency's general powers are a possible source of authority for instituting certain types of data collection and measurement requirements.
- The agency may establish pilot programs to test the use of metrics.

In sum, most measurement in core regulatory programs is single medium and end-of-pipe. The challenge in measuring the P2 results of regulatory integration efforts is to supplement such measurement with P2-based metrics that:

- Reflect the agency's P2 definition
- Normalize for production
- Are verifiable

Quantitative metrics provide a solid foundation to P2 regulatory integration efforts by advancing the agency's definition of P2 and by providing consistent and accurate tracking of regulatory integration's environmental results. Quantitative metrics develop support for P2 regulatory integration among core regulatory program staff and move regulatory integration away from its

“touchy-feely” image and toward an integral and durable component of core regulatory programs’ performance.

❖ Agency Resources

The Importance of Sufficient, Earmarked Funding

No factor is more important than funding in driving the day-to-day operations of a state agency. Funding is the manifestation of the agency's priorities. Without dedicated funding, P2 regulatory integration efforts are more vulnerable to becoming "add ons" to core regulatory programs or "pet projects" of individual P2 advocates in the agency. Identifying funding for P2 regulatory integration IPs is critical to ensuring lasting P2 regulatory integration into core programs.

Developing Approaches for Funding P2 Regulatory Integration

A state agency can tap various sources of funding that a state agency can tap for P2 regulatory integration purposes:

- New revenue from state general appropriations
- New revenue from agency fees, penalties, etc.
- New grant funding from federal sources
- Reallocation of funding from core regulatory programs
- Redirection of funds currently allocated for non-core P2 programs
- Use existing funding and change the work of core programs

In times of agency downsizing, prospects are dim for garnering new revenue for P2 regulatory integration purposes. However, a few agencies have developed initiatives to seek new sources, for example, support for special integration initiatives. Agencies intent on developing a comprehensive initiative to adopt a long-range P2 regulatory integration plan need not discount the possibility of pursuing new funding.

Absent new funds, agencies need to rely on approaches to redirect existing funding. This is always a contentious approach to funding new initiatives, even if they are in the same program, because it involves redirecting funds from efforts that are already underway. Redirecting funds from other P2 efforts poses its own set of problems since P2 efforts in most state agencies are sorely underfunded. Several state agencies have begun testing approaches of renegotiating work plan agreements with EPA and using Performance Partnership Agreements under the National Environmental Performance Partnership System as vehicles to systematically reallocate existing funds to P2 regulatory integration. If carefully planned, these efforts may offer the most promise for long-term funding of P2 regulatory integration.

Reallocating existing funds for P2 regulatory integration purposes may be more effective if the agency:

- **Bases its regulatory integration effort on quantitative P2 baselines and metrics.** As the "stakes" get higher in P2 regulatory integration efforts, the imperative of quantitative P2-based metrics becomes greater. In other words, as the agency connects P2 regulatory integration to other ongoing "reinvention" activities (e.g. regulatory flexibility), there is a greater need to demonstrate in a measurable way the P2 results of regulatory integration.

- **Includes an evaluation component in its regulatory integration IPs.** Similarly, regardless of whether funding for P2 regulatory integration efforts is new or reallocated, there is a need to demonstrate the concrete results of the funding. Assuming P2 regulatory integration efforts are successful in bringing about P2, documentation of the results helps secure future funding opportunities and a wider acceptance within core regulatory programs.
- **Develops a long-range P2 regulatory integration vision.** By connecting funding to a larger vision of P2 regulatory integration, the reallocation of funds will have a more systematic basis and less of an appearance of random one-time action.
- **Establishes a clear, source reduction-based definition of P2.** Reallocating funds specifically to P2 may be a “wake up call” to programs regardless of whether the P2 to be funded is in the same program or not. Core regulatory programs, in particular, may question the need for P2 because “we’re doing it already.” The agency can use this as an opportunity to educate core regulatory programs about the difference between multi-media; source reduction-based P2 and single-medium, end-of-pipe pollution control. A clear, source reduction-based P2 definition can be the basis for such education.
- **Involves core regulatory program staff in planning regulatory integration efforts for which funds will be reallocated.** No program in the agency will be enthusiastic about having its funding reallocated, even if the regulatory integration initiative is within the core program. It may be possible to take advantage of core regulatory programs’ sense of ownership of funds by having those programs participate in determining the nature of P2 regulatory integration in their programs. Involving core program staff in developing P2 integration efforts for which funding will be reallocated provides the added benefit of tapping their technical and regulatory expertise while deepening their investment in the process.
- **Involves external stakeholders in planning regulatory integration efforts for which funds will be reallocated.** The industrial community may be interested in ensuring that services provided to them via the core regulatory programs are still available following reallocation of funds. For example, it is likely that business wants to participate in discussions that may lead to changes in reporting requirements. The environmental community will want to be assured that compliance via the core regulatory program will be achieved after funds are redirected from conventional core program activities. Involving such stakeholders in the planning of P2 regulatory integration efforts and the reallocation of funds will contribute substantively to the quality of those efforts as well as increase the potential for greater buy-in.

Perhaps more than any other issue associated with P2 regulatory integration, the issue of funding demands upper management leadership. Regardless of whether funding is new or reallocated, it cannot be effectively developed without vision and direction from the highest levels of the agency.

Developing a specific agenda for P2 regulatory integration IPs for which funding is required will prove to be more tangible than undefined, conceptual statements about the benefits of integration. Having a specific set of IPs and a standard operating procedure for implanting them into the day-to-day operations of core regulatory programs will enhance the prospects of new and continuing funding. The latter is particularly important because integration is not a one-time event. Instead, it is a process requiring ongoing commitment, reinforcement, adjustment, and evaluation.

❖ Institutional Change

The Importance of Incorporating Institutional Change into Regulatory Integration Efforts

The purpose of P2 regulatory integration is to seamlessly weave P2 into the fabric of core programs. Most integration efforts to date have failed on this score. The practical result is transient activities that are highly dependent on passing circumstances (e.g., the presence of a P2 advocate). When those circumstances change, integration activities often fall by the wayside. What is needed is a strategy to make integration independent of the changing circumstances of a state agency by linking it to the drivers of day-to-day operation of core regulatory programs. Only then can P2 become an integral part of core regulatory programs rather than a temporary and vulnerable “add on.”

Various factors drive the day-to-day operations of core regulatory programs. Some govern the regulatory process (e.g., statutes, regulations, the process of rulemaking). Others determine funding for core regulatory programs (e.g., source of funding, federal grant agreements). Still others are related to the management of core regulatory programs (e.g., mission statements, workplans, employee job descriptions, technical guidance documents, databases). All of these directly and indirectly dictate the functioning of core regulatory programs.

Unfortunately, most state integration efforts fall short of transforming these drivers. The result is seen time and again within many state agencies: P2 regulatory integration efforts become earmarked as stand-alone “P2 initiatives,” outside what is perceived by core program staff as their primary mandate and responsibilities. The consequences are that:

- Core regulatory program staff are not compelled to commit their expertise to integration efforts when other, more immediate priorities are pressing. P2 staff often are assigned regulatory integration responsibilities but often lack regulatory program expertise.
- P2 regulatory integration necessitates constant advocacy on the part of P2 staff for guidance, buy-in, and funding. This constant advocacy consumes resources that could otherwise be directed to implementation of regulatory integration efforts.
- P2 regulatory integration efforts are not lasting. Without addressing the underlying drivers of regulatory programs’ day-to-day operations, P2 regulatory integration is subject to the whims of changing administrations, staff turnover, and resetting of management priorities.
- When measurement of P2 regulatory integration efforts takes place, it tends to rely on independent metrics rather than on quantitative metrics of core regulatory programs.

An example that is common to many state agencies is general agency staff P2 training. Many state agency P2 training are well-intentioned and well-organized but lack a direct connection to key behavioral drivers which, in turn, undermine implementation. The result is that program staff attend training programs and subsequently return to their program work, to continue their activities business-as-usual, seeing no change in funding, workplans, rewards/incentives, or

priorities. In such situations, the core regulatory program staff typically consider such training interesting but inconsequential to their basic function in the agency.

Developing Regulatory Integration Approaches that Result in Institutional Change

The first step in changing the factors that dictate the day-to-day operations of core regulatory programs is to determine which factors drive a particular program. While some are common to most state agencies, each agency has its unique ones. Below is a list of drivers shared by most agencies:

- Regulatory Drivers:
 - Statutes
 - Regulatory limits (numeric, narrative, etc.)
 - The process of proposing and adopting rules
 - General powers of the agency
 - Professional judgement and review
 - Regulatory time deadlines
 - Regulatory geographic emphasis
 - Regulatory footprint (covered chemicals and pollutants, covered processes, facilities, etc.)

- Financial Drivers:
 - Sources of funding
 - Design of funding mechanism
 - Federal grant agreements
 - FTEs

- Management Drivers:
 - Policies and Procedures
 - Mission and Goal Statements
 - Workplans
 - Job Descriptions
 - Employee Performance Ratings
 - Agency Organizational Structure
 - Standard operating procedures

In select IPs, an agency should consider which drivers are key to the implementation of each practice to achieve systematic and lasting results.

To illustrate, an agency may choose to implement an IP in which “soft landings” are provided for industrial facilities that try to meet compliance through P2 approaches. As part of this IP, if the facility attempts and fails to achieve compliance via P2, the agency does not react in conventional enforcement mode. Rather, the agency may choose to establish a period of time in which a facility achieves compliance through alternative means. Implementing this IP without changing a key driver to enable a “soft-landing” is unlikely to achieve success. An example of this is selection of a few facilities for which settlement agreements include soft-landing provisions. In contrast, targeting key drivers—the preferred approach—may occur as follows:

- Establish parameters in regulations for when “soft landings” are to be provided
- Include language about “soft landings” in the core program’s workplan
- Include language about managing “soft landings” in employee job descriptions
- Consider “soft landings” management in annual review of employees’ job performance
- Modify the core program’s grant agreement with EPA to lessen other requirements in exchange for a greater number of “soft landings”
- Measure the result of the “soft landings” practice by tracking reductions normalized for production by each facility as well as tracking the number and type of “soft landings” undertaken by the program

The first approach relies heavily on the individual and changing circumstances of the affected programs. The advantage of the latter approach, in which key drivers are addressed, is that the IP becomes more ingrained and systemic. The IP becomes *integral* to the program and likely to remain in place long after the P2 advocate who developed it leaves the agency.

Perhaps the best approach for the agency to employ in transforming the factors that drive the day-to-day operations is to consider the exercise of changing these factors as part of the standard operating practice for development of any P2 IP. This way, reflecting P2 regulatory integration in factors that drive day-to-day operations of core regulatory programs becomes a routine practice. Developing a list of program drivers to consider in implementing P2 IPs is the first step. This step can be catalyzed by various events, including:

- Agency development of a long-term P2 regulatory integration plan
- Agenda development through means such as a Performance Partnership Agreement with USEPA
- Review and evaluation of steps taken in previous regulatory integration efforts at the agency

Another ingredient likely to spur or reinforce an agency’s transformation of key drivers is input from external stakeholders. P2 regulatory integration that changes core program drivers is likely to attract the attention of state-based non-governmental organizations, including industrial trade associations and environmental groups. This is so because actions affecting drivers raise the stakes for P2 integration, moving well beyond the marginal position P2 occupies in agency organizational structure. In its best form, involving these stakeholders early in the process helps build support within the agency for changing core program drivers. It also may help build the stakeholders’ capacity to promote P2 within their own constituencies, which itself may further reinforce agency initiatives.

Applying Institutional Change Considerations in Regulatory Integration

The benefits of transforming drivers of core regulatory programs may not be immediately recognizable. It invariably involves additional up-front work and staff resources. Furthermore, it is inherently different from more “shallow” regulatory integration efforts such as the familiar stand-alone training. “Deep” integration, as defined here, is more challenging to both core regulatory program staff as well as P2 staff because it necessitates thinking about the long-term results the agency wants from an IP. It also involves considerable “roll up your sleeves” work that requires concentrated individual and group effort in addition to planning work.

By design, transforming core program drivers may have the appearance of prompting hard and fast changes to how core regulatory programs have operated for years. In doing so, it attracts greater attention from core program staff and external stakeholders than do more marginal P2 regulatory integration efforts. Finally, transforming drivers has a direct impact on the responsibilities of both core program staff and P2 staff. Some staff may welcome these changes while others may be intimidated by the new responsibilities. This is both inevitable and healthy. At minimum, a change in one's day-to-day responsibilities is likely at least to prompt a good, hard look at the upcoming changes. Mid and upper management support, proper incentives, sufficient resources, and a long-term game plan can help staff embrace this transformation.

❖Multimedia Considerations

The Importance of Considering Multimedia Impacts as Part of P2 Regulatory Integration

Regardless of the chosen definition, P2 is incompatible with transferring pollutants across environmental media or increasing overall risk. While most states acknowledge the multimedia dimension of P2, multimedia considerations generally are not integrated into agencies' practice of P2. Conversely, occasionally agency P2 efforts become more focused on multimedia issues and, in doing so, lose their P2 emphasis. Keeping a clear vision of both P2 and multimedia considerations becomes even more difficult when trying to integrate P2 into core regulatory programs. The entrenched single-medium emphasis of core programs has the potential to thwart the multimedia promise of P2 by using P2 regulatory integration IPs to a single-medium focus.

For states that have a definition of P2 that accounts for multimedia aspects, considering multimedia impacts of P2 regulatory integration efforts should be automatic. For these states, as well as for those that lack a multimedia or any definition of P2, there remain compelling reasons to consider the multimedia impact of P2 IP.

- Additional environmental benefits of the IP may be identified. Eliminating or reducing the use, generation, or release of toxics at their industrial source often has positive results for more than one environmental medium. Eliminating toxics at their source means that they cannot be transferred among environmental media. For example, switching to water based solvents may reduce volatile organic compounds in fugitive air emissions as well as in wastewater discharges (but may create TDS with caustic cleaners or BOD with citrus-based cleaners).
- Identification of unacceptable transfers of risks or pollutants to other media may misrepresent certain techniques as P2. If an agency determines that its definition of P2 does not allow for transfers of pollutants or toxics to other media, considering potential multimedia impacts is essential to evaluating whether a given practice does, indeed, constitute P2.
- The financial benefits of P2 over end-of-pipe treatment may be more evident. Most state P2 regulatory integration efforts are voluntary in nature. They anticipate that the financial gains of P2 will be sufficient motivation for industry to adopt P2 practices. Assessing multimedia impacts of P2 practices will determine whether the P2 practice resulted in financial impacts in other media.
- Opportunities to expand the IP to other regulatory program areas may be developed. Identifying possible multimedia impacts of a P2 technique or IP may be a valuable opportunity for single-medium regulatory programs to work cooperatively to address the problem. Cooperative problem-solving efforts among various regulatory programs may help identify important ways in which the IP can be enhanced for greater overall effectiveness.
- Additional P2 opportunities may be identified. Broadening the scope of impacts that are considered allows the agency and the industrial facility to have a better view of the interrelationships between various operations at the facility. Doing so may help both the agency and the facility identify additional P2 opportunities.

While a state may limit its multimedia vision to the three environmental media (air, water, land), other states may choose to broaden their view of the impact of their P2 regulatory integration effort to include: impacts on consumers via toxic materials in products; workers' health and safety; transportation hazards, and the like. The decision to have a broader view may be driven by the agency's definition of P2. In any case, considering as broad a list of impacts as possible will allow an agency's P2 regulatory integration efforts to drive even more comprehensive, "upstream" improvements in industry.

Developing a P2 Regulatory Approach that Considers Multimedia Impacts

More often than not, P2 regulatory integration efforts involve inserting P2 considerations into single-medium regulatory programs. An agency may consider several strategies:

- **Reflecting multimedia impacts in the agency's P2 definition.** Even if a state definition is focused on a single medium (e.g. hazardous waste), the agency may still have the opportunity to emphasize that P2 in that medium should not shift pollutants to other media.
- **Ensuring that the P2 baseline and metrics developed for an IP have a multimedia focus.** Like other challenges facing P2 regulatory integration, multimedia impacts are more likely to be considered when they are quantifiable. Coupling P2 metrics with conventional end-of-pipe measurement tools used by single-medium regulatory programs may result in a valuable approach for tracking multimedia P2.
- **Ensuring that any evaluation component developed for a P2 regulatory integration IP assesses multimedia impacts.** State agency innovations require both mid-course and final evaluations to determine whether the desired result was achieved. Adding consideration of multimedia impacts, particularly to any mid-course evaluations, will allow for changes to the IP in order to redirect attention to multimedia impacts.
- **Stressing multimedia considerations in any regulatory integration long-range plan or standard operating procedures developed by the agency.** Making multimedia considerations a consistent theme in all agency planning efforts regarding regulatory integration will help to maximize its role in the implementation of IPs.
- **Including multimedia considerations in changes to drivers of core regulatory programs.** Development of lasting P2 regulatory integration efforts requires changing the factors that drive the day-to-day operations of the agency. The importance of multimedia considerations in P2 regulatory integration needs to be reflected in changes to these factors as well so that considering multimedia impacts becomes a systemic and lasting component of P2 regulatory integration.

Applying Multimedia Considerations in P2 Regulatory Integration Efforts

There are clear challenges to implementing P2 regulatory integration efforts in a way that considers multimedia impacts. As with P2 regulatory integration in general, core regulatory program staff may feel burdened with additional responsibilities associated with considering multimedia impacts. Core regulatory programs may question the mandate that allows for single-medium programs to consider multimedia impacts. Also, like overall P2 regulatory integration, the consideration of multimedia impacts may seem secondary to core regulatory program staff compared to their own pressing priorities. Finally, core regulatory program staff may struggle to understand how to consider multimedia impacts due to a lack of understanding of the other single-medium programs.

One way to advance the consideration of multimedia impacts in P2 regulatory integration efforts is to require that *all* P2 IPs have a multimedia component. Setting a standard in the agency in which multimedia impacts are at least considered in P2 regulatory integration efforts will help to develop an agency culture in which even P2 in single-medium regulatory programs will turn an eye towards multimedia impacts.

❖Evaluation

The Importance of Evaluating P2 Regulatory Integration Efforts

There are compelling reasons to evaluate the environmental impact of any new regulatory innovation developed by a state agency. Evaluation allows for mid-course corrections, improved decision-making, and documentation of progress. However, for various reasons—lack of a mandate, inadequate planning, insufficient resources, competition from other priorities—state environmental regulatory agencies often fail to develop a thorough evaluation of components to their regulatory innovation initiatives.

The same failure often occurs in state P2 regulatory integration efforts. This compendium outlines 50 IPs, some of which have been attempted by state agencies. While there are sometimes anecdotal accounts of these efforts, surprisingly little publicly available information much less comprehensive, and quantifiable evaluation. In addition, some recent state efforts predicate the redesign of a regulatory structure on the expectation of P2 results without having quantifiable evaluation components. In situations in which regulatory flexibility is offered as an incentive for P2, the importance of a sound evaluation component is heightened in order to ensure that the flexibility, in fact, *results* in P2. The other benefits of evaluating P2 regulatory integration IPs are that it may:

- Motivate core regulatory program staff to acknowledge the benefits of regulatory integration and seek additional opportunities for it in their programs
- Allow funders to recognize the tangible results of the IPs
- Build support within external stakeholder communities for integration efforts

The objective of any evaluation, of course, is to determine whether the IP led to P2 that would not have otherwise occurred or would not have otherwise occurred as effectively or efficiently without the IP. In addition, a comprehensive, quantifiable evaluation component can:

- Assess the process of developing the IP as well as the P2 result. In particular, evaluation can determine whether the underlying drivers of the affected core regulatory programs were changed to ensure that the IP would continue on a systemic and lasting basis. It can also identify techniques for developing the IP within the agency that were effective and may lend themselves to development of other IPs in the future.
- Rely on the P2 baselines and metrics developed for tracking P2 progress at an industrial facility. As discussed in the P2 Baselines and Metrics Section, baselines and metrics serve the dual purpose of tracking P2 progress at an industrial facility and providing a quantifiable foundation for assessing the P2 impact of the IP.
- Consider all environmental benefits that may have resulted from the IP, such as multimedia considerations. Because of its multimedia nature, P2 may result in environmental benefits that, while not necessarily prevention-based, may be multimedia.
- Determine whether specific regulatory or statutory obstacles to the implementation of the IP exist. While there has been considerable discussion as to whether statutory and regulatory obstacles to P2 exist, there has been limited documentation of specific

obstacles. Implementation of P2 regulatory integration IPs creates the ideal opportunity to determine whether any specific regulatory or statutory obstacles are present. Evaluation allows for documentation of such discoveries.

In short, the reasons for building a formal evaluation component into the up-front design of a P2 regulatory integration IP are compelling. It is incumbent on the agency to consider evaluation an integral aspect of P2 regulatory integration.

Developing an Evaluation Component

Evaluation often becomes a secondary consideration in state environmental regulatory agencies. Perhaps the best way to ensure that resources are available and utilized for evaluation is to include the evaluation component as an integral part of the overall design of the IP. If viewed as part of the IP, there is less chance evaluation will be left by the wayside as implementation of the IP proceeds. Some ways in which the evaluation component can be included as an integral element of the IP are:

- Ensuring that the P2 baseline and metrics lend themselves not just to tracking P2 progress at individual industrial facilities, but to more aggregate measurements (e.g., geographic or sector-based, environmental trends) as well
- Budgeting for the evaluation component as part of the overall resources assigned for implementation of an IP
- Describing the evaluation component in all written proposals, memoranda, and other communications regarding the IP. Including specific elements of the IP that warrant particular attention via the evaluation
- Establishing a clear expectation for when it is appropriate to initiate the evaluation
- Conducting, at minimum, a mid-course mini-evaluation to highlight the indispensable role that evaluation plays in implementation of the IP
- Notifying both internal and external parties involved in developing the IP that mid-course and final evaluations will be conducted

In developing the evaluation component of the IP, the agency must keep in mind that its key goal in implementing the IP is to bring about P2. While there may be secondary results that the agency will want to consider in an evaluation (e.g., the process by which the IP was developed), the fundamental issue is whether P2 was achieved. Measuring whether P2 was achieved means relying on the P2 baselines and metrics specifically designed to quantify P2 at an industrial facility. When aggregated (e.g., for all facilities affected by a particular IP), the P2 metrics can serve as the foundation for a substantive evaluation.

Factors other than P2 metrics, some more qualitative, may be considered as part of an evaluation. For example, the agency may want to study the process by which the IP was developed and implemented, other environmental benefits, other unexpected impacts at both the industrial facilities and the agency (e.g., cost savings, improved internal communication, etc.). In these cases, the agency will need to consider use of evaluation techniques in addition to quantitative P2 metrics. Questionnaires and interviews may need to be conducted. Non-P2 environmental data

may need to be analyzed. Again, determining the most appropriate evaluation tools will be driven by the specific issues the agency wants to consider in the evaluation.

Applying the Evaluation Component

In addition to limited resources, another reason that state agency innovations are often not substantively evaluated is the fear of finding that the innovation did not, in fact, produce the desired result. A negative result, however honest, necessitates additional effort and change on the part of an agency that may have already undergone significant upheaval to implement the innovation in the first place. Staff may fear that a negative result reflects poorly on their efforts to implement the innovation or serve as a handy excuse for arguments against implementing future innovations.

Addressing these concerns is critical to creating an atmosphere in which an honest evaluation can be conducted. It is essential that management create a climate that recognizes that failures and mid-course corrections are an integral part of developing creative innovations in the agency. Without such a climate, staff, particularly core program staff, are less likely to be motivated and empowered to initiate IPs.

State agencies also need to guard against making black-and-white determinations based on the results of their evaluations. A tendency to conclude that the IP “worked” or “didn’t work” will result in continuation of the practice identical to its original conception or its evolution at the point of termination. Rather, the evaluation needs to assess both the result of the overall IP as well as the effectiveness of particular elements of the practice. The latter will allow the agency to “tinker” with an IP to increase its overall effectiveness as well as identify individual elements that proved effective and may lend themselves to other IPs. This avoids the irony of past innovation stifling future innovation.

Involving both internal (e.g., core regulatory program staff, management) and external (industrial facilities, non-governmental organizations, other government agencies) in the evaluation will not only add to the credibility of its results, but will also make it a better evaluation. These individuals can be involved in several ways, including:

- Designing methods of analyzing P2 metrics
- Providing insights into the reasons for the success or failure of an IP
- Identifying particular elements of the IP that deserve attention in the evaluation
- Recommending changes to particular elements of the IP to increase its overall effectiveness

The results of both mid-course and final evaluations should be documented, formally or informally. Documentation is essential to allow the results of the evaluation to be applied both in the current IP as well as in the development of future IPs. Documentation of the evaluation can serve as the basis for any mid-course corrections of the IP. It can also serve as the basis for any future decision-making the agency may consider related to the IP (e.g., expansion of its use, etc.). Documentation can also identify particular elements of the IP that the agency found effective and intends to apply in future efforts.

Evaluation is a critical part of the development and implementation of P2 regulatory integration IPs. It serves as the foundation for improving and expanding P2 regulatory integration by substantively determining the most effective elements of the agency's innovations. By specifically tracking an IP's P2 results, the evaluation component of an IP can help the agency assess its efforts and help focus integration efforts on the approaches that prove to be most effective in achieving P2.

❖ Environmental Cost Accounting

What is Environmental Cost Accounting?

Environmental Cost Accounting, or ECA, is a set of tools for estimating the true costs and benefits of an environmental project or program. Using ECA to recognize these environmental costs and benefits will help lead to regulatory integration practices that deliver the greatest amount of P2 for a given level of investment.

Costs (and benefits) that companies may consider in deciding whether to make an investment in P2 fall into four categories (Table 2). A company generally takes into account the first two: capital costs and operating and maintenance costs. However, companies often neglect to consider the second two types because they are “hidden” or less tangible. Some are borne directly by the company; and others by parties outside the company. Examples of costs borne directly by the company include: a decrease in regulatory fees for releasing less pollution; the decrease in labor required to respond to non-compliance notices; and lower energy costs if new equipment is more energy-efficient. These exemplify potentially hidden costs that appear somewhere on a company’s balance sheet, though the company may not explicitly recognize that they are linked to pollution prevention activities.

Examples of costs borne by parties outside the company and that are almost always excluded from traditional cost analyses include the impacts on human health and the environment avoided by the transition to a cleaner production process. This last category is often called “external costs” or “externalities” because the costs are borne not by the company but by people outside the company, such as the neighbors who breathe polluted air. Yet, from society’s standpoint, all of these costs and benefits should be considered if a firm is to make the most efficient and beneficial decision about environmental investments.

Table 2. Examples of Costs to Consider in Applying ECA Tools

Standard Costs		Additional Costs to Consider in ECA	
Capital/Start-up Costs	Operating Costs	Contingent and Other “Hidden” Costs	External Costs
<ul style="list-style-type: none"> ■ Buildings and land ■ Purchased equipment ■ Materials ■ Utility systems & connections ■ Site preparation ■ Construction/installation ■ Planning/engineering ■ Start-up/training ■ Permitting ■ Working capital 	<ul style="list-style-type: none"> ■ Direct materials ■ Direct labor ■ Employee benefits ■ Employee safety and health compensation ■ Utilities (energy) ■ Regulatory compliance ■ Record-keeping ■ Contracting ■ Legal services ■ Services provided by other agencies ■ Maintenance ■ Depreciation ■ Debt service ■ Monitoring/testing 	<ul style="list-style-type: none"> ■ Liability (e.g., Superfund, personal injury, property damage) ■ Future regulatory compliance costs, penalties and fees ■ Emergency preparedness ■ Sick days directly related to use of toxics ■ Remediation costs ■ Closure/decommissioning costs ■ Corporate image impacts ■ Cycle time ■ “Green Market” share 	<ul style="list-style-type: none"> ■ Environmental damage ■ Human health impacts ■ Buildings/infrastructure impacts ■ Regulatory oversight

The firm already has an incentive to consider the most standard costs, those in the first two columns. While there may be some incentive to consider the costs in the third column as well, many such costs are difficult to quantify. For example, how much of the costs of reduced sick days can be attributed to the discontinuation of a certain toxic chemical? Or, how many penalties were avoided because a company invested in a P2 practice? Other costs may be hidden because they are buried in overhead accounts and not properly allocated to the activity that generates them, such as an emissions fee that results from an old or inefficient treatment device.

The costs in the fourth column are still more difficult to quantify. Government has a key role to play by creating incentives for firms to consider those less obvious costs. This intervention can occur during rulemaking, budgeting, enforcement or other phase of the project. Sometimes, that incentive can be as simple as technical assistance that calls a firm’s attention to costs it might not have considered. In other instances, the government may create “carrots” and “sticks” to induce changes in decision-making so that external costs do not remain hidden, but rather, are factored into decisions with the same weight as internal costs.

A few principles should be kept in mind when tallying these costs:

- All costs should be given on a consistent time scale, such as annually.

- Costs should be allocated to the extent possible to the specific activity that generates them (for example, do not lump energy usage into a general overhead account, but instead allocate it directly to the processes that use the energy).
- Consider carefully the appropriate timeframe. Some significant costs, such as remediation costs, are only relevant in the long run, so to select a timeframe that is too short can be misleading.
- Revisit the ECA at regular intervals. Circumstances may change that alter the cost-effectiveness of a practice over time.
- All results should be measurable and comparable. Costs should be tracked and normalized to production so that they can be compared across products or processes.
- Some companies may benefit from the use of software developed to help identify environmental costs, such as the P2/FINANCE® models developed by Tellus for EPA.

A note on terminology. There are many closely-related terms to ECA such as Environmental Accounting, Full Cost Accounting, Total Cost Assessment, Life-Cycle Assessment, and Activity-Based Costing. These terms have various nuances of meaning and various instances in which they are invoked. While they share an emphasis on identifying hidden costs and properly allocating costs to the activities that incur them, they vary and sometimes overlap in scope and application. See the EPA's *An Introduction to Environmental Accounting as a Business Management Tool: Key Concepts and Terms* (EPA 742-R-95-001) for a further explanation of these terms.

The Importance of ECA in P2 Regulatory Integration

A good decision is based on full information. Because P2 projects tend to involve costs and savings typically neglected by conventional accounting practices, ECA is the only means of taking into account all the relevant information underlying P2 decisions. The links between ECA and P2 are powerful and measurable. There are many instances in which investments in P2 did not look cost-effective until an ECA was performed. One study showed that the average annual savings per P2 project in production facilities, where data were available, were just over \$351,000, which was equivalent to \$3.49 saved for every dollar spent. In addition, an average of 1.6 million pounds of waste was reduced at each facility (INFORM 1985 and 1992).

Failure to develop adequate cost data can have serious consequences. For example, potentially cost-effective P2 options may be rejected because externalities and second- and third-order effects are ignored, time horizons of the analysis are too short, or inappropriate profitability indicators are chosen. For example, switching from a solvent coating to a water-based coating may require a seemingly large investment in equipment. After tallying the savings, costs of not having to report additional chemical releases to EPA, of avoiding an emergency evacuation plan, of not running the risk of a Superfund penalty, of reducing the risk of injured employees and a degraded environment, the prevention investment is far more desirable.

Clearly, ECA is a key component of P2 decision-making. As such, it needs to be considered at every step of regulatory integration. If the goal of integrating P2 into core regulatory programs is to transform core regulatory programs into engines for P2, then ECA is an essential component.

When linked to P2 regulatory integration efforts, ECA can bolster the prospects of an IP bringing P2 into core regulatory programs.

Developing Regulatory Integration Approaches that Incorporate ECA

While the concept of an ECA may be unfamiliar to many state environmental regulators, it is a key one to grasp by those agency staff responsible for P2 regulatory integration. Fundamentally, it means using core regulatory programs as mechanisms to require or encourage companies to measure true costs as a means of realizing the financial benefits of P2. Linking ECA to P2 regulatory integration efforts can be developed in ways that are either a mandatory or voluntary component of a P2 regulatory integration effort. Many of the IPs would be strengthened if an environmental costing component were included. Certain practices are especially strong candidates for ECA. Among these are:

- **Facility Planning** – ECA can be used to evaluate plans for product design, process design, capital investments, or waste management options. For example, the New Jersey Pollution Prevention law requires a “comprehensive financial analysis” of the costs associated with the use, discharge, generation or release of hazardous substances, including the costs of savings for investments in P2, more efficient use of raw materials, the cost of treatment, the cost of hazardous waste disposal, and reduced liability.
- **Incentive-based Programs** – Programs in which agencies provide regulatory flexibility for a greater level of environmental protection are a growing trend in state agencies. Requiring the performance of ECA could be a criterion for companies to receive regulatory flexibility or other incentives. For example, Louisiana DEQ, Ciba-Geigy's St. Gabriel facility, and USEPA developed a cooperative agreement as part of USEPA's initial pilot phase of the Environmental Leadership Program (ELP). This effort included evaluating the process by which the company identifies and implements P2 opportunities, evaluating the community outreach/employee involvement portion of Ciba's EMS P2 program, and evaluating the environmental cost accounting component of that program.
- **Negotiated Settlements** – Agency efforts in which P2 components are included in compliance agreements and Supplemental Environmental Projects (SEPs) can include ECA components.
- **Tradable Permits** – Tradable permits have their origin in cost efficiency. They are based on the principle of letting the firm that can reduce pollution most cost-effectively reduce its pollution first, though another firm may pay for that reduction.
- **Permit and Compliance Assistance Programs** – Many state agencies are now providing companies with P2 information as part of permit application reviews and compliance inspections. These efforts can be broadened to also include dissemination of information about ECA. For example, Florida has developed and implemented a Full Cost Accounting Workbook to help solid waste managers make prudent decisions about waste disposal. In Canada, a major electric utility has explored how ECA can enhance management decisions. (*Environmental Accounting Case Studies: Full Cost Accounting for Decision Making at Ontario Hydro* (EPA 742-R-95-004, 1996))

- **Standard Setting/Rule Development** – Agencies can take steps such as requiring companies to conduct an ECA of P2 options to reveal the true costs/benefits of process changes prior to approval of those changes.
- **Financial Assistance** – In programs where financial assistance is provided for environmental investments, the agency could consider requiring applicants to conduct an ECA in order better to evaluate its short and long-term financial needs.
- **Compliance Analysis** – Agencies could include requirements or incentives in permits for companies that conduct an ECA of various options for achieving compliance with an agency imposed standard. This could also be applied in cases when a company is claiming financial hardship in meeting an agency requirement. The agency may require the company to broaden its conventional financial justification via ECA approaches.

Applying ECA in Regulatory Integration Efforts

Environmental financial analyses fail to provide managers with a clear picture of P2 benefits. ECA enables early incorporation of all costs into decisions about products and processes in order to achieve the most beneficial outcome for the company and for society. Cost-effective P2 creates win-win situations. ECA is one of the areas where government and industry can find common ground and will help identify mutually beneficial outcomes.

Despite the win-win nature of many ECA-based practices, there are certain obstacles the agency may have to overcome in integrating ECA into its regulatory structure. For example:

- **Lack of training on part of staff** – Staff who are not familiar with economics may feel intimidated by the prospect of conducting a cost-benefit analysis or in coaching a company how to do one. However, there are many guides available that break down the process into simple steps and will facilitate the process of educating staff and communicating with companies.
- **Perceived lack of authority for the agency to include ECA in P2 regulatory integration** – Because the use of ECA is not widely known, regulators may assume that it is not within their power to require it. However, ECA should be considered simply another tool in a regulator’s toolbox along with the power to withhold permits, the ability to require disclosure of certain information, and the imposition of penalties and fines.
- **Lack of support by external stakeholders** – As with many new ideas, ECA may be regarded initially with some skepticism. Yet industries will quickly see how ECA can benefit the bottom line, and they will appreciate the agency’s responsiveness to economic concerns. Environmental organizations will want to ensure that in the event of any regulatory flexibility that accompanies an ECA that progress continues in protecting the environment. These concerns are compatible with incorporating ECA into new regulations.
- **Burdensome for program staff with numerous responsibilities** – In any attempt to reinvent a regulatory framework with a P2 orientation, there will need to be a shift in staff responsibilities. Experienced agency managers expect that such a transition must occur gradually and with appropriate resources for staff re-training.

As with other challenges facing P2 regulatory integration, challenges particular to ECA need to be addressed in order to produce comprehensive and systemic P2 regulatory integration. A long-term vision for P2 regulatory integration, an appreciation for the importance of ECA, and top management support can help contribute to the development of core regulatory programs with a P2 focus and a strong ECA component.

IV. INNOVATIVE PRACTICES

The following 50 P2 regulatory integration IPs are individually described according to the standard format described on page 47:

I.D. NUMBER	IP	Targeted Area of Agency
1	Staff Training <ul style="list-style-type: none"> ▪ General P2 Training of New Staff ▪ Staff Training for the Purpose of Implementing P2-based Changes in Core Regulatory Programs 	<ul style="list-style-type: none"> ▪ Agency Culture/Operations
2	Include P2 in Agency Staff Performance <ul style="list-style-type: none"> ▪ Employee Performance Measures Based on P2 ▪ Employee Rewards Based on P2 ▪ Modify Job Descriptions to Include P2 	<ul style="list-style-type: none"> ▪ Agency Culture/Operations
3	Including P2 measures/activities in workplan agreements with USEPA, including both renegotiated medium-specific workplans and NEPPS agreements	<ul style="list-style-type: none"> ▪ Agency Culture/Operations
4	Instituting Efforts to Measure/monitor resources dedicated to P2	<ul style="list-style-type: none"> ▪ Agency Culture/Operations
5	Publicly reporting on agency P2 activities, achievements, and statewide trends	<ul style="list-style-type: none"> ▪ Agency Culture/Operations
6	Providing incentives to industry via partnership programs to foster specific P2 goals, efforts, metrics, etc.	<ul style="list-style-type: none"> ▪ Agency Culture/Operations
7	Agency Reorganization	<ul style="list-style-type: none"> ▪ Agency Culture/Operations
8	Instituting practice of P2 review during adoption of new/revised regulations	<ul style="list-style-type: none"> ▪ Agency Culture/Operations
9	Adoption of multi-year P2 strategic plan	<ul style="list-style-type: none"> ▪ Agency Culture/Operations
10	Establishment of practices for integrating P2 into programs to lure new business into the state	<ul style="list-style-type: none"> ▪ Agency Culture/Operations
11	Establishing fees that are designed to promote P2	<ul style="list-style-type: none"> ▪ Financial
12	Imposing penalties that are designed to promote P2 response in achieving compliance	<ul style="list-style-type: none"> ▪ Financial ▪ Compliance
13	Reallocation of existing agency resources to fund P2 efforts, including: <ul style="list-style-type: none"> ▪ NEPPS ▪ P2 set-aside programs 	<ul style="list-style-type: none"> ▪ Financial ▪ Agency Culture/Operations
14	Provide new funds for P2 efforts through state general funds	<ul style="list-style-type: none"> ▪ Financial
15	Basing Decisions Regarding Size of New Treatment Systems on Anticipated Impact of P2	<ul style="list-style-type: none"> ▪ Standard Setting/Rule Development
16	Designing bankable/tradable emissions credit programs to be drivers for P2 (including giving credit to facilities who retire credits gained through P2 measures)	<ul style="list-style-type: none"> ▪ Standard Setting/rule Development

17	Incorporating P2 techniques into anti-degradation standards	<ul style="list-style-type: none"> ▪ Standard Setting/Rule Development
18	Establishing connections in regulations between environmental standards and requirements for: (a) occupational health and safety and (b) transport of hazardous materials	<ul style="list-style-type: none"> ▪ Standard Setting/Rule Development
19	Basing regulatory standard on restriction or phase-out of a particular chemical or raw material	<ul style="list-style-type: none"> ▪ Standard Setting/Rule Development
20	Including conditions in a rule or permit that require the consideration of multimedia impacts of a single-medium regulatory standard or condition	<ul style="list-style-type: none"> ▪ Standard Setting/Rule Development ▪ Permitting
21	Including specific P2 components in agency Business Organizational Reviews	<ul style="list-style-type: none"> ▪ Standard Setting/Rule Development ▪ Agency Culture/Operations
22	Defining an enforceable regulatory standard (MACT, BACT, Best management Practices, State-of-the-Art, etc.) to be either P2-based or P2-preferential and or including such P2-based standard in permit	<ul style="list-style-type: none"> ▪ Standard Setting/Rule Development ▪ Permitting
23	Establishing standards that require facilities to institute specific P2 approaches, including, but not limited to: <ul style="list-style-type: none"> ▪ Specific levels of reduction ▪ Materials flow and/or chemical efficiency ▪ Specific chemical efficiency measures ▪ Implementing raw material substitution measures ▪ Product specification standards ▪ Standards for use of raw materials per unit of product, and/or generation of any emissions/discharges/wastes per unit of product ▪ Considerations of environmental cost accounting 	<ul style="list-style-type: none"> ▪ Standard Setting/Rule Development
24	Broadening the impact analysis of regulations to consider total costs of the regulation	<ul style="list-style-type: none"> ▪ Standard Setting/Rule Development
25	Requiring that a facility develop a pollution prevention plan, the implementation of which is voluntary	<ul style="list-style-type: none"> ▪ Facility Planning
26	Requiring that a facility implement a pollution prevention plan	<ul style="list-style-type: none"> ▪ Facility Planning
27	Linking P2 Plans to Permitting and Enforcement through: <ul style="list-style-type: none"> ▪ Reviewing P2 Plans as part of permit application process or compliance inspection ▪ Using enforcement or permitting mechanisms to require techniques contained in P2 plan 	<ul style="list-style-type: none"> ▪ Facility Planning ▪ Permitting ▪ Compliance
28	Relating P2 Planning with Accident Release Program Planning	<ul style="list-style-type: none"> ▪ Facility Planning
29	Relating P2 Plan to Programs involving Environmental Management Systems (EMS)	<ul style="list-style-type: none"> ▪ Facility Planning
30	Developing multimedia permits that include a pollution prevention basis	<ul style="list-style-type: none"> ▪ Permitting
31	Providing pollution prevention information to facilities through permit application process and compliance inspections, including: <ul style="list-style-type: none"> ▪ P2 staff person participating in permit reviews or inspections ▪ Permit writer or inspector reviewing P2 Plan 	<ul style="list-style-type: none"> ▪ Permitting ▪ Compliance

	<ul style="list-style-type: none"> ▪ Permit writer or inspector providing general or more technologically-specific P2 information ▪ Permit writer or inspector providing advice on how facility may be excluded from regulatory loop if P2 measures are implemented 	
32	<p>Including administrative incentives in a permit or rule in exchange for the facility undertaking a specific P2 effort and/or achieving quantifiable progress, including incentives such as:</p> <ul style="list-style-type: none"> ▪ Less inspections ▪ Longer permit life ▪ Less sampling ▪ Extended effective date of permit conditions for facility agreement to meet condition via P2 measures 	<ul style="list-style-type: none"> ▪ Permitting ▪ Standard Setting/Rule Development
33	Agency fast-tracking review of permit modifications for P2 changes	<ul style="list-style-type: none"> ▪ Permitting
34	Having permit and/or compliance staff make referrals (both mandatory and voluntary) to P2 Technical Assistance Program or P2 Compliance Assistance Program (both in-house and external), including referrals based on agency analysis of data publicly reported by a facility	<ul style="list-style-type: none"> ▪ Permitting ▪ Compliance ▪ Reporting
35	Setting agency priorities for permitting and enforcement schedules based on P2 factors	<ul style="list-style-type: none"> ▪ Permitting ▪ Compliance ▪ Agency Culture/Operations
36	<p>Including conditions in permit or compliance settlement (with no penalty reduction) for facility to undertake a defined P2 effort, including:</p> <ul style="list-style-type: none"> ▪ Implementation of a specific P2 technique ▪ Development of a P2 Plan ▪ Achieving P2 goals outlined in a Plan ▪ Use of a different raw material ▪ Achieving a specific level of chemical efficiency, use of raw materials per unit of product, or generation of emissions/discharges/wastes per unit of product ▪ Publicly reporting metrics to track P2 progress ▪ Conducting a materials accounting ▪ Meeting product specification standards ▪ Achieving a defined level of reduction 	<ul style="list-style-type: none"> ▪ Permitting ▪ Compliance
37	Providing Financial Incentives to Promote P2, such as Grant or Loan Programs and Tax Incentives	<ul style="list-style-type: none"> ▪ Financial
38	Establishing P2 provisions in general permits and permits-by-rule	<ul style="list-style-type: none"> ▪ Permitting
39	Establishing broader cap for emissions (e.g. PAL) to encourage operational flexibility that would prompt P2 changes	<ul style="list-style-type: none"> ▪ Permitting
40	Establishing operational flexibility by building in anticipated changes in production, operating scenarios and respective upcoming standards in initial permit	<ul style="list-style-type: none"> ▪ Permitting
41	Defining in the up-front permit, categories of changes (P2 and otherwise) that do not require agency approval	<ul style="list-style-type: none"> ▪ Permitting
42	Defining categories of changes (P2 and otherwise) in the original permit that require lesser agency administrative review	<ul style="list-style-type: none"> ▪ Permitting
43	Unifying various reporting requirements from a facility so that they are derived from the same source and use a P2 baseline measure	<ul style="list-style-type: none"> ▪ Reporting

44	Requiring facilities to publicly report quantifiable data to track P2 progress	<ul style="list-style-type: none"> ▪ Reporting
45	Overlaying various data reported by a facility (e.g. permit data, TRI data, air emissions statement, hazardous waste generator reports, etc.) to identify areas to focus P2-based permit and compliance activities	<ul style="list-style-type: none"> ▪ Reporting ▪ Permitting ▪ Compliance
46	Conducting multimedia inspections for the dual purpose of checking compliance and encouraging facilities to recognize P2 opportunities	<ul style="list-style-type: none"> ▪ Compliance
47	Negotiating P2 agreements into Supplemental Environmental Projects (SEPs)	<ul style="list-style-type: none"> ▪ Compliance
48	Providing penalty amnesty to facility that agrees to achieve compliance via P2 measures	<ul style="list-style-type: none"> ▪ Compliance
49	Providing penalty relief in cases where facility attempted to achieve compliance via a P2 measure that failed.	<ul style="list-style-type: none"> ▪ Compliance
50	Extending compliance schedule to allow a facility to achieve compliance via a P2 measure	<ul style="list-style-type: none"> ▪ Compliance

IP 1

Cul	Rul	\$	FP	Per	Enf	Rep
-----	-----	----	----	-----	-----	-----

Staff Training

Description

Developing materials and training sessions for agency staff to either gain a general introduction to pollution prevention (P2) concepts or to advance a particular P2 initiative.

Development of an approach for staff training is unique compared to other IPs in this compendium. Staff training can be the means by which the seven criteria can be promoted as the framework for any P2 regulatory integration initiative. In other words, while the seven criteria apply to staff training itself, they can also be the basis for efforts within a training curriculum to identify and develop P2 regulatory integration initiatives for the agency.

There are several types of training that are relevant to P2 regulatory integration as outlined in the chart below:

Type of Training	Primary Focus Area
General P2 Training	<ul style="list-style-type: none">• Definition of P2• General Awareness• Information Resources Available
P2 Assessment Training	<ul style="list-style-type: none">• Technical Industrial Process information• Source identification and quantification• Technical analysis• Financial analysis
Regulatory Integration Training	<ul style="list-style-type: none">• Regulatory reviews to identify P2 obstacles and opportunities• Mapping steps that regulatory programs (e.g. permitting) follow to determine where P2 opportunities are• Develop voluntary initiatives in regulatory programs
Strategic Training	<ul style="list-style-type: none">• Management involvement• Identify changes to policies and procedures• Evaluation and program improvement• Establishment of priorities for P2

- *P2 Definition* – A clear definition of P2 that is consistent with the agency’s definition should govern the content of any staff training. Training should ensure that any P2 regulatory integration initiatives pursued as a result of the training are consistent with the P2 definition.
- *P2 Baseline and Metric* – Training can present an invaluable opportunity for infusing the concept of measurable baselines and metrics designed to track P2. Integration of an effective P2 baseline and metric can be considered in the development of ideas for P2 regulatory integration at staff training sessions.

- *Agency Resources* – Staff training is an opportunity to ensure that sufficient resources for the implementation of a P2 regulatory integration initiative are incorporated up front in the development of an initiative.
- *Institutional Change* – One of the great frustrations of state agencies that did undertake early P2 training programs is that they did not lead to lasting institutional P2 changes at the agency. Increasing the likelihood that staff training will result in effective P2 regulatory integration involves designing the training to: effectively communicate the integration in the day-to-day activities of staff; have a specific focus, ensuring that funding is available to follow-up on the initiatives identified during training; demonstrate upper management commitment to follow through on initiatives identified; and incorporate criteria, such as the seven here, in the design of any P2 regulatory integration initiatives that may be developed as a result of the staff training.
- *Multimedia Considerations* – To sharpen the focus of training, an agency may find itself tailoring training to single-medium programs (e.g. P2 in water permits, P2 in hazardous waste inspections). While such coverage may be necessary, it should not preclude discussions on multimedia impacts. For example, a training on P2 in hazardous waste inspections can include a discussion on the inspector’s potential role in identifying cross-media impacts or P2 opportunities in other media.
- *Evaluation Component* – Each training requires evaluation to improve the effectiveness of the next one. Qualitative evaluation approaches that are designed to gauge the participants’ reactions to the training serve an important purpose. However, they should be complemented by quantitative evaluation of results over time (e.g., how many P2 regulatory integration initiatives were put in place according to the seven criteria as a result of the P2 training effort). Such evaluation will help assess whether the training achieved its ultimate goal of P2 regulatory integration.
- *Environmental Cost Accounting (ECA)* –Staff training can benefit from providing staff with a general understanding of the importance of ECA applied to industrial P2. Initially, this should be at a general, conceptual level, leaving more in-depth treatment to subsequent specialized training.

Implementation Challenges

- *Regulatory/Statutory* – None.
- *Financial* – State agencies may face constraints when trying to identify funding to develop and follow up on P2 staff training. Some states have used federal grant dollars to fund training needs.
- *Institutional* – This is the greatest area of challenge in developing and implementing an effective P2 staff training effort. What appears to be key to the effectiveness by which training leads to genuine P2 change in core programs is: identification of specific P2 regulatory integration initiatives as a result of the training; dedication of some portion of the staff training resources to be dedicated to follow-up; and up-front upper management commitment and direction for implementing any P2 regulatory integration initiatives that result from the staff training efforts.

- *External* – The role for external stakeholders in internal agency staff training is limited.

Experience

Virtually all states with a standing P2 program have implemented training for agency staff. Some training fits under the general umbrella of promoting the integration of P2 into regulatory programs. At a minimum, the training may be a general introduction to P2 concepts. Some states have also developed training on the relationship of P2 to particular topics (e.g., P2 in a MACT standard, P2 in inspections). Experience is mixed as to whether the training is developed and conducted by in-house staff or by outside consultants.

The most typical limitation of state's efforts to train staff in P2 is that early training efforts were highly conceptual and general. Without a specific, identified need for the training and without planned follow-up, many states found that their training efforts led to enthusiastic initial responses from staff, but little concrete follow-up in the form of actual changes to regulatory programs to incorporate P2. As a result, many states have honed their training efforts to tailor them more to specific P2 regulatory integration topics and have built in specific follow-up efforts to ensure implementation.

IP 2

Cul	Rul	\$	FP	Per	Enf	Rep
-----	-----	----	----	-----	-----	-----

Including P2 in Agency Staff Performance

Description

The concept behind this IP is that P2 should be embedded in the tools which measure job performance. This may include modifying staff job descriptions to include P2 components, establishing performance measures that integrate P2, and tying financial incentives and other rewards for employees who undertake P2 efforts. The inclusion of P2 language in agency staff job descriptions and performance evaluations can be considered an IP in itself. It may also prove more effective when practiced as part of implementing a more comprehensive IP. For example, if an agency is implementing IPs such as Supplemental Environmental Projects (SEPs) or having permit writers provide facilities with P2 information (IPs 47 and 31, respectively), the practices can be made more systematic by reflecting them in agency staff job descriptions and performance evaluations.

While it is unlikely that agency policies preclude P2 language in staff job descriptions and performance evaluations, it is important to ensure that implementation of this IP occurs in a way that is consistent with existing personnel policies of the agency. In addition, ensuring that certain employees are not assigned what may be perceived as an unfair additional burden in job assignments is an important issue.

- *P2 Definition* – Restating the agency’s definition of P2 in the actual job description and performance evaluation language ensures its clarity to affected management and staff.
- *P2 Baseline and Metric* – While there is nothing to prevent an agency from including language in staff job descriptions and performance evaluations that is based on a quantifiable prevention metric (e.g., pounds of toxic chemicals reduced per unit of product as a result of the employee’s activities), this would diverge dramatically from current practice and, moreover, is subject to many confounding factors unrelated to staff performance. As a result it is unlikely that any agency would be interested in pursuing such an approach. On the other end of the spectrum is an absence of any type of P2 measurement at all in staff job descriptions and, instead, use of only language that is very general in nature. As mentioned previously, the greater the generality of P2 language in job descriptions, the greater the likelihood it will be ignored, particularly if the job description contains rather specific language on other assignments (e.g., number of permits to be issued.) A middle-ground alternative would be to include P2 language with activity-based measurements (e.g., permit writer will present P2 information at 90% of his/her pre-application meetings).
- *Agency Resources* – Resources needed to ensure that the inclusion of P2 in job descriptions and performance evaluations are small but ensuring their availability is critical to this IP. Funding is needed to train staff and management on the inclusion of new language in job descriptions and performance evaluations, and to have an evaluation as to whether the inclusion of P2 language in job descriptions and performance evaluations did, in fact, lead to P2. If an agency chooses to establish financial award

programs for employees based on P2, funding needs to be made available for such incentives.

- *Institutional Change* – The first consideration in developing this IP is to determine that employee job descriptions and performance evaluations are meaningful tools within the agency. If they are not, this IP is likely to not have a significant impact on P2 regulatory integration. Assuming job descriptions and performance evaluations are meaningful tools within the agency, inclusion of specific, measurable P2 language is likely to be taken more serious by staff and management rather than highly general P2 language. For example, rather than include general language, an agency may consider including language that is directly connected to the implementation of an IP. To illustrate, the implementation of a SEP policy may involve the inclusion of P2 SEP language in relevant staff's job descriptions and performance evaluations. In addition, the inclusion of language that has some type of metric (perhaps an activity-based metric as discussed above) will make the language more meaningful. To ensure that the language is clear and understood by staff and management, some form of orientation is needed that clearly explains what is expected of the employee.
- *Evaluation Component* – Periodic evaluation is needed to ensure that the inclusion of P2 language in staff job descriptions and performance evaluations is, in fact, leading to P2. Including staff in such an evaluation may identify important advantages or disadvantages to this IP.

Implementation Challenges

- *Regulatory/Statutory* – No significant challenges.
- *Financial* – The financial challenges that a regulatory agency may face in implementing this IP involve ensuring that sufficient funds are available to develop, train staff and management on, and oversee the effectiveness of, P2 elements in staff performance. Without such funds for such follow-through, P2 language in staff performance plans likely will be dismissed as a secondary and temporary evaluation criterion.
- *Institutional* – Institutional challenges are the most likely to influence the effectiveness of this IP. Depending on an agency's culture and practice, job descriptions and performance evaluations can be either highly effective tools in prompting core program staff to identify prevention opportunities in their programs, or it can be completely ignored by both staff and management as meaningless compared to the "real" work a staff person is expected to achieve. Particularly in the former case, including P2 language in staff job descriptions and performance evaluations can be an important complement to the effectiveness of other P2 regulatory integration initiatives. It is advisable that P2 language be incorporated in an incentive-based approach in job descriptions and employee performance evaluations and to ensure that the P2 language does not result in the addition of new responsibilities that are not offset by changes in other responsibilities.
- *External* – No significant challenges.

Experience

A review of state practices suggests that the only experience related to this IP are general, non-measurable statements about P2 in employee's job descriptions and establishing employee recognition programs that include P2 as an evaluation component. There seems to be little experience with *specific*, quantifiable P2 task language in agency staff job descriptions or performance ratings, or with tying P2 to merit salary increases. Washington developed a program around several industry sectors; one criteria in staff evaluations was how large the P2 goals were in P2 Plans for companies in their assigned sectors.

Including P2 in EPA Workplan Agreements (both medium-specific workplans and NEPPS agreements)

Description

Many states have made the case that overly prescriptive, medium-specific, end-of-pipe workplan agreements with USEPA can be a significant disincentive to states' efforts to undertake innovative P2 initiatives. To this end, the inclusion of P2 initiatives in states' workplan agreements with USEPA may offer opportunities to earmark federal funds towards a state's prevention activities. This earmarking of funds towards prevention activities may reduce the pollution control requirements of a state agency. It can be taken in either a medium-specific state workplan agreement with USEPA or in a NEPPS agreement that subsumes activities previously included in medium-specific workplan agreements. To some extent, this IP may best serve as a means to an end by being part of an overall strategy for implementation of another IP. For example, if an agency intends to implement an IP, it could reflect its development and implementation of that IP as a commitment in its NEPPS agreement.

- *P2 Definition* – Including the agency's definition of P2 in the workplan agreement with USEPA will allow the state program staff implementing the workplan commitments to be sure of what is expected of them.
- *P2 Baseline and Metric* – To avoid the perception that hard and fast pollution control commitments are being replaced by less tangible P2 commitments, the agency could include a specific P2-related baseline and metrics to use in measuring the impact of including P2 language in the workplan. Clearly, P2 baselines and metrics need to be incorporated into the environmental indicators and goals set in the NEPPS agreement.
- *Agency Resources* – In addition to specific P2 activities the agency is intending to fund via use of federal monies included in the workplan, the agency may request that some portion of the redirected federal monies also be used to track the P2 impact of the renegotiated workplan, including a periodic evaluation.
- *Institutional Change* – Adding new responsibilities for P2 efforts is not likely to be well received by core program staff if the P2 responsibilities are not offset by a reduction in other responsibilities. Therefore, any inclusion of new P2 responsibilities in a federal workplan agreement needs to include some modification to conventional program requirements. In addition, providing instruction and training to core program staff on meeting the new P2 workplan requirements will help to ensure that the P2 requirements are met as intended. Involving core program staff in the development of the new P2 responsibilities is likely to increase their interest in following through on meeting the new requirements.
- *Multimedia Considerations* – There may be opportunities to include P2 efforts in medium-specific federal workplans that promote the consideration of multimedia impacts. Developing a multimedia approach may be easier in a multi-program NEPPS agreement, but can also be considered in medium-specific conventional federal

workplans. Regarding the latter, if the inclusion of multimedia efforts result in additional responsibilities for core programs not governed by that particular workplan, the agency may consider revisiting components of workplans for other affected programs.

- *Evaluation Component* – Evaluating the impact of P2 provisions in NEPPS agreements and conventional federal workplans is necessary to demonstrate whether federal dollars effectively led to P2. Including an evaluation component in the actual workplan agreement helps guarantee that an evaluation will be conducted. Basing the evaluation on actual P2 metrics will shift the focus away from the traditional “bean counting” that state agencies have found counterproductive to P2 and, instead, focus the evaluation on whether actual P2 progress was achieved.

Implementation Challenges

- *Regulatory/Statutory* – A state agency may face challenges when federal monies are legally earmarked for certain types of practices, which may not specifically include P2. In these cases, it is incumbent on the state agency to consider whether prevention approaches could be used to achieve those practices which, in turn, would be reflected in the workplan agreement. There are potential statutory issues in allocating funding generated from one media statute to other media.
- *Financial* – The agency needs to ensure that sufficient funds are made available to include effective P2 components in any federal agreements. Moreover, it must follow through to see that t inertia does not take over resulting in the implementation of conventional practices rather than the proposed P2 practices included in the workplan.
- *Institutional* – Perhaps the biggest institutional challenges associated with this IP include: ensuring that true offsets are included in the workplan agreement so that agency staff can be redirected to prevention work rather than be expected to assume prevention work in addition to their regular activities; contending with core program staff who may feel that the prevention components of their workplans are not their responsibility but rather that of a separate prevention office; committing upper management support to advocate on behalf of the agency in workplan negotiations with USEPA; and guaranteeing that staff are equipped to undertake any new prevention obligations included in the workplan.
- *External* – There may be a perception on the part of external stakeholders, particularly the NGO community, that hard and fast workplan commitments are being replaced by less tangible prevention commitments. These concerns require that the agency ensure that any new prevention commitments included in a workplan with USEPA are, in fact, substantial and measurable. Also, the agency may want to build in regular milestones for the prevention commitments and an overall evaluation of the IP.

Experience

Some states have been successful at renegotiating medium-specific workplan agreements with EPA to offset medium-specific, pollution control requirements (e.g., number of inspections conducted, number of permits issued) with P2 activities. This has provided those states with greater latitude to use funds that previously would have been directed towards pollution control activities to undertake P2 activities, often ones that fall under the rubric of regulatory integration. Regarding NEPPS, several states’ NEPPS agreements with EPA include P2 commitments, for

example, a state agency commitment that integration of prevention concepts into core regulatory programs is a priority. In general, however, the language in NEPPS agreements does not, to date, include much specificity regarding achieving that overall goal.

Instituting Efforts to Measure/Monitor Resources Dedicated to P2

Description

What we measure, we manage. Measuring the effectiveness of resources dedicated to P2 is essential to justifying such allocation compared to other agency priorities. Using a metric such as cost per pound of pollutant prevented or reduced achieves this objective. While this practice may only require upper management directive, its implementation can be difficult since the tracking needs to be developed in a way that is linked to multifaceted P2 efforts. Although it is relatively straightforward, the procedure should be planned carefully because comparisons over time are only useful if the data are consistent from year to year.

- *P2 Definition* - Defining P2 will be integral to measuring resources allocated to P2. A common limitation of agencies' efforts to track resource expenditures to P2 is that, in the rush to demonstrate a significant commitment to P2, any activities even vaguely resembling P2 are counted. To truly monitor resources allocated to P2, it is essential that a clear definition is applied and maintained.
- *P2 Baseline and Metric* - The agency will need to develop baselines and metrics for both the allocation of funds as well as for P2 progress and link the two. If P2 baselines and metrics are not substantial at the agency, a major initiative would be needed to allow for quantitative measurement of funds allocated to P2.
- *Institutional Change* - This practice may help spur institutional change because it highlights the institutional commitment to P2.
- *Multimedia Considerations* - Presumably, many of the resources tallied in this process would come from the various single-medium offices. The coordinator should ensure that each office is submitting uniform, comparable information.
- *Evaluation Component* - The practice itself is an evaluation exercise, and thus would need no additional component to track its progress.
- *Environmental Cost Accounting* - ECA will be an important tool to incorporate so that the environmental benefits of P2 investments per dollar spent are included as well as the costs of implementing P2 measures. *Guidelines for True Cost Accounting* is a good resource for training regulators how to measure P2 resources.

Implementation Challenges

- *Regulatory/Statutory* - No significant challenges
- *Financial* - No significant challenges
- *Institutional* - Agency staff may view this practice as a one-time political exercise rather than a true measure of agency commitment to P2. To make it a standing practice, the agency could consider including it as an item in its annual budget and annual reports.
- *External* - No significant challenges

Experience

Other than simply tracking budgets for dedicated P2 programs and P2 grants, there are few examples of this IP in practice. Pennsylvania is one state that monitors its P2 resources. This practice will likely become more common as more resources are dedicated to P2 in a variety of departments or offices.

Public Reporting on Agency P2 Activities, Achievements, and Statewide Trends

Description

This practice publicizes P2 activities and successes through annual reports, newsletters, or other media. Improving the visibility of P2 programs in this way underscores their importance and sends the message that P2 is a priority. Though indirect, this message will take root and slowly spread until it becomes second nature for agency staff to consider the P2 implications of any new idea. As discussed in the chapter on P2 baselines and metrics, the most comprehensive way to measure P2 progress is through a suite of activity measures (e.g. number of P2-based Supplemental Environmental Projects issued, number of multimedia inspections conducted) and quantitative measures of actual P2. Regarding the latter, states' efforts to quantitatively report P2 results may be limited by the data required to be reported by industry by state and federal statutes and regulations. In most states, the agency will be unable to report reliable data on chemical use/materials accounting and may be limited in their ability to determine the extent to which reductions in pollutants are related to true P2 rather than changes in production. However, states can consider requiring additional reporting from companies participating in voluntary incentives programs to provide more comprehensive quantitative public reporting on P2 results for that population of industry. In addition, a state may consider seeking additional authority to develop a more comprehensive P2 public reporting scheme.

- *P2 Definition* - Defining P2 will be an important part of public reporting because it can be a vehicle for unifying the operating definition of P2 for the audience.
- *P2 Baseline and Metric* - The agency should publicly report on P2 both on an activity basis (e.g., number of workshops conducted, number of P2 assistance site visits conducted, etc.) as well as on an environmental basis (e.g., reductions of certain pollutants from an industrial sector or geographic area). Regarding the latter, baseline will be a key concept in showing how a state is improving over time. Measuring prevention is a difficult task since it requires analysis of how much pollution did not occur in the first place (versus how much was reduced from an existing quantity, as in waste reduction). Measuring overall pollution levels alone is not appropriate because many of the changes in pollution levels will occur because treatment and recycling or plant closings or openings or are otherwise unrelated to a deliberate prevention activity. Thus, a normalizing factor should be used to isolate only those changes that arise due to intentional P2.
- *Agency Resources* - It is possible that the responsibility for this practice can be distributed among existing positions such that additional hires would be unnecessary. The costs of producing an annual report or newsletter are not likely to be restrictive.
- *Institutional Change* - The only institutional changes needed are changes to the job descriptions of a few people in the agency to incorporate explicitly the responsibility for publicizing this information.

- *Multimedia Considerations* - All media should be included in the public reports. Cross-media shifts should be highlighted so as not to ascribe credit for reducing air emissions if water emissions increased proportionately and as a result of media shifting.
- *Evaluation Component* - The practice itself is an evaluation exercise, and thus would need no additional component to track its progress.
- *Environmental Cost Accounting* - ECA will be an essential element of reporting P2 progress. Some of the key metrics that can be used to show the benefits of P2 activities in the state will be based on environmental damage avoided. While some of this information may be qualitative, other benefits can be quantified to demonstrate a benefit/cost ratio.

Implementation Challenges

- *Regulatory/Statutory* - No significant challenges if existing data are used. If the agency intends to develop more comprehensive, quantitative P2 data outside of its existing requirements, new regulatory or statutory authority may be necessary.
- *Financial* - No significant challenges
- *Institutional* - This practice may be viewed as a superfluous exercise by core regulatory programs. To make it more meaningful, the agency could consider having each core regulatory program document its own P2 achievements (both activity and environmentally based) according to a standard format.
- *External* - Both the industrial and NGO community are likely to be very interested in state's efforts to report on P2 progress. In-depth scrutiny of state reporting efforts from both communities is likely.

Experience

Several states have reported P2 progress in some form. One example is Minnesota, which requires annual reports from the Office of Waste Management to address barriers to P2. Other states have included a P2 section in annual reports. Other examples are New Jersey and Massachusetts which have issued quantitative reports on P2 trends in their states.

IP 6

Cul	Rul	\$	FP	Per	Enf	Rep
-----	-----	----	----	-----	-----	-----

Structuring Agency Reinvention Efforts and Partnership Programs with Industry to Include Specific P2 Goals, Components, and Metrics

Description

Following the lead of the federal government, many state governments are critically reevaluating the design and operation of their core programs. As a result of these reevaluations, states are undertaking changes to their core regulatory programs that intend to enhance environmental protection efforts in a way that is less costly to government and the regulated community. In addition, they are undertaking voluntary initiatives with the added intent of rewarding “good actor” facilities or facilities that are willing to commit to a defined level of superior environmental performance. Both types of efforts are typically incentive-based and offer valuable opportunities to integrate P2 into core regulatory programs.

Many of the IPs included in this Compendium lend themselves to such incentive-based programs. Some can be applied by state agencies as the incentive offered to industry while others can be applied by the agency as a requirement that industry must undertake in order to capture the incentive. In fact, balancing a mix of IPs as incentives and requirements can significantly help build a P2 foundation for these incentive-based efforts. Below is a sketch of which IPs may best lend themselves to incentive-based programs either as a regulatory incentive or as a requirement:

Incentives:

- IP 17 Excluding P2 from anti-degradation standards
- IP 29 Relating P2 plans to programs involving environmental management systems
- IP 30 Developing multimedia permits that include a P2 basis
- IP 32 Including administrative incentives in a permit or rule in exchange for the facility undertaking a specific P2 effort and/or achieving quantifiable progress
- IP 33 Fast tracking review of permit modifications for P2 changes
- IP 37 Providing grant or loan programs to assist facilities that are implementing P2 measures as a result of an agency-driven requirement
- IP 39 Establishing broader cap for emissions (e.g., PAL) to encourage operational flexibility that would prompt P2 changes)
- IP 40 Establishing operational flexibility by building in anticipated changes in production, operating scenarios and respective upcoming standards in initial permit
- IP 41 Defining in the up-front permit categories of changes that do not require agency approval

- IP 42 Defining in the up-front permit categories of changes that require lesser agency administrative review
- IP 43 Unifying various reporting from a facility so that it is derived from the same source and so that it uses a P2 baseline measure
- IP 48 Providing penalty amnesty to facilities that agree to achieve compliance via P2 measures
- IP 49 Providing penalty relief in cases where a facility attempted to achieve compliance via a P2 measure that failed.
- IP 50 Extending compliance schedule to allow a facility to achieve compliance via a P2 measure

Requirement:

- IP 20 Including conditions in a permit or rule that require the consideration of multimedia impacts of a single-medium regulatory standard or condition
- IP 23 Establishing standards that require facilities to institute specific P2 approaches
- IP 25 Requiring that a facility develop a P2 plan, the implementation of which is voluntary
- IP 26 Requiring that a facility implement a P2 plan
- IP 28 Relating P2 planning with accident release program planning
- IP 36 Including conditions in permit or compliance settlement for facility to undertake a defined P2 effort
- IP 44 Requiring facilities to publicly report quantifiable data to track P2 progress

- *P2 Definition* - Including P2 as a guiding principle will be a good opportunity to define P2 so that it is not left open to loose interpretation.
- *P2 Baseline and Metric* - In terms of planning reinvention, designing metrics for P2 goes hand-in-hand with a clear P2 definition. Up-front agreement on a P2 baseline as well as on the metrics used to measure progress is a valuable approach to making the P2 portion of incentive-based programs, particularly voluntary ones, more quantifiable. Even if specific P2 goals are not required to be met as part of the incentive-based program, having a quantifiable baseline and metric is essential to monitoring P2 progress and subsequent evaluation of the overall IP as well.
- *Agency Resources* - This practice represents more of a shift in approach rather than a task requiring additional funds assuming some reinvention efforts are already included in the budget.
- *Institutional Change* - This practice is predicated in part on the institutional change that would be occurring anyway as part of reinvention. Including P2 among the parameters that guide reinvention will aid in driving agency culture toward a focus on environmental improvement through prevention.

- *Multimedia Considerations* - The outcome of these incentive based programs may help agencies consider other short-term (e.g., greater coordination among various single-medium programs) and long-term multimedia initiatives (e.g., new organizational designs that are no longer defined by specific media, but rather by toxicity of chemicals, by industry sector, or some other organizing principle) that could be undertaken in the agency.
- *Evaluation Component* - It will be useful to track the performance of industries that enter into agreements with the agency to evaluate the success of the P2 measures. One option the agency could consider is limiting the application of some IPs to pilot efforts through these incentive-based programs and, following an evaluation of their impact, apply the IP on a more institutionalized basis.
- *Environmental Cost Accounting* - ECA plays a key role in prioritizing efforts within this practice to make sure funds spent will have the greatest impact on environmental health. For example, if an agency has to choose between reformulating its reporting requirements or developing multimedia permits, the expected environmental gains per dollar spent should factor into the decision. This assessment would be very difficult for the agency to undertake in significant detail but it would be beneficial for the agency to consider it in some form. Similarly, if the agency is deciding whether or not to require a facility to implement its P2 plan, all the costs and benefits to that facility should be taken into account. In the latter case, ECA could be explicitly written into the partnership agreements.

Implementation Challenges

- *Regulatory/Statutory* - Some actions may require change in statutory or regulatory language. Vehicles to address regulatory/statutory obstacles for such efforts without wholesale regulatory or statutory changes include USEPA's XL program and the more recent "innovations agreements" created between USEPA and the Environmental Council of the States (ECOS).
- *Financial* - No significant challenges.
- *Institutional* - Because roles are already well established in many environmental agencies, changing the operation of programs or the nature of individual staff responsibilities may be met with some resistance. Preemptive measures, such as including representatives from each stakeholder group on decision committees, could increase buy-in and soften the impact of such changes.
- *External* - It is likely that industry will welcome incentive-based approaches but may not initially agree with quantifiable P2 components. Including quantifiable P2 components in these incentive-based programs may provide some reassurance to the environmental community, which may oppose incentive-based programs that do not result in P2.

Experience

A number of states have explored incentive-based programs with the express intent of a P2 result. Not all state incentive-based programs have quantifiable P2 components. State incentive-based programs include P4 permits, pursuing initiatives under EPA's Project XL, Oregon's Green Permits Program, Colorado's Environmental Leadership Program and Michigan's Clean Corporate Citizen.

Agency Reorganization

Description

The conventional structure of a state regulatory environmental agency involves medium-specific branches with functional responsibilities (e.g., permitting, compliance, etc.) Typically, air, water and waste branches are responsible for a combination of tasks such as permitting, rule writing, compliance inspections, and other routine functions. In this typical arrangement, there are few incentives for crosscutting interactions between the medium-specific branches to develop multimedia and P2 efforts. In an effort to transform the agency's organizational structure into one that readily promotes P2 and multimedia interactions between medium-specific programs, some agencies have undertaken organizational restructuring.

- *Institutional Change* – A P2-driven reorganization may be most effective when implemented as a means of achieving another IP. In other words, undertaking a reorganization alone to spur P2 initiatives is not as likely to be as effective as linking it with the implementation of specific IPs.
- *Multimedia Considerations* – There clearly are multimedia issues that need to be considered in an agency reorganization. It may be most beneficial for the agency to consider which IPs are its priorities and what other types of multimedia interactions it wants to achieve and allow these decisions to drive the nature of a reorganization.
- *Evaluation Component* – Agencies rarely evaluate the effect of organizational restructuring after the fact. Perhaps this is because determining that the reorganization did not have the intended impact would call into question whether another disruptive restructuring is needed. Nevertheless, some level of evaluation allows the agency to identify minor “tinkering” in the new structure that would result in a P2 benefit and/or whether there are other efforts (e.g. training) that are needed to complement the restructuring to achieve its full potential.

Implementation Challenges

- *Regulatory/Statutory* – While it is unlikely that any particular statute dictates that it be implemented according to a definitive organizational structure, it is true that existing agency organizational structures have been developed to directly conform with statutory mandates. Legal questions may be raised and need to be explored. But it is likely that an agency will have considerable latitude in this area. Also, some statutory authority specifies the organization of programs and management titles. These may need to be addressed statutorily.
- *Financial* – Reorganizations often result in an indirect financial impact on the agency in the form of temporary reduced employee productivity, physical relocations and establishment of new management arrangements. This is why reorganization proposals should be subject to specific, concrete, and measurable goals, and evaluated on that basis.

- *Institutional* – Reorganization is always disruptive. If the agency has undergone several previous reorganizations, another restructuring can lead to staff skepticism, or worse. As a result, reorganization needs to be well thought out and driven by specific goals rather than merely a hope that housing certain programs together may lead to a P2 critical mass.
- *External* – Agency reorganization is educating external stakeholders as to the purpose and final result of the reorganization.

Experience

There is no standard approach to organizational restructuring. Some agencies have created stand-alone P2 programs that are highly placed in the organization. Others have incorporated P2 programs in larger industry “assistance” programs. Some agencies have established specific P2 mini-programs or contacts in regional offices. A few agencies have combined air, water, and hazardous waste programs under a single branch of the agency. Still other agencies have relocated particular programs in an effort to implement an intended and specifically designed P2 objective (e.g., combine a program that manages TRI data with a P2 program to improve the agency’s ability to track P2 progress). In general, no agency has undergone a comprehensive “overhaul” of its structure. Finally there appears to be no retrospective evaluation of agencies’ experience with reorganization initiatives.

IP 8

Cul	Rul	\$	FP	Per	Enf	Rep
-----	-----	----	----	-----	-----	-----

Conducting P2 Review During Adoption of Regulations

Description

Most state environmental agencies have some type of standard operating procedures in adopting rules and regulations. This IP involves integrating a step in the agency's formal rule-adoption procedure for consideration of P2 issues and impacts. If the agency also has other efforts underway to analyze specific targeted rules for P2 consideration, this IP can be developed as a complementary "backstop" for remaining rules that may not be undergoing the specific P2 analysis.

- *P2 Definition* – To avoid the confusion that is often associated with this issue, a standard operating practice should restate the agency's definition of P2 and should require each P2 rule analysis to clarify how the agency's P2 definition is applied to that particular rule.
- *P2 Baseline and Metric* – Including a quantifiable P2 baseline will allow the agency to determine if the rule had the intended P2 impact over time. To ensure that quantifiable P2 baselines are included in the rule analysis, any discussion in the agency's rule-adoption procedures needs to include clear direction on the inclusion of measurable P2 metrics in the rule analysis.
- *Institutional Change* – To increase the potential for this IP to bring about the meaningful consideration of P2 concepts in the development of rules and regulations, clear and precise direction needs to be outlined in the agency's standard operating procedures for rule and regulation development; the internal responsibility for reviewing the P2 rule analysis language needs to be clearly assigned within the agency; relevant agency staff (e.g., rule writers) need to be advised or trained in the implementation of the IP; and quantifiable metrics need to be standardized for each individual P2 rule analysis.
- *Multimedia Considerations* – Developing a standard operating practice for considering P2 potential in rule development presents a solid opportunity for core programs to consider their impact on other environmental media. Specifically, requiring that multimedia impacts be considered in the P2 rule analysis may be an important component in the agency's rule development standard operating procedure.
- *Evaluation Component* – Evaluating whether the rule achieved its intended P2 impact will allow the agency to best determine whether certain rule components should be revised in future revisions of the rule as well as in development of similar rules. Keeping the evaluation in sync with the quantifiable P2 metrics will allow such evaluation to be more directly meaningful as compared to a highly qualitative evaluation.
- *Environmental Cost Accounting* – IP 24 elaborates on approaches to integrating ECA into a standardized P2 rule analysis.

Implementation Challenges

- *Regulatory/Statutory* – It is unlikely that there are any legal obstacles to adopting a requirement that agency programs consider P2 in the development of a rule or regulation.
- *Financial* – The financial impact of instituting this IP is in the form of staff time committed to its implementation. This expense is not likely to be extraordinary if the IP is integrated into the existing rule development process.
- *Institutional* – The most significant institutional challenge to this IP is making its implementation a serious and routine exercise rather than one perceived as extraneous by core program staff.
- *External* – External stakeholders are privy to the final result of the agency’s rule analysis in the form of a proposed rule. The agency may receive comments on the rule during the standard comment period from external stakeholders, which may or may not be supportive of the P2 analysis in the rule. This will require forethought and preparation to communicate an effective response.

Experience

Several state agencies have modified their rule and regulation adoption procedures to incorporate P2 steps or components. In most cases, these steps or components require the program proposing the rule or regulation to document that they have considered P2 options or how P2 options can be applied to meet the rule or regulation.

Adoption of a Multi-Year Strategic Plan

Description

In the absence or limitation of direct state mandates, some states have opted to develop long range strategic plans for the development of their P2 efforts, in particular, the integration of prevention concepts into core regulatory programs. The intent of such documents is to demonstrate upper management support for a long-range P2 strategy, to make such a strategy more systematic, to increase core program “buy-in” of such a strategy, and to establish some form of accountability within the agency for development of P2 efforts.

- *P2 Definition* – A P2 strategic plan is an ideal vehicle to restate and clarify the agency’s definition of P2.
- *P2 Baseline and Metric* – One of the key ways in which a P2 strategic plan can be made meaningful to the agency is by having its objectives include quantifiable measures of success. All too often, strategic plans include highly qualitative metrics, which may be viewed by core regulatory programs as secondary to their own quantitative performance goals.
- *Agency Resources* – While development of the strategic plan is usually a limited burden on agency resources, implementation of the plan may result in considerable resource needs. Outlining specific resources that will be used to implement P2 elements of the strategic plan will contribute towards making the plan more meaningful and effective within the agency.
- *Institutional Change* – Developing an effective strategic plan within a government agency is always a difficult task; developing components of such a plan that set forth activities that are neither statutorily required nor explicitly funded is even more difficult. Developing P2 components of a strategic plan that are truly viewed by agency mid-management and staff as the accepted agenda for P2 regulatory integration is the greatest challenge facing this IP. Building in the following characteristics to the P2 strategic plan may increase its effectiveness:
 - Involving key core program staff and mid-management in development of the plan
 - Developing highly specific activities to be undertaken to achieve the plan’s objectives
 - Assigning timeframes, responsibilities and priorities for the activities included in the plan
 - Developing strategies for offsetting responsibilities of agency staff who receive new P2 assignments as a result of the plan

A P2 strategic plan may result in the need to revise current agency policies in an effort to ensure consistency. It may be wise for the agency to include an objective in the strategic plan to review agency policies for uniformity with the plan’s objectives.

- *Evaluation Component* – Not only is it advisable for the agency to evaluate the effectiveness of adopting a P2 strategic plan, but it would be valuable for the agency also to evaluate the effectiveness of the specific activities set forth in the plan.

Implementation Challenges

- *Regulatory/Statutory* – No significant challenges.
- *Financial* – Development of a P2 strategic plan will require some dedicated staff resources. More significantly, the plan's effectiveness will be greater if it includes explicit strategies for funding the P2 programs and initiatives that it outlines.
- *Institutional* – The biggest challenge to this IP is development a P2 strategic plan that is taken seriously by core regulatory programs. Agencies should build in mechanisms to ensure that the P2 strategic plan is not viewed as just another vague, general statement with little practical implications, but an instrument for advancing P2 that has muscle and durability.
- *External* – Development of a P2 strategic plan can be a valuable opportunity to, at best, involve stakeholders in plans for P2 in the agency or, at a minimum, keep stakeholders apprised of such plans.

Experience

Several states have developed multi-year strategic plans, which vary in specificity and emphasis. States that have adopted P2 strategic plans generally develop them with the input and involvement of affected agency programs and present them as having top management support. The intent of the plans is to set a longer-term course for the P2 program and, in particular, target areas for P2 regulatory integration. Some states have used their P2 strategic plans as the basis for integrating long-term P2 concepts in NEPPS agreements. It is difficult to determine the extent to which P2 strategic plans have in fact advanced P2 regulatory integration, as those that have been developed are relatively new.

IP 10

Cul	Rul	\$	FP	Per	Enf	Rep
-----	-----	----	----	-----	-----	-----

Establishing Practices for Integrating P2 into Programs that are Designed to Attract New Businesses into the State

Description

State environmental agencies often have the opportunity to participate with other state agencies in economic development programs aimed at attracting or retaining businesses in the state. The environmental agencies' interest in participating in such efforts is to work towards bringing new businesses into the state that are P2-conscious.

The best opportunity to encourage P2 is when a facility is being built or refurbished. For truly new facilities, it would be advisable for an agency to go even beyond P2 regulatory integration to work with a new facility to consider larger "design for the environment" issues that address products, raw materials and life cycle issues rather than traditional P2 planning. Nevertheless, new businesses moving into the state and facilities undergoing significant redesigns offer an opportunity to begin a new regulatory relationship on a positive note. Targeted technical assistance with facility planning and early regulatory contact during the site and equipment selection process gives new businesses both a clear view of their P2 options and an assurance that the regulatory climate is cooperative rather than confrontational.

Land use planning and siting issues are more relevant to new facilities. For example, one strategy in this IP could be to attract P2-savvy businesses to brownfield sites. Putting clean industries where dirty ones previous existed would provide the added benefit of addressing community and environmental justice issues.

The environmental agency may have several approaches to attracting P2-conscious businesses. For example, the agency may offer assistance in facility planning to ensure that new businesses examine their P2 options before making irreversible equipment decisions. Or, the agency might make early regulatory contact with new businesses to start a positive and proactive relationship. A third option is to offer a menu of regulatory incentives (e.g., IP 6) for new businesses that implement P2-based design of their products and processes.

Activities inherent in various IPs that may especially lend themselves to agency efforts to attract new and restructured facilities into the state include the following:

1. Use of materials accounting (normalized to production) to establish a true, multimedia P2-based baseline. An agency could make such a baseline a stipulation for offering an integrated, P2-based reporting incentive to a new facility.
2. Providing permit-based regulatory incentives in exchange for the facility agreeing to a P2 performance level. Permit-based incentives could include more flexible permits through production process-level or facility level caps, anticipation of future facility changes in up-front permits, and identification of changes that do not require agency pre-approvals in up-front permits, "soft landings," etc. The P2 performance level could include: establishing a

level of chemical efficiency, choosing less or non-hazardous raw materials, adoption of normalized, materials accounting measures, adoption of P2-based product specification standards, development of a P2 Plan, etc.

3. Use of environmental cost accounting approaches by the facility in determining product and process design.
4. Development of a P2 Plan or a P2 component of a larger Environmental Management System.
5. Considering P2 in accident release program planning.
 - *P2 Definition* - The state's commitment to P2, and its specific definition, need to be communicated early in the regulatory relationship.
 - *P2 Baseline and Metric* - For a new or refurbished facility, the company should consider all P2 options, then determine what it expects its multimedia outputs to be (normalized to production) and then have that serve as a baseline for future measures.
 - *Agency Resources* - The agency will need to devote staff and technical assistance resources to the task of coordinating with economic development programs.
 - *Institutional Change* - The agency will need to develop competency in marketing itself and its resources to new businesses. Initially, this program would benefit from working within the context of existing state economic development programs for three reasons: 1) those programs are often recognized by industry, 2) they are more experienced in marketing themselves, and 3) it will cast the environmental agencies' efforts truly as designed to attract new businesses.
 - *Multimedia Considerations* - Multimedia concerns should be communicated early in the regulatory relationship.
 - *Environmental Cost Accounting* - Early intervention and a cooperative regulatory relationship can help minimize pollution by encouraging environmentally friendly practices and equipment. Facilities that practice P2 will maximize the total benefits to the state through job creation, investment, and tax revenue net of environmental degradation. Both the state and the facility will benefit from the application of environmental accounting techniques in planning the development of the new facility or upgrading of an existing one.

Implementation Challenges

- *Regulatory/Statutory* - No significant challenges
- *Financial*. Additional funding or reallocation of funds may be required to support the program. However, the program is preventive, so it may help reduce future expenditures on permitting and enforcement. If the state has allocated resources for the purpose of attracting new businesses into the state, the environmental agency could consider seeking a portion of such funding to finance its efforts in this area.
- *Institutional* - To ensure that P2 has a lasting role in the agency's effort to attract new businesses, the agency would first need to determine programmatically how it intends to operate its effort to attract new businesses and, subsequently, modify the factors that will drive the day-to-day operations of that effort to reflect a P2 emphasis. For example, the

agency will need to develop a marketing approach to drive its early contacts with new businesses. Furthermore, it should coordinate its efforts with the other agencies (such as Commerce or Industrial Development) that are involved in cultivating business opportunities.

- *External* - Some businesses seeking to locate in the state could react negatively if the initial contact by the agency is not carefully designed to project a cooperative spirit. In addition, existing business may resent incentives provided to new businesses that are not otherwise made available to existing businesses.

Experience

Some states' environmental agencies are involved in their state's efforts to attract new businesses, but these efforts do not appear to be P2-based.

Establishing Fees that are Designed to Promote P2

Description

For the most part, agencies assess fees for the purpose of revenue generation. Environmental regulatory programs assess fees in several different ways. Some typical ways include those that are based on: the level of effort applied by the agency in providing a service (e.g. permit review); the type and size of the facility's operations; or the use/inventory/input of materials; the quantity of environmental release; the nature of hazard posed by a pollutant or operation. This IP involves using fees to promote P2, an example of a broader class of "ecological taxes" that has attracted much policy attention in recent years. This may occur, for example, by basing a fee on a measurable end-of pipe quantity (multimedia or single-medium releases); basing a fee on the efficiency of an operation; or allowing for fee reductions when P2 is undertaken.

Under the existing regulatory regime, generating pollution incurs direct and indirect costs due to the control technology that must be installed, the permits that must be negotiated, the risk of fines if any laws are violated, and the cost of hiring waste management contractors or developing internal waste management expertise. However, these costs are not always easily visible to managers, and they are not always directly correlated with the quantity of pollution. Pollution fees, by making a clear connection between the quantity of pollution and the fee paid, enhance not only the magnitude of the price signal, but also its visibility. Ideally, fees should reflect the harm caused by pollution. For example, fees can be differentiated geographically to help protect sensitive areas, to encourage extra P2 effort in non-attainment areas, or to target particularly toxic, bioaccumulative or persistent pollutants. Fees will always be a politically charged issue and some fee approaches would be so contentious, it would render their development impossible, such as basing a fee on the efficiency of an operation; at a level higher than what is needed for program revenue in order to create a P2 incentive; or on the external costs of environmental damage.

- *P2 Definition* - Fees should be structured in accordance with the definition of P2. Thus, a source reduction-based definition of P2 would be levied on releases, transfers, fugitive emissions, and on-site disposal so that preventing pollution is rewarded. Good waste minimization practices that do not fall under the rubric of P2, such as some forms of recycling, should not be unfairly penalized.
- *Institutional Change* - Pollution fees are often hobbled by conflicting purposes. Though fees are a policy instrument by themselves, they also raise revenues. Typically, the revenues from fees have been earmarked for a particular environmental program. Though the program itself may be beneficial, the earmarking of fee revenues is harmful for several reasons. First, the program's funding becomes dependent on the fee revenues, while the fee revenues are intended to decline over time as pollution is reduced. Second, the appropriated funding level for the program may limit the magnitude of the fees. Third, fees that are not offset by reductions in other taxes—i.e., are "revenue-neutral"—represent a politically unpopular expansion of the government sector. The best use for fee revenues may be offsetting other state taxes, allowing the fees to be set according to their

effect on the quantity of prevented or preventable pollution rather than with regard to the funding needs of a particular program.

- *Multimedia Considerations* - To avoid encouraging cross media transfers, fees should be levied on as many forms of pollution as possible, in proportion to the risk. Otherwise facilities face incentives to shift to the medium without fees.
- *Evaluation Component* - Fees need to be evaluated carefully to properly calibrate them. If they are not having the intended effect of reducing pollution, it may be necessary for the fee to be raised. Once calibrated, they need to be revised periodically in light of changing environmental conditions, market conditions, and scientific knowledge.
- *Environmental Cost Accounting* - ECA guidance and technical assistance to facilities can help them understand the true cost of pollution and the economic benefits of P2 and the effect of pollution fees on the bottom line. ECA can also play a role in setting the magnitude of fees based on the estimated value of the damage that pollution causes.

Implementation Challenges

- *Regulatory/Statutory* - Fees typically require statutory authority, and in most cases current state authority for setting fees directs the agency to assess fees for the purposes of operating a specific program. It is likely that new statutory authority would be needed to develop a new P2-based fee as discussed in this IP.
- *Financial* - Enforcement efforts may be costly. However, the fees can be set quite high in order to call attention to the connection between pollution levels and fees, as well as to cover program costs. Nevertheless, political acceptability may be a formidable obstacle.
- *Institutional* - Will require institutional effort to develop appropriate data systems, enforcement mechanisms, and a fee schedule.
- *External* - Regulated industries may strenuously oppose fees, while clean industries that stand to benefit from reduced taxes (if fees are designed to be revenue-neutral) may offer strong political support.

Experience

A number of states have adopted quantity-based fees, including Louisiana, Massachusetts, Minnesota, and Washington. However, these fees are not necessarily designed to drive P2; rather, they are developed for program revenue purposes.

IP 12

Cul	Rul	\$	FP	Per	Enf	Rep
-----	-----	----	----	-----	-----	-----

Imposing Penalties that are Designed to Promote a P2 Response in Achieving Compliance

Description

In this IP, an agency would structure its violation penalties to reflect a P2 requirement or incentive to conform to a P2 metric. Ways in which the agency could approach this practice include:

1. When the agency assesses penalties against violators, it can base the penalty on an appropriate P2 metric. The P2 metric would need to be set in a permit or other binding agreement. For example, the penalty could be based on the quantity by which the facility exceeded a non-product output baseline that was set in its permit.
2. Reducing a penalty in exchange for a defined P2 effort on the part of the facility. This is the basis for Supplemental Environmental Projects (SEPs) in IP 47.

Like fees (IP 11), creating new bases for the assessment of penalties is a highly contentious issue. There are certainly some approaches to penalty assessment that are politically impractical.

- *Institutional Change* - The agency would need to modify any penalty formulas to reflect the P2 component. In addition, any linked regulations or standard operating procedure would need to be modified.
- *Multimedia Considerations* - The penalty should take multimedia effects and cross-media transfers into account.
- *Evaluation Component* - Following trends in facility-level P2 that result from this practice.
- *Environmental Cost Accounting* - The amount of the penalty could be based on a multiple of the (monetized) environmental damages caused by the violation.

Implementation Challenges

- *Regulatory/Statutory* - Penalty amounts may be subject to existing regulatory and statutory guidelines.
- *Financial* - The agency may need to adjust its projections of revenue from penalties.
- *Institutional* - No significant challenges.
- *External* - No significant challenges.

Experience

None, with the exception of state experience with Supplemental Environmental Projects described in IP 47.

Reallocating Existing Agency Resources to Fund P2 Efforts

Description

In many state agencies, core program funds are from highly prescriptive sources, such as federal grants and state legislation. In addition, many state P2 programs do not have specific or stable sources of state or federal funding. As a result, some state agencies have implemented approaches to redirect core program funds to P2 efforts. The intent of this redirection of funds is either tied to meeting the core programs' requirements through prevention means or simply strengthening the agency's overall P2 program. Naturally, when federal dollars are involved, this IP is directly linked to IP 3 in which P2 is included in workplan agreements with USEPA both through the renegotiation of medium-specific workplan agreements and through NEPPS.

- *Institutional Change* – One big challenge an agency will face in reallocating funds to P2 activities is to use the reallocated funds to develop lasting and systemic P2 efforts rather than short-term, piecemeal P2 activities. Some measures that an agency can take to bring about more effective, long-term P2 efforts as a result of reallocated funds include:
 - Having individual P2 activities fit into an overall long-range P2 regulatory integration strategy as discussed in IP 9
 - Developing individual P2 activities that have measurable results so that the value of the reallocated funds can be quantified
 - Involving affected programs (particularly those whose funding is being tapped) in planning the reallocation of funds and perhaps having a written agreement among the affected programs
 - Demonstrating upper management commitment to the reallocation of funds and documenting a clear understanding of why the funds are being reallocated and for how long
- *Multimedia Considerations* – Reallocating funds to multimedia P2 activities may provide an opportunity for reallocation from more than one medium-specific program, thereby promoting collaboration among the programs that are providing funding.
- *Evaluation Component* – Building in a formal evaluation component may make this IP more palatable to the program whose funds are being reallocated. The formal evaluation will make it understood that an evaluation of the funds reallocation will take place in a given period of time. In doing so, the contributing program may be reassured to know that if the evaluation documents a negative result, then funds will be reinstated.
- *Environmental Cost Accounting* – ECA can be a good technique for prioritizing spending to ensure the greatest environmental and health benefit for each dollar spent.

Implementation Challenges

- *Regulatory/Statutory* – State agencies may find legal obstacles to redirecting core program funds to non-core P2 programs as a result of legal language earmarking funds

for specific program purposes. However, it is unlikely that there would be legal obstacles to using core program funds to finance efforts to meet core program obligations through prevention purposes.

- *Financial* – This IP involves funding additional agency activities from a fixed resource pool, a situation that inevitably requires difficult trade-offs.
- *Institutional* – The biggest institutional challenge to this IP is to provide funding to bring about meaningful and lasting P2 regulatory integration, rather than funding for inconsequential, “flash in the pan” P2 activities.
- *External* – It is likely that those parties that contribute funds to the state agency for P2 purposes (e.g., other state agencies, federal agencies) will have an interest in how the funds are being reallocated and the results of such reallocation. The agency’s efforts will benefit by briefing these external funding sources of the development of this IP.

Experience

States have tried a variety of ways to redirect funds earmarked for other programs to P2. The most ambitious attempts have been through renegotiations of medium-specific grant agreements with USEPA through which a certain portion of the grant monies are directed towards achieving the program’s requirements through prevention. Equally ambitious will be states’ attempts to use the P2 component of their NEPPS agreements to redirect funding previously earmarked for medium-specific core programs to P2 efforts. The most typical efforts underway in states are less formal and involve internal agreements to allow some amount of core program funds to subsidize P2 staff salaries or specific P2 activities. These agreements generally require approval at the upper management level.

IP 14

Cul	Rul	\$	FP	Per	Enf	Rep
-----	-----	----	----	-----	-----	-----

Providing New Funds for P2 Efforts through State General Funds

Description

Only a small number of states have appropriated state monies for P2 programs through state general funds. A large majority of states rely on federal grants and reallocated monies from other programs to finance their P2 efforts. Nevertheless, providing funds for agency P2 programs through state general funds is still a potential IP to explore even in this era of shrinking state government agency resources.

- *P2 Definition* – Ensuring that the definition of P2 governing the new state monies is consistent with any existing P2 definition in the agency is important to ensure consistency and to ensure that there are no misunderstandings as to the appropriate use of the money.
- *Institutional Change* – Developing a vision for how new state monies can be applied to P2 regulatory integration efforts may increase the likelihood that the agency will be allowed to use new state funds for P2 regulatory integration in addition to other statutorily mandated P2 activities. For example, the development of a long-term plan for P2 in the agency may help to present a clear picture for why new funds are needed and how they would be spent.
- *Environmental Cost Accounting* – ECA can help prioritize spending to ensure the greatest environmental and health benefit for each dollar spent at the agency level, and to help target sectors and processes with the highest benefit/cost ratio for P2 improvements.

Implementation Challenges

- *Regulatory/Statutory* – No significant challenges.
- *Financial* – No significant challenges.
- *Institutional* – If new state dollars are made available for P2 efforts through legislation, it is likely that the funding would be connected to new P2 responsibilities for the agency such as the creation of a P2 planning or technical assistance program. The challenge to the agency is using the funds to implement the new P2 responsibilities while also making funds available for P2 regulatory integration efforts. If the new state dollars are made available for P2 efforts through other mechanisms (e.g., priority package in the state budget), the agency may have more latitude to determine how to apply the funds to P2 regulatory integration efforts.
- *External* – It is likely that external groups (e.g., NGOs, industry associations) may play some role in advocating for the availability of new state monies for P2 efforts. It will be a challenge for the agency to meld its vision for how the funds can best be used with visions expressed by such external groups.

Experience

For the small number of state agencies that do receive stable P2 funding via the state fund, the way in which the funding is structured varies. States with general P2 funding, for example, receive the monies to implement a state level P2 statute that mandates a P2 planning program.

IP 15

Cul	Rul	\$	FP	Per	Enf	Rep
-----	-----	----	----	-----	-----	-----

Basing Decisions Regarding Size of New Treatment Systems on Anticipated Impact of P2 Measures

Description

Some decisions made by environmental agencies are based on assumptions that a certain level of treatment or disposal capacity is needed by facilities that generate a particular waste stream. This IP entails using the decision-making process about the capacity of such operations as a driver for either the agency or the facility to analyze P2 opportunities as a waste reduction approach. One approach is for the agency to require the facility to document that it has studied P2 options as part of determining the level of capacity needed for the operation, be it on-site or off-site. Another, more heavy-handed approach, is for the agency to approve the operation contingent upon certain P2 measures.

This IP also provides valuable opportunities for cross-program coordination here. Different medium-specific core programs have different regulatory processes for determining the appropriate size of a treatment system. For example, the air program is likely to have some type of one-step preconstruction requirement while the water program may have a two-step discharge allocation certificate and treatment works approval requirements. The programs can look to find a approach in which their reviews are coordinated and jointly focused on P2.

- *Institutional Change* – Developing this IP through a standing rule or regulation will increase its implementation as an agency practice rather than a highly individualized approach that may be applied to facilities only in certain instances. A rule or regulation could dictate in what instances P2 considerations will be built into capacity decisions and what agency actions may take place as a result.
- *Multimedia Considerations* – Even though the agency’s capacity decision is likely being made for a pollutant associated with a single environmental medium, it may be advisable to have the guidelines also consider possible multimedia transfers. In doing so, the agency may avoid reducing capacity needs in one area but increasing them in another.
- *Environmental Cost Accounting* – This IP provides a valuable opportunity to have a facility consider the financial benefits of P2. A basic ECA can be included in the P2 considerations developed by the facility in reviewing its capacity needs.

Implementation Challenges

- *Regulatory/Statutory* – A facility may challenge an agency’s authority to require the consideration of P2 in capacity considerations. The agency may be able to rely on authorities in medium-specific rules or laws, or on the general enabling authority of the agency, to require such activities. Another alternative is to work cooperatively with industry groups to develop a regulatory approach that clearly spells out the conditions under which the agency will consider P2 in capacity decisions.

- *Financial* – Resources are needed to design and implement this IP, including, for example, staff time to draft language, meet with business, and develop/review disposal facility proposals.
- *Institutional* – The institutional challenge to this IP is implementing it in a way that is systematic and lasting rather than *ad hoc* and individualized for certain facilities.
- *External* – Individual facilities may object to being “singled out” if this IP is not implemented in a systematic fashion. Working cooperatively with industry groups to develop this practice will result in broader acceptance of the concept. While NGOs are likely to think more positively of this IP than industry groups, involving the NGOs may help them to understand the practical limitations of its implementation.

Experience

In the past, agencies typically accepted the level of capacity that a facility requested as long as that level was within regulatory limits. Now agencies are beginning to prompt facilities to consider P2 approaches as part of applications for permits, certificates, registrations and other approvals. These efforts are typically in the form of assistance during the application process (see IP 31) rather than requiring a formal capacity plan based on P2 or issuing an agency determination intended to drive P2. As part of statewide capacity assurance plans, states have considered the effect that P2 may have on statewide hazardous waste treatment needs. Other efforts on the part of states to integrate P2 into capacity decisions, either on the statewide or individual facility basis, appear to be less systematic.

Designing Bankable/Tradable Emissions Credit Programs as Drivers for P2, Including Giving Credit to Facilities Who Retire Credits Gains through P2 Measures

Description

Emissions trading programs work by having the agency establish a finite limit to the total allowable emissions (usually, but not always, air) in a given area. Some view this as a means of establishing property rights to common resources, such as clean air and water. Facilities are issued permits that grant them the right to emit some portion of the total, but are allowed to buy and sell that right to emit to other facilities (or to third parties). For example, if a facility is able to reduce its emissions inexpensively, it may find it economical to sell its pollution credits. In contrast, a facility out of compliance may prefer to buy credits from a facility capable of low-cost reductions rather than invest in P2 or abatement equipment. (Note that emissions trading generally does not distinguish between prevention and treatment.) The aim is to achieve a certain air quality standard at the lowest cost by letting the market decide the most economical means to an end.

While tradable emissions programs do not lead to P2 directly, they are likely to achieve some P2 simply by making compliance more affordable and by making more stringent pollution caps more feasible (economically and politically). In addition, over time, the agency may choose to retire or buy back pollution credits, thereby lowering the ceiling of potential emissions and encouraging P2. Thus, the program provides a vehicle for achieving P2 while also encouraging economic efficiency.

However, emissions trading does provide certain opportunities to focus on P2. For example, there is a built-in incentive for companies to reduce emissions lower than the level required by law because they can sell the remaining credits. But if an agency were to provide additional incentives, in the form of regulatory flexibility, tax credits or other means, to encourage such companies to bank those credits rather than selling them, then P2 may be achieved. P2 can also be encouraged by carefully defining the quantities over which emission reductions are measured to prevent cross-media transfers from being counted as reductions. Another P2 opportunity is to set up a cost share fund using participation fees, credit auction revenues, or the fines for exceeding allowable loads. The fund could provide money, for example, for addressing nonpoint source pollution or loans to small businesses for P2 technologies.

- *P2 Definition* - Because emissions trading programs typically do not distinguish between treatment and prevention, having a solid P2 definition could encourage the program to consider a P2 credits trading program rather than an emissions credits trading program. Barring that, a P2 definition will still be important to the design of the trading program.
- *P2 Baseline and Metric* - A proxy for the level of P2 achieved through this program will be the overall emissions cap, which could possibly decrease over time.

- *Agency Resources* - Because facilities can trade emission permits at any time, the agency must invest in information systems that can track the permitted quantities at every regulated facility.
- *Institutional Change* - Emissions trading is inherently a quantity-based regulatory mechanism, so it may conflict with technology-based regulation that gives every facility a right to pollute if it installs some particular technology. It also may conflict with the traditional permitting process in which standards are often based on concentrations of pollutants rather than quantities. Institutional changes will need to accommodate these differences.
- *Multimedia Considerations* - Facilities should not be allowed to generate surplus permits or emissions credits by transferring emissions to different media.
- *Environmental Cost Accounting* - The burden of cost assessment devolves to individual facilities under a permit trading system. If trading is effective, the price of permits should approach the true marginal cost of reducing pollution. Guidance and technical assistance on ECA can help facilities realize these savings.

Implementation Challenges

- *Regulatory/Statutory* - Tradable emission credit systems at a minimum require regulatory changes and approval by USEPA. They may also require new statutory authority.
- *Financial* - There are certain start-up costs to get a tradable permits program operating. Further, it is possible that inspections will need to increase.
- *Institutional* - Tradable permits constitute a new approach to handling pollution, i.e., a market-driven rather than command-and-control one. Accordingly, there likely will be a period of agency adjustment in terms of core program staffing and work plans.
- *External* - Environmental groups do not always approve of emission trading systems, on the objection that they institutionalize a “right to pollute.” However, industry is likely to look favorably on the potential cost savings.

Experience

Few states have adopted tradable permit or emission reduction credit (ERC) systems, although USEPA has done so successfully with power plant SO₂ emissions and the gasoline lead phase-out. North Carolina has implemented a tradable permit system for nutrient loading in a “nutrient sensitive” coastal water basin. The system included a Cost Share Program that collects participation fees and additional fees from all participants if the target is exceeded. In addition, Michigan DEQ has proposed a tradable ERC system, currently operating under conditional approval by USEPA, for criteria air pollutants, and Connecticut DEP has a tradable ERC system for large NO_x sources.

Incorporating P2 Techniques into Anti-Degradation Standards

Description

Most pollution control statutes and regulations establish numeric compliance standards. In some programs, these numeric compliance standards are complemented by additional qualitative requirements that dictate that, regardless of the numeric standard, a regulated entity is not allowed to further impair environmental quality. In these situations, the regulated facility may be required to go beyond the numeric compliance standard and achieve a level of environmental protection that protects the environmental integrity of a defined environmental area, e.g., a specific body of water or watershed.

Integrating P2 into these types of regulatory programs may involve several approaches including:

- Defining the environmental degradation on a multimedia basis
- Allowing for an extended schedule to meet the qualitative environmental quality standard via P2 measures.

It would be difficult, however, to implement these approaches without potentially increasing permit limits and/or releases. As such, P2 would not occur and negative environmental impacts may be the result instead. This would certainly lead a state agency to avoid such an approach.

It may be possible, however, for an agency to develop this IP in a way that does not change permit limits or standards but, instead, provides opportunities for greater coordination between the air and water programs. In both air and water, there are regulatory points that dictate the development of acceptable standards (see figure below). An agency could consider identifying pollutants of concern in both air and water and coordinate the development of such standards so as to provide benefits to the other media as well.

- *P2 Metric* – Since this IP may provide opportunities for coordination between air and water permitting, the agency could consider the development of metrics that take into account this coordination and that are normalized for production.
- *Institutional Change* – Any change to anti-degradation requirements would need to be reflected in program regulations and accompanying documentation.

Implementation Challenges

- *Regulatory/Statutory* – There are likely to be considerable legal obstacles to this IP.
- *Financial* – Legal challenges that the agency may face would be costly.
- *Institutional* – This IP would need to be reflected in agency strategic plans, program mandates, and staff job descriptions.

- *External* – The environmental community is likely to support this IP because it strengthens the ability of an agency to push a facility towards qualitative environmental improvement.

Establishing P2 Connections in Regulations Between Environmental Standards and Requirements for a) Occupational Health and Safety and b) Transport of Hazardous Materials

Description

In its most extreme form, this practice would involve changes either to regulations or statutes across multiple agencies within the state government. The changes would ensure that limits set for occupational health and safety and for transportation are compatible with and reinforce P2 goals while simultaneously reducing risks for people who work with and transport toxic substances. Such reform is dependent on the belief that toxic substances should be treated consistently across agencies. Consistent treatment translates into common lists of toxic substances, common definitions for key terms, such as “hazardous” and “toxic,” and common thresholds for reporting. Cross-cutting policies that serve to coordinate these efforts will facilitate P2 because facilities will not receive conflicting messages about how to handle toxics, and transfers of toxics from environmental media to other exposure routes would be discouraged.

An agency may elect a more modest effort to achieve more coordinated oversight of toxics in the environmental, occupational, and transportation realms. The state agencies that oversee environmental protection, transportation safety and occupational health could voluntarily sign Memoranda of Understanding to undertake some coordinated efforts. Some possibilities include:

1. Notifying each other when toxics are added or eliminated for regulatory coverage
2. Referring to each other’s appropriate programs when conducting technical assistance to industry
3. Stressing environmental cost accounting, which would consider all impacts of toxics (health, safety, environment, etc.) in outreach materials and interactions with industry
4. Joint inspections for targeted toxins, sectors, or geographic areas
5. Expanding environmental agency efforts to provide single point-of-entry compliance and permit assistance to industry by working cooperatively with representatives of transportation safety and occupational health agencies
 - *P2 Definition* - Clarifying a consistent definition of P2 that all departments or agencies can agree on will be a critical step.
 - *Agency Resources* - This practice will have benefits for all relevant departments (environment, health and safety, and transportation), so each ought to contribute to the funding.
 - *Institutional Change* - Individual agencies may not be accustomed to considering the needs and priorities of other agencies. A joint task force should make recommendations as to how to find common ground.

- *Environmental Cost Accounting* - The cost savings from reducing the use of toxics, improving worker safety, and lowering the number of vehicular accidents involving transport of toxic substances should be quantified so that the benefits can be explicitly compared to the costs.

Implementation Challenges

- *Regulatory/Statutory* - Regulations or statutes that span multiple agencies will introduce complications such as trying to conform to different operating styles and different missions. It will be an order of magnitude harder than, for example, reaching consensus among single media offices within a single agency. In addition, there are several court cases agreeing with OSHA preemption over environmental requirements. This could also pose a significant challenge in implementing this IP.
- *Financial* - No significant challenges.
- *Institutional* - There is a likelihood of institutional resistance to the idea of jointly implementing a rule or coordinating regularly with another agency.
- *External* - Industry may object to efforts to better coordinate the regulation of toxics among the environmental, occupational and transportation agencies owing to the perception of over-regulation and over-intrusion on the part of government.
- *Policy* - No significant challenges.

Experience

This idea is essentially untested. In New Jersey, state P2 rules specify that P2 practices cannot include those that transfer pollutants or risks to workers, products or consumers, but there is nothing to link the various agencies' activities together explicitly.

IP 19

Cul	Rul	\$	FP	Per	Enf	Rep
-----	-----	----	----	-----	-----	-----

Basing a Regulatory Standard on Restriction or Phase-out of a Specific Chemical or Raw Material

Description

While outright chemical bans generally are outside the purview of state agencies, states can and do use authorities under core programs to adopt standards that may limit or prohibit the use of certain materials in specific industrial operations. Such practices may restrict certain materials as part of best management practices or as a defined technology-based standard. The effect, if not always the intent, of such practices is to drive the use of more environmentally acceptable materials inputs. Another less extensive approach could be for an agency to establish regulatory standards and limits that provide incentives for P2-based chemicals or raw materials. For example, states may establish different air limits for water-based coatings than for coatings that release VOCs.

- *Institutional Change* – Developing this IP in a way that is more systematic rather than case-by-case may best be achieved through rule adoption. Doing so will not only provide the agency with an opportunity to clearly detail the intent and structure of the IP, but building the Practice into a rule may help systematize its use by agency staff. A regulatory approach to this IP does not necessarily mean that it will result in mandatory restrictions of a material. Another alternative is to require the agency to consider whether material restrictions would be an effective approach to new environmental standards.
- *Environmental Cost Accounting* – The economics of material substitution will benefit from environmental cost analysis. While there may be up-front costs to switching technologies, they could be offset in the long run by lower treatment and hazardous waste disposal costs as well as other direct and indirect savings. Agencies may use ECA to motivate industry participation.

Implementation Challenges

- *Regulatory/Statutory* – While it is highly unlikely that a state would have explicit statutory authority to restrict material as part of an environmental standard, states have other authority within core programs with which to execute this IP. If an agency intends to develop this IP in a way that is based on a generic protocol, rather than on a case-by-case basis, it is likely that doing so would best be done through rule promulgation. This approach would clearly delineate the agency's P2 intent, its legal basis for the practice and allow for public participation.
- *Financial* – Resources needed to implement this IP are likely to be limited to staffing costs.
- *Institutional* – The institutional challenge facing this IP is developing it in a way that allows routine *consideration* of its use, while not necessarily its actual implementation.

In other words, the agency would have in place a standard operating practice and protocol to assess chemical phase-outs if they are warranted. This avoids the pitfall of reacting on an *ad hoc* basis in a hurried fashion to chemical controversies after they emerge.

Many state agencies have articulated a policy to limit P2 regulatory integration to voluntary initiatives. These agencies may believe that this IP is contradictory to such a policy and, instead, rely on efforts to encourage facilities to consider the environmental and financial benefits of using more environmentally acceptable materials.

Extensive effort would need to be put into identifying which chemicals should be addressed through this approach. The agency will need to determine some technical (e.g. risk-based) criteria for determining which chemicals or raw materials should be addressed through this IP.

- *External* – Interest from the NGO community in development of this IP likely will be substantial. However, resistance from industry also is highly probable. Both groups, however, may be supportive of an incentives-based approach in which standards are set that favor P2-based chemicals and raw materials.

Experience

State core programs, particularly air quality regulations, have considered restricting materials as a regulatory strategy. For example, limiting use of certain solvents for degreasing in order to drive the use of water-based materials is a practice that may be employed by a core program as part of a best practice or technology-based limit. State industrial assistance programs take a softer approach by providing facilities with guidance on the environmental and business benefits of materials substitution. Identification of this practice as a P2 regulatory integration option is sometimes included in state P2 training

Including Conditions in a Rule or Permit That Require the Consideration of Multimedia Impacts of a Single-Medium Regulatory Requirement

Description

This IP involves using single-medium permits or rules to require industrial facilities to determine whether an agency-imposed action by the facility results in any multimedia impacts. Two basic approaches are possible: one in which the facility has complete responsibility for assessing and dealing with the cross-media shift; and the second in which the agency works cooperatively with the facility to address any cross media shifts. The latter approach is definitely more desirable because, if cross-media shifts are identified, the agency would want to work with the facility to address them. An example of this approach could be where the agency includes conditions in an air quality permit that require a facility to study whether installation of a treatment device to meet permit limits results in a transfer of air pollutants to another environmental medium. While this practice, by itself, may not necessarily lead to P2, identification of cross-media transfers may lead to P2, particularly if P2 is required or advocated as an approach to address the cross-media transfer.

The agency could also develop approaches for how cross-media transfers should be addressed. One approach would be to impose further conditions in the permit or rule for the facility to take action to address the cross-media transfer. Another approach would be to develop an agency practice in which core regulatory programs bear a responsibility for addressing the cross-media transfer identified by the facility. The nature of any follow-up approach would depend on how prescriptive the agency wants to be. For example, one agency may choose to rely on identification of the cross-media transfer to, in itself, promote a P2 response. Another may require a certain type of action on the part of either its core regulatory programs or the facility following identification of a cross-media transfer.

- *P2 Definition* – Since cross-media considerations drive P2 in this IP, the agency may want to clarify in any documentation for this IP what P2 is and how it can be applied to address identified cross-media transfers.
- *P2 Baseline and Metric* – Establishing a multimedia, P2-oriented baseline and metric may prove to be essential to the facility’s ability to identify cross-media transfers and allow the facility and agency to determine whether any cross-media transfers were addressed via P2 approaches.
- *Institutional Change* – Agencies may consider initiating this IP on an individualized, case-by-case basis. The limitations to such an approach are that it will not result in lasting change in how the core programs operate. As a result, a more systematic approach, such as development of the IP through a rule, is likely to increase the effectiveness of this IP.

The agency may choose an approach by which core regulatory programs are expected to take some type of follow-up action once a cross-media transfer has been identified by a facility. Development of this follow-up approach may need to be detailed in agency policies and procedures.

- *Environmental Cost Accounting* – If, through this IP, the facility realizes the benefits of P2 over single-media, end-of-pipe options, the agency may urge the facility to consider the less tangible benefits to increase a facility's enthusiasm for P2.

Implementation Challenges

- *Regulatory/Statutory* – It is possible that a facility might challenge an agency's authority to implement this IP if it is done in a piecemeal fashion. Such concerns will be mitigated if the practice is implemented in a systematic fashion, i.e., if the agency develops the practice as part of a regulatory initiative.
- *Financial* – Agency resources needed to implement this IP would be for staffing purposes.
- *Institutional* – The IP may be practiced on a case-by-case, rather than systematic, basis within core regulatory programs in the absence of a concerted effort by the agency.
- *External* – Industrial facilities may object to the additional work created for them by this requirement. If done on a case-by-case basis, an individual facility may feel singled out and object to having the requirement imposed upon them but not their competitors.

Experience

Several states have initiatives underway in which multimedia considerations are considered. In addition, USEPA's Source Reduction Review Program and some air regulations are requiring consideration of multimedia impacts.

Including Specific P2 Components in Agency Organizational Reviews

Description

A number of state environmental agencies have undergone reviews of their organizational practices in an effort to increase operational efficiency. These reviews are often undertaken with input from outside management consultants. The result of these organizational reviews typically is streamlined operating practices, upgrades to information management systems, and reductions in regulatory burden. Due to the comprehensive nature of these organizational reviews, they present a valuable opportunity for agencies to integrate P2 concepts into core regulatory programs. Organizational reviews commonly involve mapping the processes that core regulatory programs follow for the purpose of considering how to improve the efficiency of those operations. The agency could use these process mapping steps to also identify opportunities for integration of P2.

- *P2 Definition* – This IP can be developed in a way to systematically integrate P2 into core regulatory programs. However, without a clear P2 definition, an agency could include components in its business organizational reviews in the name of prevention that, in practice, contribute little or nothing to implanting P2. Developing and documenting a clear definition of P2 as part of the organizational review helps avoid this situation.
- *Institutional Change* – As with other IPs, the results of this IP will have a more lasting impact if they are developed in a way that changes the underlying drivers of core programs. While underlying drivers may not be affected for all of the P2 components of the organizational review during the time of the review, the agency can develop a plan and agenda for doing so. Since an agency organizational review is likely to result in changes to policies and practices of a variety of programs, modifications may be needed to implement the P2 components of the organizational review.

Implementation Challenges

- *Regulatory/Statutory* – There may be legal challenges to implementing specific P2 components of an organizational review. However, since it is often necessary to consider legal issues related to non-P2 initiatives identified, legal issues related to P2 components may be evaluated at the same time.
- *Financial* – Some agencies have allocated large sums of money to undertake comprehensive organizational reviews. Thus, the addition of P2 components is likely to be a relatively small incremental cost. The level of funds needed may vary based on the scope of the P2 components considered. Funding would be needed for agency staff involvement and, if relevant, for outside consulting services and eventual implementation.

- *Institutional* – The institutional challenge is developing P2 regulatory integration initiatives in a way that changes the underlying factors that drive the operation of core regulatory programs, e.g., resource allocation, staff workplans, rewards/incentives.
- *External* – Agency business organizational reviews that are comprehensive tend to include efforts to solicit input from external stakeholders. These efforts could be expanded to solicit external stakeholder involvement on development of P2 components as well.

Experience

Building a P2 component into an agency organizational review allows the agency to consider much different P2 regulatory integration options, including the IPs outlined in this compendium. Several states have used organizational reviews as an opportunity to consider P2 regulatory integration opportunities. In those cases, P2 regulatory integration became an additional objective of the review.

Defining an Enforceable Standard to Either be P2-Based or P2-Preferential

Description

Environmental standards are of three general types: technology-based standards; health and environment-based standards; and management practice-based standards. Standards have the potential to drive systemic P2 regulatory integration because they are one of the underlying drivers of core regulatory programs. There are different approaches to developing standards such that they indirectly reflect P2 without dictating that facilities implement specific P2 measures (the latter being reflected in IP 23):

- One approach is to build a condition in the standard that requires facilities to analyze the feasibility of P2 options before meeting the standard through pollution control.
 - Another approach is to set the standard using conventional methods but then complement it with an aggressive P2 outreach/technical assistance campaign to urge industry to achieve the standard via P2 measures.
 - A third approach would be to set the standard to reflect a specific P2 methodology while not actually requiring industry to use that methodology.
 - A fourth approach would be to set a standard at an emissions level that is so stringent that it forces P2.
 - A fifth approach would be to set a standard using conventional approaches such as 75% control and establish an alternate P2-based limit such as reducing the use/unit of product by 50% as an option for compliance. This is generally similar to an approach USEPA took in its proposed pharmaceutical MACT standard.
- *P2 Definition* – Since this IP directly affects underlying factors of core regulatory programs in the form of standards, including a clear definition of P2 in the actual standard will help ensure the role of P2 in this practice’s implementation.
 - *Environmental Cost Accounting* – One additional item that can be added to P2 components in standards is requiring or prompting industry to consider the potentially hidden environmental costs and benefits of meeting a standard through multimedia P2 measures rather than through pollution control.

Implementation Challenges

- *Regulatory/Statutory* – States may face legal obstacles to indirectly integrating P2 into standards. However, such obstacles are likely to be less than those that might arise when directly integrating a specific P2 performance-based requirement into standards. This is because, while indirectly integrating P2 into standards makes the standards P2-preferential, it does not prescribe a specific P2 requirement. In doing so it allows facilities to still meet the standard via pollution control measures.

- *Financial* – The resources for staffing to implement this IP may be greater than those for other practices since staff time will be needed for development of P2-preferential standards and their long-term implementation.
- *Institutional* – Building P2 components into standards increases the likelihood that their implementation will be longer lasting since standards are underlying drivers of core regulatory programs. A challenge to agencies is to develop an approach for integrating P2 into standards that reinforces existing agency directions, for example, implemented according to a schedule that reflects the agency’s pressing environmental priorities. This indirect approach may present problems for enforcement staff by making compliance more difficult to determine. When there are different options for compliance and no direct links between standards and actions required by the facility, enforcement can be more difficult.
- *External* – There is likely to be significant interest in development of P2 components in standards in communities and environmental groups. This is an IP for which early and ample public participation is important. Facilities may resist the measures if they require greater compliance costs.

Experience

Some states have implemented these different approaches to indirectly integrating P2 into standards. In general, however, these efforts are not part of a systematic P2 regulatory integration agenda but rather one-time attempts to reflect P2 in a certain standard.

Establishing Standards that Require Facilities to Institute Specific P2 Approaches

Description

In contrast to the indirect approach to P2 integration in standards (IP 22), this IP involves including specific and direct P2 requirements in standards. Sample approaches include:

1. Setting a P2-performance-based benchmarking level as the standard, such as requirements for wastes per unit of product, percentage reductions in materials use, or levels of chemical efficiency.
2. Defining a specific P2 approach as the actual standard such as defining a P2 technology as a technology-based standard, requiring raw material substitution measures, or establishing product specification requirements.
3. Requiring analysis of certain considerations, such as multimedia impact of achieving the standard or environmental costs of meeting the standard via pollution control versus P2.
 - *P2 Definition* – Due to the direct nature of this IP, the components of the practice itself will embody the definition of P2. For example, integrating what is intended to be a P2 benchmark in a standard would necessitate metrics that measure chemical use or generation at the source rather than at the end-of-pipe. For this reason, it is necessary for the agency to ensure that the practice’s design is consistent with the agency’s definition of P2.
 - *Institutional Change* – Standards are one of the underlying drivers to how core regulatory programs operate. They set the parameters that core programs and facilities adhere to in most regulatory decision-making. As a result, development of components that require specific and direct P2 action is likely to yield lasting and systematic P2 regulatory integration. While the IP itself affects programs’ driving factors, it is important to complement this IP with support efforts such as: involving staff and management from core programs in the development of P2 components in standards; evaluating the effectiveness of the IP; and training staff in the application of the P2 components in standards.
 - *Environmental Cost Accounting* – As in IP 22, the inclusion of P2 components in standards can be enhanced by ECA. An agency may require or encourage facilities to analyze the less obvious benefits of meeting a standard through multimedia P2 measures rather than through pollution control.

Implementation Challenges

- *Regulatory/Statutory* – States may find legal obstacles to the implementation of some approaches to this IP. Approaches to addressing these obstacles include: relying on interpretation of core regulatory program authorities; relying on the general authorities of

the agency; expanding authorities through new rules and statutes, or providing incentives for facilities that agree to meet these requirements.

- *Financial* – Staffing costs associated with this IP may be moderate due to time needed to develop this IP and subsequently implement it.
- *Institutional* – This IP may be perceived by core programs as being close to their conventional practices in that it is regulatory in nature, it relies on standards as an underlying program factor and its design is likely to be dependent on quantifiable metrics. As a result, if legal and financial obstacles can be addressed, staff in core programs may positively regard this IP. The institutional challenge to this IP is systematizing its implementation once the P2 components are initially integrated in rules. Some agencies may feel that this IP may contradict a policy of voluntary P2 within the agency. However, it can be developed in a way where the IP applies to facilities that agree to have it apply and, in turn, receive various substantive and/or administrative incentives.
- *External* – There is likely to be significant external stakeholder interest on both sides in development of this IP. Early and active public participation may also help address legal issues raised during development of this IP.

Experience

States' experience in this area is limited. Some states have integrated direct P2 requirements into the definition of technology-based standards. In general, states have not taken this more direct approach to P2 regulatory integration.

Broadening Regulations to Incorporate Methodologies that Consider Total Costs and Environmental Impacts

Description

All state agencies consider financial impacts as part of their proposal and adoption of new or modified environmental regulations. The purpose of this exercise is for the agency to consciously weigh the financial benefits of the regulation in question with the financial costs to the regulated community. This IP involves having agencies use ECA techniques as part of the process of assessing the financial impacts of new and modified regulations, particularly technology selection and regulatory impact assessment.

An earlier section of this Compendium provides an in-depth discussion on ECA. It explains that ECA is based on four elements: a comprehensive enumeration of the monetary and non-monetary costs and benefits of a project or program; a long time horizon to fully account for the effects of the project or program; a discount rate that allows present and future benefits to be compared; and a methodology for comparing non-monetary costs and benefits to the monetary costs and benefits, whether quantitatively or qualitatively.

ECA is a tool for advancing sound decision-making. When inserted into the process of proposing and adopting new and modified regulations, ECA provides the benefit of taking into account environmental and other social costs and benefits related to the regulation under review. As a result, it will allow the financial analysis of a new or modified regulation to have a broader appreciation for the true extent of costs and benefits of the regulation that a standard regulatory impact analysis would not provide.

- *Institutional Change* - The agency will need to develop expertise in applying ECA and modify the regulatory development process to allow for ECA integration.
- *Multimedia Considerations* - By considering all environmental costs and benefits of a proposed regulation, ECA will, among other things, account for multimedia environmental effects, including the transport of pollutants from one medium to another after they are released to the environment.
- *Evaluation Component* - ECA is itself a method and a tool for evaluating programs and decisions. However, the agency should also periodically update its ECA methodology to take advantage of new knowledge and techniques.
- *Environmental Cost Accounting* - ECA is integral to this practice.

Implementation Challenges

- *Regulatory/Statutory* - No significant challenges.
- *Financial* - No significant challenges.

- *Institutional* - This practice introduces a methodology that may be unfamiliar to many agency decision-makers. Some training may be required. In addition, the agency will need to modify whatever internal standard operating procedures it maintains for regulatory development to reflect the inclusion of ECA as part of the regulatory review. It may also benefit from developing easy-to-follow written staff guidance.
- *External* - Attempting to monetize environmental damages can be controversial with environmental interest groups. In addition, the industrial community may reject the broader view (of social costs) which an agency may choose to include in its regulatory review. The inclusion of external stakeholders in the development of ECA methods helps ensure buy-in to potentially controversial aspects of this method.

Experience

No cases of states practicing ECA in developing regulations were identified.

IP 25

Cul	Rul	\$	FP	Per	Enf	Rep
-----	-----	----	----	-----	-----	-----

Requiring the Development of a P2 Plan, the Implementation of Which is Voluntary

Description

The concept behind P2 facility planning programs is that if a facility considers its opportunities for P2, it will realize the benefits of P2 and voluntarily implement cost-effective P2 measures it identifies. IPs 25-30 all are related to facility planning and represent a hierarchy of increasing P2 Plans into core regulatory programs. This IP starts with simply having a facility prepare a Plan whereas IP 30 would use a P2 Plan as the basis for a multimedia permit. An agency considering P2 Planning as a component of a regulatory integration agenda would be advised to consider the level of integration of the Plan into core regulatory programs that it wants to pursue.

This IP also assumes there are no other facility planning requirements in place and that the agency uses other regulatory tools (e.g., permits, enforcement settlements, etc.) as vehicles to require the development of a P2 plan. The development of P2 Plans can be linked to facilities' other planning requirements such as hazardous waste minimization plans and water toxicity reduction evaluations. These types of links will not only make the P2 Plan more relevant, but allow for greater coordination between agency programs.

There are two basic approaches that an agency can take in developing this IP: the first is to have facilities develop P2 Plans for the facility's own self-evaluation and P2 opportunity identification; the second is to complement the first with the agency's use of P2 Plans to promote more holistic, P2-based efforts within agency core regulatory programs. Examples of the latter include using the P2 Plan as a tool in the implementation of a majority of the other IPs included in this Compendium. As the source of quantitative data, the P2 Plan has the potential to provide the measurable tools to develop many other IPs. The agency could look to a P2 Plan as the point of reference for developing and implementing other IPs.

- *P2 Baseline and Metric* – Having the facility develop a quantitative P2 baseline and metric is particularly meaningful to this IP because they form the basis for measurement in the plan. In doing so, they provide a substantive basis to what could otherwise be a vague plan.
- *Institutional Change* – One approach to systematizing this IP is for the agency to develop a standard set of contents for a P2 plan. This will help avoid situations in which there are wide variations across facilities. Another approach is for the agency to develop a policy or standard operating procedure that details when and how this IP may be applied in negotiated or voluntary situations.
- *Environmental Cost Accounting* – Several states require some type of ECA as part of a P2 plan. This is intended to complement the technical P2 options analysis contained in the plan by identifying the financial benefits of P2 options. An agency implementing this IP may want to consider the inclusion of an ECA component as well.

Implementation Challenges

- *Regulatory/Statutory* – An agency that wants to include a P2 plan requirement in a conventional regulatory vehicle (e.g., permit) may face a legal obstacle as a result of not having the authority to do so. Such a facility may have to rely on the interpretation of authorities governing the core regulatory programs. However, most applications of this IP are either with states that have distinct facility planning laws or states that include a P2 plan requirement as part of an agreement negotiated by the agency and the facility (e.g., a Supplemental Environmental Project (SEP)) or as part of a voluntary regulatory incentive-based program. In these applications, the question of specific legal authority is moot.
- *Financial* – Resources needed to implement this IP vary widely and depend on the level of review and follow-through the agency desires.
- *Institutional* – The institutional challenge related to this IP is developing the practice in a way that it is applied systematically rather than on an individualized, case-by-case basis.
- *External* – There is likely to be intense external stakeholder interest in this IP since it raises many issues around demands on company resources, confidentiality of information, and perceived or real liability. In most states, P2 Plans remain on-site at the facility. A summary report is submitted to the agency and the agency has the ability to review the Plan on-site. Determining how to best provide the agency with access to the Plan, if it is desirable, may pose a significant challenge both in terms of management, resources and confidentiality.

Experience

States have considerable experience with requirements for the development of P2 plans as a result of both facility-planning laws and of the inclusion of facility-planning requirements in other regulatory vehicles. More than 20 states have facility-planning laws and several states have included requirements for the development of a P2 plan in agreements with facilities such as SEPs and regulatory incentive-based programs. The contents of P2 plans vary widely. In most states, the contents of the plans are minimally defined by the agency. Other states have a greater level of content specification, most notably New Jersey and Massachusetts. In most states' planning requirements, there are a few common, basic elements including: identification of P2 options and a feasibility assessment, and goal setting. Several states that have undertaken facility-planning programs as a result of state laws have developed evaluations of the effectiveness of planning.

IP 26

Cul	Rul	\$	FP	Per	Enf	Rep
-----	-----	----	----	-----	-----	-----

Requiring Facilities to Implement a P2 Plan

Description

IP 25 refers to the mandatory development of a P2 plan, the implementation of which is voluntary. This IP takes this concept one step further by requiring that a facility implement all or part of the findings of its P2 plan. The plan may be developed as part of the same process that requires its implementation or, alternatively, as part of a separate condition, such as a statutory P2 facility planning law. In the former case, the agency, using a regulatory vehicle (e.g., permit, enforcement settlement), would require a facility to develop and implement a P2 plan. In the latter situation, the facility would have developed a P2 plan for some other reason (e.g., a P2 facility planning law, the facility's own initiative) and is subsequently required by the agency to implement all or part of it.

- *Institutional Change* – This IP elevates oversight activities and associated staffing expertise to exercise fair and thorough reviews of P2 plans.

Implementation Challenges

- *Statutory/Regulatory* – In the absence of explicit authority to require P2 plan implementation, a state agency likely will face legal obstacles to requiring implementation of a P2 plan. Such obstacles become moot if the P2 plan implementation becomes a condition of a voluntary program or a negotiated agreement between the agency and the facility.
- *Financial* – As with IP 25, the amount of resources needed by the agency to implement this IP depends on the extent of review and follow-up that the agency desires. In all cases, however, implementation represents a non-trivial addition to staffing.
- *Institutional* – The institutional challenge to this IP is developing the practice in a way that there is a standard approach for when and how P2 plans are required to be implemented.

Many state agencies have policies, explicit or implicit, that consider the implementation of P2 plans to be strictly at the discretion of the facility. This IP contradicts such a policy.

- *External* – Significant external stakeholder interest in this IP is inevitable. The industrial community is likely to oppose to this approach because it brings government too close to industrial operations.

Experience

States tend not to require implementation of P2 facility planning laws for several reasons. Most agencies assume either that the financial benefits of P2 are a sufficient incentive to prompt a

facility to implement cost-effective findings or, alternatively, that if a facility faces mandatory implementation of its P2 plan, it may not aggressively seek P2 options as part of its planning. Two states' P2 Facility planning programs (California and Maine) require that facilities meet the goals in their P2 plans. There appears to be no other state experience with mandatory implementation of P2 plans as part of a condition within a regulatory vehicle (e.g., permit, standard). There is clearly more experience with states requiring the *development* of a P2 plan as part of a voluntary program or negotiated agreement between the agency and facility rather than requiring the *implementation* of parts of a P2 plan as conditions in such programs.

Linking P2 Plans to Permitting and Compliance Activities

Description

State P2 facility planning requirements typically result in P2 plans that are stand-alone documents. This IP involves state agencies connecting the contents of P2 facility plans with permits and compliance activities. To develop the IP, the agency could establish criteria for conditions when this IP would be developed. Development of these criteria could be linked to the agency's efforts to develop IP 35 and 45, setting agency priorities for permitting and enforcement schedules based on P2 factors and overlaying various data reported by a facility, respectively. Criteria could be either environmentally related, program-based, or both. For example:

Examples of environmentally related criteria

Facilities with the largest:

- Schedules for inspections of "major facilities"
- Environmental release/wastes indexed to production
- Increase in releases/wastes
- Releases/wastes weighted with risk factors

Examples of program-based criteria

Link to program activities, such as:

- Schedule for inspections of "major facilities"
- Schedule for permitting for facilities that meet an environmental criteria
- Development of Supplemental Environmental Projects

Once the agency has developed its criteria for when to best apply this IP, there are many ways in which state agencies can use P2 facility plans as a tool in permit and compliance activities, including:

1. Having agency permit and compliance staff review the P2 plan to guide their regular activities with the facility.
2. Using the P2 plan to identify potential multimedia impacts of pending permit or compliance decisions.
3. Requiring the implementation of certain P2 options in the plan for purposes of achieving compliance or meeting a standard.
4. Using the P2 plan as a verification tool for permit and compliance data.
 - *P2 Baseline and Metric* – The P2 plan may provide a valuable P2-based multimedia baseline and metric for the agency to consider in permitting and compliance activities.
 - *Institutional* – To make this IP more systematic and standardized, it is best for the agency to develop a standard operating procedure on when and how the P2 plan will be linked to

permit and compliance activities. This could include a minimum set of review criteria that agency staff would follow to help standardize the practice. The standard operating procedure would need to be inserted into relevant policies, core program work plans, etc.

- *Environmental Cost Accounting* – If the P2 plan contains some ECA information, it may prove to be a valuable tool for the agency to use in helping the facility consider the financial benefits of P2 options versus pollution control options as a result of permit and compliance requirements.

Implementation Challenges

- *Regulatory/Statutory* – A state may face legal obstacles if it develops this IP such that it goes beyond a review of the P2 plan as part of a core program. For example, it may require the implementation of components of a P2 plan as part of a permit. Such steps may be perceived by industry as mandating behavior. Nevertheless, this IP can still be implemented in ways that would avoid legal challenges, such as limiting it to activities in which core programs review the P2 plan as part of other considerations in decision-making; or including it as a component of a voluntary program or a negotiated settlement.
- *Financial* – Costs associated with this IP would be limited to staff resources and will vary significantly with the approach and scope of implementation.
- *Institutional* – Developing this IP systematically in the agency is a significant challenge to the agency if it is to move beyond case-by-case applications. Without rigorous implementation, this practice is potentially dependent on the actions of individual agency staff. Standardization of the practice will ensure a predictable, consistent approach, which is essential to achieve business acceptance, if not outright support.
- *External* – As long as the agency's implementation of this practice does not include activities that may be perceived by industry as requiring mandatory implementation of the P2 plan, there may be general industrial support for the agency's efforts to link various environmental documents for a facility. Other external stakeholders are likely to be supportive of this IP as well. A significant challenge facing the agency, however, will be addressing confidentiality issues, particularly if implementation of the IP involves having the P2 Plan submitted to the agency.

Experience

To some extent, state P2 facility planning programs are already evolving into the next wave of P2. This includes finding ways to integrate P2 plans more with activities of core regulatory programs. However, this is rarely pursued on a systematic basis and, instead, is done either on a case-by-case basis or as a staff or management initiative without changes to the program's key drivers. Two current ways in which states are linking P2 plans and permit and compliance activities are (1) by reviewing P2 plans as part of a compliance assistance or permit application process, and (2) by reviewing and discussing the P2 plan as part of a regular or multimedia inspection.

Relating P2 Planning with Accident Release Program Planning

Description

State and federal environmental regulations require industrial facilities to develop plans for preventing and managing environmental emergencies, including catastrophic emergencies. These plans have agency-defined contents and conclude with facility identification of action items that require review and approval of a regulatory agency. This IP involves using the development of such emergency prevention and response plans as a tool to promote P2. In general, the ways in which P2 can be integrated into such planning are through adding P2 components to the contents of plans and through integrating P2 into the agency's review of such plans. The reader is encouraged to review IP# 27 for a discussion on linking accident release program planning to the development of P2 Plans.

- *Institutional Change* –To integrate P2 concepts into the content of emergency response plans, P2 additions must be incorporated into rules, policies or guidance documents that define the overall content of emergency response plans. To include P2 concepts in agency review of emergency response plans, training will educate emergency response staff on approaches, but such training needs to be complemented with a documented standardized approach to such reviews in workplans, staff performance measures, and other key drivers of staff behavior.
- *Multimedia Considerations* – The nature of emergency response plans makes them good candidates for inclusion of multimedia impacts of measures designed to prevent and manage environmental emergencies. The agency may have opportunities to use emergency response plans as a tool to consider non-P2 impacts as well as P2 opportunities.
- *Environmental Cost Accounting* – At minimum, agency review of emergency response plans to integrate P2 can encourage facilities to use ECA measures to point to the benefits of P2 over pollution control in preventing environmental emergencies.

Implementation Challenges

- *Regulatory/Statutory* – It is unlikely to encounter legal obstacles to integrating P2 considerations in review of facilities' emergency response plans. However, there may be legal obstacles to states' integrating specific P2 contents into emergency response plans. To address such obstacles, states may find that authorities pertaining to emergency response planning address the *prevention* as well as the management of emergencies. Such authority may aid in integrating some prevention concepts into the content of emergency response plans.
- *Financial* – Resources would be needed for the initial development of this IP to define P2 content of plans or staff development. Longer-term staff resources are likely to be minimal or absorbed into the overall costs of the program.

- *Institutional* – The institutional challenge of this IP is developing it in a way that makes the integration of P2 in emergency response planning standardized in the agency rather than implemented on an *ad hoc* basis.
- *External* – Integrating P2 concepts into the content of emergency response plans may trigger more than passing interest from external stakeholders, particularly industry, since it may be perceived as an additional compliance burden. Communities may be equally interested owing to the capacity of prevention measures to reduce, as opposed to manage, risks of emergency events.

Experience

While it is likely that Accident Release Program Planning programs are, perhaps even without their knowledge, integrating P2 concepts into their programs, no formal efforts to do so were identified.

Relating P2 Plans to Programs Involving Environmental Management Systems

Description

The emergence of Environmental Management Systems (EMS) as overarching tools for a facility's environmental program raises the question of the relationship between an EMS and a P2 plan developed in response to a regulatory requirement. This issue has become compelling in states that have P2 Planning requirements and where industry is pursuing ISO certification. In general, an EMS, including ISO certification, is, among other things, a company's internal planning document for addressing regulatory compliance as well as non-regulatory environmental priorities. State agencies are in the process of assessing how best to relate a facility's EMS to regulatory requirements, if at all. An EMS does not necessarily focus on, or drive, P2 approaches. This IP involves developing a direct connection between the two in an effort to advance P2 both in general and through core environmental programs that may be affected by the EMS. Therefore, agencies are seriously cautioned to note that without a strong P2 component in the EMS, P2 could be consumed by other components that are more directly related to environmental compliance. A wide variety of approaches are possible for linking EMS and P2 plans, including:

1. Using the data in a P2 plan to provide a baseline and metric for the EMS.
2. Using the P2 plan as the prevention component of the EMS.
3. Using the goals in the P2 plan to set priorities and determine resource commitments in the EMS.
4. Linking P2 and P2 plans to EMS via voluntary environmental initiatives.
 - P2 Definition – The benefit of linking a P2 plan to an EMS is that it provides a clear definition of P2 and distinction between P2 and pollution control that may otherwise be absent. Including a clear definition in the P2 plan will increase its ability to clarify the role of P2 in the EMS.
 - Multimedia Considerations – The multimedia nature of an EMS enhances the potential interactions with a P2 plan.
 - Environmental Cost Accounting – Some EMSs may include ECA considerations. If it does, or if ECA can be added to it, the EMS and P2 plan link may identify more effectively the financial benefits of achieving EMS objectives through P2 measures.

Implementation Challenges

- *Regulatory/Statutory* – No significant challenges.

- *Financial* – Resources for this IP would be limited to staff resources, particularly in its initial development.
- *Institutional* – Developing and practicing a standardized approach to linking P2 plans and EMS is the institutional challenge facing this IP.
- *External* – Since EMSs are dominantly industry-driven, there is likely to be substantial external stakeholder interest in this IP. If the IP is developed in the context of voluntary initiatives or negotiated settlements, there may be significant opportunities for external stakeholders and the agency to work cooperatively to best determine how to link P2 plans to EMSs.

Experience

The integration of EMS into environmental agency practices is more prevalent in voluntary initiatives and negotiated agreements between agencies and industry than in individual, medium-specific core regulatory programs. Voluntary initiatives and negotiated agreements give agencies greater latitude to work cooperatively with industry to best determine the role that P2 and a P2 plan can play in relation to the EMS. This latitude can be used by the agency to creatively work with the facility to incorporate P2 components and/or a P2 plan into the EMS. Most state voluntary efforts that require or promote development of EMSs do have P2 components, but do not specifically relate the EMS to a P2 plan. Several states, such as Oregon and Alaska, are exploring connections between using EMSs as the basis for permitting. Washington and Massachusetts are considering how to best link EMSs to P2 Plans.

Developing Multimedia Permits that include a P2 Basis

Description

The concept of multimedia permits has general appeal both for its potential to promote P2 as well as its potential to streamline environmental regulatory requirements. Conceptually, the benefits of multimedia permits could be significant in terms of streamlining both permitting and enforcement, tracking cross-media shifts and identifying facility-wide risks in a way that single-medium permits cannot. Until recently, the implications of multimedia permits were limited to their conceptual benefit since no practical experimentation had occurred. In the past several years, more study yet still very limited experimentation with multimedia permits has been pursued by state agencies and the federal government.

With no statutory parameters or institutional history, there is no common definition or understanding of what constitutes a multimedia permit. In particular, the fundamental element that would drive the design of multimedia permits is the modification of substantive elements of single media permit requirements. At one extreme, a multimedia permit could be a simple coordination of administrative permit requirements, such as public hearings. At the other extreme, it could actually change the substantive environmental limits contained in the individual permits, which is likely to require regulatory and possibly statutory changes.

In any case a multimedia permit is not necessarily P2-based. In the conceptual design in which administrative permit coordination constitutes a multimedia permit, P2 may be an *unplanned* result. But as the conceptual design of multimedia permits moves towards changing the substantive environmental requirements of single-medium permits, P2 becomes even greater. Baselines and metrics may be P2-based. Data developed as a result of P2 planning can affect development of multimedia permit limits. Cross-media transfers can be managed. And a facility's comprehensive review of its operations can lead to self-identification of P2 options.

- *P2 Definition* - A clear definition of P2 is the agency's first step towards developing a multimedia permit effort that is P2-based rather than end-of-pipe. By understanding what P2 is and how it is different from pollution control, the agency can then make the conscious choice to either design the substantive elements (e.g., permit limits, data requirements) of the permit to reflect P2 or limit itself to administrative streamlining in which P2 may happen to occur but not by design.
- *P2 Baseline and Metric* - If the agency's intent is to develop a multimedia permit design that drives P2, developing P2 baselines and metrics can be the focal point for its design. Building P2 baselines and metrics into the multimedia permit will allow for multimedia, P2-based measurements over the life of the permit. In addition, a P2 baseline can provide the agency with greater comfort in its ability to build P2-based benchmarks and incentives into the multimedia permits (see the description of IP 6 for lists of the IPs in this compendium which lend themselves best to P2 regulatory incentives and benchmarks). The metrics used to measure P2 in a multimedia permit need to reflect the agency's definition of P2. For example, P2 is measured in New Jersey's multimedia

permits through “nonproduct output” (NPO), the quantity of hazardous substances generated by a production process and not intended for use as a product, prior to its storage, recycling, treatment, control, or disposal.

- *Agency Resources* - The agency will need to commit sufficient resources to make this practice a reality. Since the practice is relatively untested, these resources likely will be substantial.
- *Institutional Change* - If the agency undertakes a multimedia permit effort on a wholesale basis, a major overhaul of an agency’s organization and operations probably will be necessary. If the agency undertakes a multimedia permit effort through pilot or voluntary programs, it may have the option of establishing a separate program to administer the multimedia permits or to rely on cross-program management. Regardless of the management approach it takes, significant changes are needed to the factors that drive agency behavior (e.g., regulations, standard operating procedures.)
- *Multimedia Considerations* - Multimedia considerations are the foundation of this practice.
- *Evaluation Component* - Long-term analyses need to be conducted to evaluate the extent to which the multimedia permits lower costs for the agency and facility and improve environmental performance. Due to the complex nature of this IP, the agency may benefit from outside assistance in an evaluation of its multimedia permit effort.
- *Environmental Cost Accounting* - With new multimedia permit limits, facilities will have more financial incentive for finding P2 opportunities. Technical Assistance with ECA can help identify cost-effective opportunities.

Implementation Challenges

- *Regulatory/Statutory* - The question of whether legal obstacles exist to multimedia permits depends on the extent to which the agency’s multimedia permit design changes the substantive environmental elements of the permit. For multimedia permit designs that have a greater focus on coordinating administrative requirements, it is unlikely that legal obstacles exist. For multimedia permit designs that move more towards changing the substantive elements of air, water and waste permits, it is likely that the agency could use existing authorities for the purpose of issuing the multimedia permits. However, regulatory change (and perhaps statutory) may be necessary in order to put in place certain requirements of the multimedia permit. If the agency is undertaking the multimedia permit effort as part of a voluntary program with industry, the agency may find greater latitude in working within current statutes.
- *Financial* - The agency will face a challenge in finding new resources to implement the multimedia permit effort or, more likely, redirect existing resources to this effort.
- *Institutional* - Institutional challenges will be formidable. This IP requires fundamental change, including the need to alter drivers of the day-to-day operations of core regulatory programs (e.g., regulations, standard operating procedures, staff assignments, workplans).
- *External* - If developed cooperatively with facilities, multimedia permits are likely to be welcomed owing to their capacity to simplify and reduce burdens on the applicant. Facilities can also use the process as an opportunity to conduct longer-term business planning. The environmental community may approach the concept of multimedia permits cautiously, particularly if the agency is taking the approach of changing the

substantive elements of permits rather than simply coordinating administrative requirements. In addition, USEPA will have significant interest in an agency's efforts to develop multimedia permits as it affects many areas overseen at the federal level (e.g., permits, enforcement, reporting, resource allocation.) It is wise for the agency to invite external stakeholders into its early design deliberations.

Experience

Experience with actually issuing multimedia permits appears to be limited to New Jersey's ongoing Facility-wide Permit pilot program. The USEPA Amoco permit project involved in-depth analysis but did not result in an actual P2-based, multimedia permit. Other states have studied, but not acted upon, the concept of multimedia permits.

IP 31

Cul	Rul	\$	FP	Per	Enf	Rep
-----	-----	----	----	-----	-----	-----

Providing P2 Information to Facilities through the Permit Application Process and Compliance Inspections

Description

Agency staff and facility representatives regularly interact as part of the day-to-day implementation of environmental programs. These interactions offer valuable opportunities for the transfer of both technical and non-technical information about P2 to facilities. This IP involves systematizing the agency's efforts to develop and distribute P2 information to industrial facilities through its core regulatory programs.

Although facilities may receive P2 information through many channels, information received through the agency's core regulatory programs may be given special attention. P2 communication associated with permitting, compliance, and enforcement efforts indicates the agency's commitment to P2 as the preferred method for achieving compliance. Information may be targeted at particular facilities based on their compliance record, TRI reports, chemical use quantities, or other parameters. Information may also be differentiated by industry group and/or facility size in order to address particular audiences more effectively.

The types of information that agencies can provide to facilities could fall into at least three categories: general P2 planning techniques and approaches, technical P2 information that is specific to the facility's operations; and regulatory information for the individual facility that may identify P2 opportunities (as discussed in IP 45).

Some of the interactions between state agency staff and industrial facility representatives that may lend themselves best to the provision of P2 information include:

1. Permit application and review
2. Compliance inspections
3. Notice of changes in regulatory requirements
4. Agency workshops and seminars for the regulated community
 - *P2 Definition* - P2 information should emphasize the state's P2 definition.
 - *P2 Baseline and Metric* - P2 information providers should emphasize the importance of tracking chemical use and measuring P2 progress.
 - *Agency Resources* - Relatively minor resources are needed for the development of P2 communication materials.
 - *Institutional Change* - This is a difficult area to affect because, to a large degree, this IP relies on the routine and sometimes informal interactions between agency staff and facility operators to be a vehicle of P2 information. The agency's goal is to implant this IP in all factors that affect the interaction between agency staff and facility operators.

This is the formal (e.g., workplan, guidance document) and informal aspects of agency-facility interaction.

- *Multimedia Considerations* - P2 information should emphasize multimedia considerations.
- *Evaluation Component* - Periodic surveying of facility operators will help reveal how effective this information vehicle is in encouraging P2.
- *Environmental Cost Accounting* - P2 information should emphasize the importance of tracking material and waste management costs, and of making investment decisions using an ECA approach.

Implementation Challenges

- *Regulatory/Statutory* - The agency may face legal difficulties in providing technical-type of information to industrial facilities. The agency would need to make clear that the facility is still responsible for compliance and that the agency cannot be held liable for the information it provides to a facility.
- *Financial* - The state must develop appropriate and effective P2 communication materials.
- *Institutional* - It may be best for the agency to take a step back and consider those factors that drive staff's day-to-day interactions with facility operators to consider how to provide P2 information as part standard operating procedure. Relying solely on training will be limited if other factors (e.g., job descriptions) do not also require or promote the implementation of this practice. The agency should also consider that some enforcement staff may not be used to or inclined to providing guidance and recommendations in a cooperative fashion with industry. Granted, training of all staff would be necessary. But it may also be necessary for the agency to "hand pick" staff whose approach best lends itself to this cooperative type of interaction with industry.
- *External* - Facilities need to be receptive to suggestions concerning their operations. Mixing regulatory/enforcement functions with informal technical assistance can create awkward, or at worst distrustful situations. Including industry stakeholders in the design of how this practice is implemented will help avoid these pitfalls

Experience

Many states are providing information to their core regulatory program staff to distribute and discuss with facility operators during their regular interactions. Systematizing this practice to move beyond *ad hoc* provision of P2 information seems to be the challenge even for agencies that have efforts underway.

IP 32

Cul	Rul	\$	FP	Per	Enf	Rep
-----	-----	----	----	-----	-----	-----

Including Administrative Incentives in a Permit or Rule in Exchange for the Facility Undertaking a Specific P2 Effort and/or Achieving Quantifiable Progress, including Incentives such as:

- Fewer Inspections;
- Longer Permit Life;
- Less Sampling;
- Extending the Length of a Permit to Provide the Facility with Greater Flexibility

Description

The idea behind this practice is a trade-off. The agency increases administrative flexibility in permitting in exchange for a facility's serious commitment to preventing pollution.

This practice may take many forms. It can be designed so that incentives apply to one facility sector or many. It can be prescriptive, detailing many specific trade-offs, or open-ended, allowing permit writers leeway in developing facility-specific trade-offs. An example of a specific trade-off would be reduced sampling in exchange for the use of a certain type of equipment. A more general approach might include, for example, accepting any P2 plan in return for lighter treatment as long as actual releases do not increase.

In general, these types of administrative incentives fit within the confines of existing environmental statutes. They do not change the substantive requirements, standards or limits of a rule or permit. Rather, they rely on the administrative discretion that the agency possesses to impose substantive requirements. Some of these types of administrative changes, however, are specified in regulations and, as such, may require regulatory changes.

- *P2 Definition* - The importance of a clear definition of P2 is underscored in situations in which the agency is offering incentives for P2 commitments.
- *P2 Baseline and Metric* - Facilities in the program can be required to track the performance of their P2 projects in return for regulatory flexibility. If tracking P2 progress is one of the benchmarks that a facility must adhere to in order to gain the incentive, the importance of quantifiable P2 metrics is heightened.
- *Agency Resources* - This program is not necessarily an expensive one, but it will need inventive staff to devise changes that benefit all stakeholders. It could even save money in the long run if participating facilities eventually require less oversight.
- *Institutional Change* - The institutional challenge in offering administrative incentives for P2 commitments is for the agency to do it in a way that is equitable and standardized so that it does not become, or appear to be, "special treatment" for certain facilities. This

means developing the practice in a way that clearly links the incentives to certain non-negotiable conditions. Detailing the specific incentives to be offered as well as the conditions in rules, workplans, and guidance documents will help to systematize this practice.

- *Multimedia Considerations* - This is an opportunity to integrate multimedia considerations into permit writing, although it is not an absolute prerequisite for this practice.
- *Evaluation Component* - This is a practice that would benefit from mid-course evaluation so that the agency can determine whether the incentives are leading to real P2.
- *Environmental Cost Accounting* - This practice should result in achieving the same or superior environmental results at less cost to the agency and to business. ECA can help illuminate whether this objective is, in fact, achieved.

Implementation Challenges

- *Regulatory/Statutory* - Many changes can take place within the scope of current statutory authority. However, some changes, such as minimum sampling requirements and the duration of permits, may require regulatory revisions.
- *Financial* - No significant challenges.
- *Institutional* - No significant challenges.
- *External* - Businesses are likely to embrace a program that mitigates the burden associated with permits. NGOs, however, may be wary of a program if it relaxes too many requirements without requiring substantive progress in P2. Having a clear, strict definition of P2 may assuage NGOs that fear incentives may take the teeth out of regulatory programs.

Experience

Some states are experimenting with offering administrative incentives for P2 commitments. These range in terms of breadth of coverage. One example is North Carolina's program that limits reporting requirements for VOC emissions in exchange for adopting coatings that emit low levels of VOCs.

IP 33

Cul	Rul	\$	FP	P	Enf	Rep
-----	-----	----	----	---	-----	-----

Agency Fast-Tracking Review of Permit Modifications for P2 Changes

Description

Typically, there is a waiting period for requests for permit changes even for relatively minor changes such as adding a small additional source. This practice is designed to reward facilities that undertake voluntary P2 steps by reducing the time it takes for the agency to review its permit modifications.

Similar to the practice of trading P2 for special administrative treatment, there are many variants on this practice. Essentially, the permitting entities decide to give preference for review based on certain criteria, either P2 performance to date or expected P2 from the proposed plan. Relatively few regulatory complications exist as this practice relies on the administrative discretion already available to the agency. This practice is inapplicable if all permits are reviewed quickly within a program or if the program has a rigid, short legal timeframe in which it needs to review all permit applications.

- *P2 Definition* - The definition of P2 should be clearly incorporated into the criteria the agency uses to decide which facilities to fast-track.
- *P2 Baseline and Metric* - The agency may decide to base the criteria for fast-tracking on P2 progress from a certain baseline. However, in the case in which the permit modification itself is for a change that would introduce a P2 practice, a new baseline must be established.
- *Agency Resources* - This practice can be implemented at modest cost to the agency.
- *Institutional Change* - Implementing this practice in a way that avoids the impression of “special treatment” means detailing clearly the circumstances under which a permit may be fast-tracked in all relevant documentation of how the permit process operates (e.g., rules, workplans, standard operating procedures, etc.).
- *Multimedia Considerations* - The permit may or may not involve multimedia considerations. Fast-tracked projects should take account of multimedia considerations, i.e., they should not involve cross-media transfers.
- *Evaluation Component* - As with other IPs, some measure, perhaps in the form of a survey, of how effectively this practice has acted as an incentive to reduce pollution, would be in order. In addition to this qualitative measure, it would be useful to quantify, if possible, the total pounds of pollution prevented by projects initiated under this program.
- *Environmental Cost Accounting* - The facility may save money because of reduced delays in launching new product lines. This advantage in cycle time may be a major

motivator, especially for firms producing consumer products. Discussion of cycle time ought to be part of agency's effort to market this IP.

Implementation Challenges

- *Regulatory/Statutory* - No significant challenges.
- *Financial* - No significant challenges.
- *Institutional* - Setting permitting priorities in agencies can be very contentious. Setting any priority other than "first come, first serve" sends the message that one agenda is considered more important than another. Permit program staff may resent that their queue of permit applications is constantly changing as new P2-related permit applications arrive. Systematizing this practice will necessitate clearly detailing the circumstances under which permits will be fast-tracked so that the practice is clearly understood and equitably implemented in the eyes of staff, the public and the regulated community.
- *External* - While other permit applicants may in concept agree that P2 is a priority, the reality that they may have to stand in line longer as a result of it will not sit well.

Experience

Illinois established a voluntary technical assistance program for industry in which facilities worked with the agency in exploring P2 initiatives. In return, the agency provided expedited permits and variance support. A formal program is not established. The P2 Office helps expedite permits that are needed to implement P2-related projects.

IP 34

Cul	Rul	\$	FP	Per	Enf	Rep
-----	-----	----	----	-----	-----	-----

Permit and/or Compliance Staff make Referrals (Both Mandatory and Voluntary) to P2 Technical Assistance Programs or P2 Compliance Assistance Programs, Including Referrals Based on Agency Analysis of Data Publicly Reported by Facilities

Description

In this IP the agency actively refers facilities to technical assistance programs through its core regulatory programs. Facilities are referred based on the agency's estimation of need. Referrals may be mandatory in the context of permitting and enforcement. It should be noted that this IP assumes that the technical assistance program to which facilities are referred effectively produces P2 results.

Facilities may not be aware of their P2 technical assistance options, and some facilities with compliance problems may be wary of approaching government technical assistance centers. Agency referrals through the permitting, compliance, and enforcement processes can help overcome these barriers, as well as target the facilities most in need of assistance.

Although referrals may be made mandatory, even a voluntary referral from compliance or enforcement staff carries weight. For facilities out of compliance, such referrals send the message that the agency is monitoring the facility, and may be close to taking legal action if the facility does not improve quickly. They also send the message that the agency's preferred method for achieving compliance is through P2.

The agency may identify facilities to be referred on a case-by-case basis subject to the discretion of individual permit, compliance, and enforcement staff. Or it may devise guidelines for automatically referring facilities based on compliance record, chemical use quantities, TRI reports, or other information.

- *P2 Definition* - Technical assistance providers should adopt, and emphasize a consistent definition of, P2 that is identical to the agency's.
- *P2 Baseline and Metric* - Technical assistance providers should emphasize the importance of tracking chemical use and measuring P2 progress. They should also track the P2 progress of facilities receiving their assistance.
- *Agency Resources* - If the state does not already have a technical assistance program, it will need to develop one which could be a significant undertaking.
- *Institutional Change* - Making technical assistance referrals systematic in core regulatory programs will involve changing the drivers that dictate day-to-day operations of permitting and compliance staff (e.g., workplans, standard operating procedures, job assignments)
- *Multimedia Considerations* - Referrals should be based on multimedia criteria. For example, a facility that does not qualify for a referral based on emissions to one medium

might qualify based on the sum of emissions to several media. Multimedia considerations should also be emphasized during the provision of assistance.

- *Evaluation Component* - The agency will want to determine how many facilities actually seek out the technical assistance provider after they have been referred there by the agency. In addition, the agency will have an interest in understanding the type of technical assistance that was provided to facilities it referred to the technical assistance provider. The agency should consider, at a minimum, regular surveying of facilities and summary report from the technical assistance provider.
- *Environmental Cost Accounting* - Technical assistance providers should emphasize the importance of tracking material flows and waste management costs, and of making investment decisions based on Total Cost Assessment. The agency may want to provide the technical assistance program with some guidance on using ECA methods.

Implementation Challenges

- *Regulatory/Statutory* - No significant challenges.
- *Financial* - The state must have an active and effective P2 technical assistance program in place.
- *Institutional* - See financial.
- *External* - Facilities will need to be receptive to suggestions concerning their operations. Including industry stakeholders as this practice is implemented will help gain buy-in. The agency should stress the benefits of P2 to facilities and the non-regulatory nature of the technical assistance provider.

Experience

Many states have referral relationships set up between their technical assistance providers and their regulatory agencies. In some cases, most notably in Massachusetts, this relationship has been integrated into agency protocols and practices. In other states, however, this relationship is still somewhat unstructured.

Setting Agency Priorities for Permitting and Enforcement Schedules Based on P2 Considerations

Description

While state agencies conduct regularly scheduled inspections at facilities, they may also modify an inspection schedule for a facility or class of facilities based on a variety of factors. Similarly, agencies may tailor their schedules for renewals of classes of permits. This IP is intended to use P2 considerations to affect an agency's permitting and inspection schedules. It is expected that any schedule setting based on P2 would be complemented by implementation of other IPs. The P2 considerations that may drive an agency's inspection and/or permitting schedule could include:

1. Environmental conditions that the agency believes can be addressed via P2;
2. Demonstration of extensive P2 potential by facilities within a certain sector;
3. Identification of a regulatory obstacle to P2 affecting an industrial sector;
4. Imposition of a new, P2-based regulation;
5. Desire to make different medium-specific permitting or inspection schedules coincide to promote multimedia considerations.
 - *Institutional Change* – To achieve a lasting impact, it will be necessary for the agency to change its approach to adopting permitting and inspection schedules. It involves developing a standard operating practice for when and how P2 will affect permitting and inspection schedules and integrating it into agency rules, policies or guidance affecting scheduling. Also, existing policies and priorities that dictate current schedules for permitting and inspections may contradict new P2-based scheduling procedures and will need to be modified.

Implementation Challenges

- *Regulatory/Statutory* – An agency may face federal legal deadlines related to permitting or inspections that may supercede efforts to drive schedules based on P2. State-imposed legal deadlines for permitting and inspections may require regulatory change to implement a new P2-driven schedule.
- *Financial* – No significant challenges.
- *Institutional* – Standardizing this practice will be a challenge to an agency. Allowing for the regular assessment of when schedules can and should be affected by P2 will present sticky issues in reshaping business-as-usual practices which give no special standing to P2.

- *External* – It is likely that there will be considerable interest by industry and environmental groups in this IP if the P2-affected schedule is one governed by a federal workplan. USEPA will have considerable interest as well. Documenting a clear rationale for how P2 will influence scheduling will help address concerns of external groups.

Experience

State agency experience with this IP is related to individual facilities rather than classes of facilities or industrial sectors.

IP 36

Cul	Rul	\$	FP	Per	Enf	Rep
-----	-----	----	----	-----	-----	-----

Including Specific P2 Conditions in a Permit or Compliance Settlement

Description

There are many types of P2 requirements that agencies could attempt to include as mandatory provisions in permits or compliance settlements. These requirements demand a specific performance measure or action on the part of the facility as opposed to conditions that prompt industry to realize the benefits of P2 and, in doing so, voluntarily implement P2 measures. While the list of possible mandatory P2 requirements can be extensive, it would include items such as:

1. Implementation of a specific P2 technique
2. Development of a P2 plan with defined content
3. Achieving P2 goals contained in a previously developed P2 plan
4. Use of a different raw material or chemical feedstock
5. Achieving a specified level of efficiency (as defined by use of raw materials per unit of product or generation of emissions/discharges/wastes per unit of product)
6. Publicly reporting defined P2 metrics
7. Conducting and reporting, or simply conducting, a materials accounting assessment
8. Meeting defined product specification standards
9. Achieving an agency-imposed level of reduction

This IP is similar to IP 23 in which standards would be set that require specific P2 approaches. The difference is that IP 23 could apply to a class of facilities or it could also be the legal foundation for inclusion of P2 in permits and compliance activities as outlined in this IP.

- *P2 Definition* – The nature of the conditions that would be developed under this IP define P2. Therefore, it is necessary for the agency to stress its definition of P2 in the *development* of any conditions implemented as part of this IP.
- *P2 Baseline and Metric* – This IP takes a much more agency-directive approach than most others. In contrast to incentive-based IPs, this directive-type approach necessitates a quantifiable P2 baseline and metric. Like any conventional regulatory condition, these are needed to ensure that the facility has met the requirement.
- *Institutional Change* – Since this IP is so specified, it may have a more appeal to core program staff. However, standard operating procedures are still needed to document when and how this IP is applied. These procedures can be used to stress the difference

between P2 and pollution control and need to be reflected in the rules, policies, guidance and workplans that currently govern conventional pollution control conditions in permits and settlements.

- *Environmental Cost Accounting* – An agency can consider integrating an ECA condition that may, for example, require the implementation of a P2 measure over a pollution control measure if the P2 measure would result in a certain financial return, or “hurdle rate.”

Implementation Challenges

Regulatory/Statutory – There are likely to be significant legal obstacles to this IP.

- *Financial* – Resources primarily are staff related and may be relatively high compared to other IPs. Depending on how the agency manages its effort, additional staff may be needed to oversee P2 requirements as enforceable conditions.
- *Institutional* – Including specific P2 conditions in permits and compliance settlements may lend itself somewhat more easily to institutionalization since it resembles conventional regulatory conditions more than other IPs. Nevertheless, standard practices need to be developed so that the P2 conditions are developed and implemented in a systematic and consistent fashion.

Some state agencies may consider this IP contradictory to existing policies that limit P2 efforts to voluntary initiatives.

- *External* – It is likely that there will be significant interest from external stakeholders, particularly if the agency defines its action as a new initiative. Industry may challenge the authority by which the agency requires compliance with specific P2 measures.

Experience

In general, state regulatory integration efforts have either developed P2 conditions that rely on industry realizing the benefits of P2 or they have achieved more defined P2 conditions as part of voluntary initiatives or negotiated settlements (such as SEPs). There are exceptions, particularly where a standard, such as a technology-based standard, has specific P2 components. In general, however, this IP tends to run counter to the regulatory integration approach taken in most states.

IP 37

Cul	Rul	\$	FP	Per	Enf	Rep
-----	-----	----	----	-----	-----	-----

Providing Financial Incentives to Promote P2, such as Grant or Loan Programs and Tax Incentives

Description

This IP involves providing financial assistance to industry in the form of programs that provide industry with no-or low-interest capital to implement P2 measures developed under other IPs or in the form of tax incentives that are designed to promote adoption of P2 techniques over pollution control technologies.

- *P2 Definition* – Since this IP involves providing funding for implementation of P2 measures, ensuring that the funds are, in fact, directed towards true P2 projects is important. A clear definition of P2 in all standard procedures governing the implementation of this P2 is necessary.
- *Environmental Cost Accounting* – A facility applying for financial assistance under this IP will need documentation of its funding need. Developing the standard for such documentation to include ECA procedures will provide the basis for an accurate assessment of true financial need and benefit the facility by introducing it to the concept of ECA for future financial evaluation purposes.

Implementation Challenges

- *Regulatory/Statutory* – It is likely an agency needs specific authority to implement an industrial financial assistance program and would clearly need new authority to develop a tax incentives program.
- *Financial* – In addition to staff resources needed to implement a loan or grant program, considerable capital funds, at least in the short run are needed. Funds may need to be applied to outreach as well. Once underway, an initial capitalization may evolve into a revolving loan fund. As for a tax incentive program, an assessment of the impact on revenues would clearly be needed.
- *Institutional* – A formal financial assistance program or tax incentive program would need to be developed in conjunction with standardized operating procedures in core regulatory programs. The agency should also ensure the consistent and systematic use of the financial assistance program, particularly as a complement to other IPs. These efforts could involve integrating links to the financial assistance program into program workplans, staff job descriptions, training agendas, etc.
- *External* – Smaller businesses may be the external stakeholder most interested in this IP. The agency may need to develop an outreach campaign particularly dedicated to small business.

Experience

Some states offer P2 financial assistance (usually as part of a larger environmental financial assistance program). These programs appear to not be linked to any P2 regulatory requirements. Regarding tax incentives, Delaware, Oklahoma, Oregon, and Rhode Island have some form of tax incentive that was developed specifically to promote P2.

Establishing P2 Conditions in General Permits or Permits-by-Rule

Description

General permits and permits-by-rule provide agencies an opportunity to affect the integration of P2 into permits for an industrial sector or class of permits. Use of these permits varies from state to state but, in general, provides regulatory oversight for smaller facilities with no or little use of toxics. Many different types of conditions could be integrated into these permits depending on the agency's intent and philosophy.

- *Institutional Change* – To systematize the integration of P2 into permits-by-rule and general permits, the agency may need to develop standard operating procedures for P2 integration that are consulted whenever general permits and permits-by-rule are developed and/or modified. Such procedures would need to be integrated in the policies that govern the development of these rules.

Implementation Challenges

- *Regulatory/Statutory* – General permits and permits-by-rule typically are authorized by separate agency regulations. These tend to be general in nature and may provide the agency with sufficient regulatory discretion to integrate P2 conditions.
- *Financial* – Funding needed to implement this IP will be limited and related mostly to staff development of the initial general permit and permit-by-rule conditions.
- *Institutional* – Since general permits and permits-by-rule do not receive as extensive an agency review as individual permits, their development and modification present a ready opportunity for P2 integration. The institutional challenge is systematizing agency practices for integrating P2 into general permits and permits-by-rule rather than relying on *ad hoc* decisions.
- *External* – There is likely to be moderate external stakeholder interest in this IP, primarily from facilities covered by general permits and permits-by-rule.

Experience

Some states are attempting to include P2 in permits by rule. Texas is actively developing permits by rule with P2 intentions and Massachusetts has implemented a certification program for small sources that is similar to a general permit which has P2 considerations.

Establishing a Broader Emissions Cap to Encourage Operational Flexibility as a Means of Promoting P2 Changes

Description

The premise behind this IP is that P2 will result from regulatory strategies which provide facilities, particularly those with demonstrated environmental leadership, with optimal flexibility to manage their operations through limited regulatory oversight. This is because the regulatory flexibility gives facilities the latitude to make changes to their operations that result in P2 because it is in the facilities' self-interest to do so. This practice involves setting a regulatory limit to cover several pieces of equipment or operations. In doing so, it gives the facility flexibility to make changes among several pieces of equipment or operations under the broader cap.

This IP is most directly relevant to air permitting and the development of Title V permits under the Clean Air Act Amendments is the vehicle for such innovation. USEPA has included significant discussion on the related issues of grouping sources and defining emissions units in its "white papers" on Title V implementation. While the relevance of this IP to air permitting is direct there is potential for agencies to develop this IP in a way that provides a link between air and water permitting. Water rules regulate internal waste streams at industrial facilities which could be the basis for an agency to explore ways to develop caps that link water and air permitting in order to promote P2. One specific way to integrate a P2 basis into these efforts could be to link a broader air/water emissions cap to data developed in the facility's P2 Plan. For example, an agency could work with a facility to coordinate production process definitions in their P2 Plan are the same as process definitions in air and water permits.

- *P2 Definition* – If the agency is developing this IP for the explicit purpose of promoting P2, an unambiguous definition of P2 is essential.
- *P2 Baseline and Metric* – Aggregating limits to broader caps may present the P2 disadvantage of masking measures of chemicals and wastes at the more specific source level. However, this does not necessarily mean that P2 metrics cannot be developed to complement broader emissions caps. The agency may consider a scheme in which emissions caps are at a broader (e.g., facility) level but P2-based monitoring information (e.g., pounds of waste per product) are measured at the point of generation. Setting a baseline using actual emissions/wastes from the facility normalized for production may effectively help to ensure that the regulatory flexibility provided results in P2. For example, developing pound of emissions/wastes per unit of product metrics based on actual emissions/wastes will allow the agency and the facility track the extent to which the regulatory flexibility offered results in true P2.
- *Institutional Change* – An agency needs to develop standard operating procedures as part of the programs employing this IP that specify when and how it will be applied.

- *Evaluation Component* – Since this IP is such a substantial change to core programs (particularly the air program) and is still evolving, an agency that employs its use may need to consider a formal evaluation of its impact specific to P2.

Implementation Challenges

- *Regulatory/Statutory* – Efforts to include broader emissions caps have relied on the PAL authority in the Title V Clean Air Act Amendments and through mutual agreements as part of voluntary programs.
- *Financial* – Considerable staff time is needed to conduct the review necessary to develop the initial permit containing the broader emissions caps. The additional resources needed for this staff time may be offset by fewer staff resources needed for frequent amendments to permits when facilities make changes under more restrictive, conventional limits.
- *Institutional* – This IP is a substantial change in setting limits, particularly for the air program. It appears that no state has yet ventured into making it a standard practice. However, standardization is still needed for when and how, and for what types of facilities, this IP will be applied.

A state agency may need to consider if this IP is consistent with existing policies regarding incentives to facilities that demonstrate environmental leadership.

- *External* – Considerable support within the industrial community and considerable caution on the part of environmental groups is likely for this practice. It is also likely that USEPA will be interested in working with states, or monitoring states' efforts, to develop this IP.

Experience

This IP has been employed in air permitting where conventional limits are set on specific pieces of equipment. The more flexible caps have been set at production process levels and even at the facility level for groups of pollutants. All efforts at setting broader emissions caps are on experimental or pilot bases, most notably through the P2 in Permitting Pilot (P4) Program, the Plantwide Applicability Limits (PAL) of Title V of the Clean Air Act Amendments, and the New Jersey Facility-wide Permit Pilot Program. Most efforts have provided the broader caps as an incentive to “good actor” facilities.

IP 40

Cul	Rul	\$	FP	Per	Enf	Rep
-----	-----	----	----	-----	-----	-----

Establishing Operational Flexibility by Building in Anticipated Changes in Production, Operating Scenarios and Upcoming Standards in an Initial Permit

Description

Like IP 39, this practice is based on the premise that P2 will result from regulatory strategies that provide facilities, particularly facilities with demonstrated environmental leadership, with flexibility to manage their operations through limited regulatory oversight. This is because the regulatory flexibility will give facilities the latitude to make changes to their operations that result in P2 and chemical use reductions because it is in the facilities' best interest. This IP involves the agency and facility anticipating a variety of possible scenarios that may be relevant to the facility over the life of a permit and integrating those scenarios into an initial permit to enable future facility actions with limited regulatory oversight. Development of this IP may be particularly challenging for industrial facilities since industrial environmental staff are not typically involved in business planning in the company. Their role is typically to ensure environmental compliance after production decisions are made.

- *P2 Definition* – If the agency is developing this IP for the explicit purpose of promoting P2, then a clear definition is essential.
- *P2 Baseline and Metric* – As mentioned in IP 39, setting a baseline using actual emissions/wastes from the facility normalized for production may effectively help to ensure that the regulatory flexibility provided results in P2.
- *Institutional Change* – An agency needs to develop standard operating procedures as part of the programs employing this IP that specify when and how it will be applied.
- *Multimedia Considerations* – An agency may consider expanding the possible operating scenarios, chemicals or regulatory requirements to take into account the impact of these changes on other environmental media or on other regulatory requirements. Since the use of this IP to date has been in voluntary programs, the addition of multimedia impact analysis may necessitate agreement between both the agency and the facility.
- *Evaluation Component* – Since this IP is such a substantial change to core programs (particularly the air program) and is still evolving, an agency that uses it may need to consider a formal evaluation of its impact specific on P2.
- *Environmental Cost Accounting* – An agency may use ECA techniques to both assess the financial benefits of future facility improvement, to quantify the benefits of operational flexibility to candidate companies, and to market all programs in the industrial community.

Implementation Challenges

- *Statutory/Regulatory* – Legal obstacles are unlikely to the development of this IP. To a large extent, it adheres to regulatory requirements. It simply incorporates all possible regulatory requirements that may affect a facility in a permit so that the facility does not have to undergo additional regulatory scrutiny in the event it changes an operation and triggers a regulatory requirement not anticipated in an initial permit. As is the case with IP 39, the EPA “White Papers” on implementation of Title V of the Clean Air Act Amendments includes considerable discussion on operating scenarios which is an important component of implementing this IP in the air program.
- *Financial* - Considerable staff time is needed to develop the initial permit that anticipates various regulatory requirements. The additional resources needed for this work may be offset by the decrease in staff resources required for frequent amendments to permits when facilities make changes to conventional permits.
- *Institutional* – This IP is a substantial change in permit development. It appears that no state has yet ventured into making it a standard practice. However, standardization is still needed for when and how, and for what types of facilities, this IP will be applied.

An agency may also need to consider whether any specific programs (e.g., air program) have existing policies in place that are relevant to this IP. In addition, an agency may have policies in place regarding regulatory incentives for facilities that have demonstrated environmental leadership. Both types of policies need to be considered for consistency with this IP.

- *External* – There is likely to be considerable support within the industrial community for this IP and considerable caution on the part of environmental groups. It will be important for the agency to address the confidential business information issues that are likely to be raised when a facility is asked to consider environmental issues in light of production planning. It is also likely that USEPA will be interested in working with states, or monitoring states’ efforts, in implementing this IP.

Experience

Like IP 39, this practice has been tried in pilot programs such as the P2 in Permitting (P4) Program and the New Jersey Facility-wide Permit Pilot Program. These experiences involve anticipating possible operating scenarios, chemical use, production changes and upcoming environmental standards. These are still experimental and often are provided as an incentive to “good actor” facilities.

IP 41

Cul	Rul	\$	FP	Per	Enf	Rep
-----	-----	----	----	-----	-----	-----

Defining in the Up-front Permit Categories of Changes (P2 and otherwise) that Do Not Require Agency Pre-Approval.

Description

This IP is similar to IP 40. The difference between the two is that in Practice 40, an initial permit anticipates a variety of possible changes at the facility and includes regulatory permit conditions that reflect those changes. In this IP, the initial permit defines types of changes at the facility that would not require approval of the agency prior to being implemented by the facility. The reduced cost of the permit modification approval process provides an incentive for facilities to invest in these projects. Over time, facilities also will have the incentive to plan P2 projects so that they can be written into future permit renewals.

- *P2 Definition* – If the agency is developing this IP for the explicit purpose of promoting P2, regulated entities must have a clear definition of P2 at the outset.
- *P2 Baseline and Metric* – The agency may find that the most effective way to differentiate what are considered to be P2 changes available to a facility without agency pre-approval is through the use of a quantifiable P2-based baseline and metric. Rather than developing an exhaustive list of P2 techniques or technologies for which agency pre-approval is not needed, the agency might consider defining changes that do not require agency pre-approval based on a P2-based metric which would be documented by the facility and made available for agency review.
- *Institutional Change* – However, an agency may need to develop standard operating procedures as part of the programs employing this IP that specify when and how it will be applied.
- *Evaluation Component* – Since this IP is such a substantial change to core programs (particularly the air program) and is still evolving, an agency that employs it may consider a formal evaluation of its impact on actual P2 progress.
- *Environmental Cost Accounting* - Reducing the burden of permit modification proceedings provides an additional cost incentive for facilities to engage in P2. Such burden reduction is best monetized within an ECA framework.

Implementation Challenges

- *Statutory/Regulatory* – There may be legal obstacles to this IP, particularly in the air program, where statutes and more often rules contain strict definitions of changes for which facilities must receive agency pre-approval. An agency may be able to address some of these obstacles through regulatory modifications.
- *Financial* - Considerable staff time is needed to develop the initial permit that anticipates various regulatory requirements. The additional resources needed for this staff time may be offset by the decrease in staff resources required for frequent amendments to permits

when facilities make changes to conventional permits because certain operating scenarios or regulatory requirements were not initially anticipated.

- *Institutional* – This IP is a substantial change in permit development. Standardization is needed for when and how, and for what types of facilities, this IP will be applicable.

A state agency may also need to consider whether any specific programs (e.g., air program) have existing policies that are relevant to this IP. In addition, a state agency may have policies in place regarding regulatory incentives for facilities that have demonstrated environmental leadership. Both types of policies need to be considered for consistency with this IP.

- *External* – There is likely to be considerable support within the industrial community and considerable caution on the part of environmental groups for this practice. It is also likely that USEPA will be interested in working with states, or monitoring states' efforts, to develop this IP.

Experience

Like IPs 39 and 40, this practice has been tried in pilot programs such as the P2 in Permitting (P4) Program, the New Jersey Facility-wide Permit Pilot Program, and other experimental permit programs. These experiences have been experimental in nature and often are provided as an incentive to “good actor” facilities.

Defining Categories of Changes (P2 and Otherwise) in the Original Permit that Require Lesser Agency Administrative Review

Description

An agency would write explicitly into a permit what types of changes face a lower hurdle for agency approval. It would then expedite review of these changes, and reduce the paperwork burden on the facility. If the agency intends to limit the changes to those that are P2, it may define by a P2 metric the changes for which lesser administrative approval is required, e.g., changes that increase the chemical efficiency of a production process.

Reducing the burden of the permit modification approval process reduces the cost of P2 projects. If the agency and the facility, working together to write a permit, can predict what types of changes are certain to be beneficial, the facility can then make those changes according to its own schedule and with faster and limited agency approval. The reduced cost of the permit modification approval process provides an incentive for facilities to invest in these projects. Over the long run, facilities will also have the incentive to plan P2 projects so that they can be written into future permit renewals.

- *P2 Definition* - Proposed projects should conform to the P2 definition adopted by the state.
- *P2 Baseline and Metric* - Defined baselines and metrics are needed to determine whether certain changes will meet the agency's requirements for changes that qualify for this incentive.
- *Agency Resources* - The agency will need to deploy permit staff to review permit modifications in an expedited manner.
- *Institutional Change* - The agency will need to develop rules and procedures for defining the types of changes for which lesser administrative review will be provided as well as for expediting the review of the changes at the facility.
- *Multimedia Considerations* - The agency may choose to stipulate that the changes for which lesser administrative review will be provided must consider or avoid cross-media transfers.
- *Evaluation Component* - Over time, the agency will want to evaluate this effort to determine if P2 resulted from such permit flexibility.
- *Environmental Cost Accounting* - Reducing the burden of permit modification reviews provides an additional cost incentive for facilities to engage in P2. Monetizing such savings is best captured in an ECA framework.

Implementation Challenges

- *Regulatory/Statutory* - It is unlikely that statutes are so restrictive as to obstruct the agency's ability to implement this practice.
- *Financial* - If successful, in the long run the agency may save money by substituting reduced permit review proceedings for full proceedings.
- *Institutional* - Rules and standard operating procedures are needed to implement this practice in a systematic fashion.
- *External* - It is likely that the industrial community will support development of this practice. The environmental community, however, may have concerns that a reduced level of regulatory scrutiny may lead to less environmental protection. Limiting the practice to P2, along with clear and quantifiable P2 metrics, will help mitigate this concern.

Experience

Experimental permit programs, such as New Jersey's Facility-wide Permit Program and P4 permits, are testing approaches to this practice.

IP 43

Cul	Rul	\$	FP	Per	Enf	Rep
-----	-----	----	----	-----	-----	-----

Unifying Various Reporting Requirements from a Facility So that They are Derived from the Same Source and Use a P2 Baseline Measure

Description

Facilities currently report to a variety of agencies and offices on their releases to environmental media and compliance with regulations. There is general acceptance that new efforts are needed to improve the data that industry reports to environmental agency. It would seem that there are two basic approaches to how such improvements could be undertaken:

- The requirements for what a facility reports to the agency is changed to reflect improvements
- The agency manipulates data submitted by facilities under existing reporting requirements

While most reporting reform efforts currently underway at the federal and state level are more reflective of the latter approach through assignment of single identification numbers, connected databases, etc., this IP is intended to reflect efforts more associated with the former basic approach. Under this approach, facilities' reporting requirements would be changed to reflect P2 as well as to integrate reporting to eliminate reporting redundancies, highlight cross-media shifts, provide aggregate summaries of emissions and to make data more user-friendly to the public. Integration in its truest sense would involve (1) having a common set of data from which all the information on the reports would be derived; (2) having that common set of data be one that is able to measure P2; and (3) combining all data elements into a single reporting scheme that eliminates redundancies and extraneous information.

This practice will take time to implement. Some initial steps are creating an inventory of existing "data elements," or the individual bits of information, and noting whether they are required by regulation or by statute. Some brainstorming sessions with stakeholders will ensure that the concerns of all sides will be taken into account. Finally, a model should be developed and pilot tested with facilities prior to recommending changes to regulations or statutes.

This practice holds promise for improving the quality and comprehensibility of the reported information. The agency should be mindful of these goals in revising the forms. Agencies may want to consider implementing it jointly with IP 44, which calls for public reporting of P2 progress.

A concept that is linked to integrated reporting is materials accounting (MA). MA, essentially a materials "balance sheet," is a means of tracking what goes into, through and out of a facility. It has the effect of improving data quality because without a way of checking whether inputs equal outputs, mistakes can easily go unnoticed. Several states have started to require facilities to report MA data, also known as chemical use information (to distinguish it from chemical release information). Whether or not it is reported publicly or confidentially to the agency, it is still a

useful mechanism to implement jointly with integrated reporting. This is because MA provides the underpinning upon which an integrated system rests.

- *P2 Definition* - The agency will need to adopt a single, consistent definition of P2 before implementing this practice.
- *P2 Baseline and Metric* - Another IP that dovetails with integrated reporting is measuring progress in P2 over time. While reporting the quantities used and released of different chemicals, it would be logical to track quantities used compared to some base year and the percentage reduction or increase since that time. These statistics call attention to a facility's trends in P2.
- *Agency Resources* - The agency will have to commit substantial resources to this practice.
- *Institutional Change* - It is difficult to predict the institutional impact of implementing this IP following its development and pilot phases. Should a state reach a point of full-scale implementation, it is likely that it will challenge much of its conventional operations and single-medium organizational structure.
- *Multimedia Considerations* - One of the main purposes of this practice is to aggregate environmental information across media. Facility managers who have participated in a pilot project in New Jersey indicate that one of the aspects they value most about this approach is that it provides a "panoramic view" of what their facility uses and releases.
- *Evaluation Component and Environmental Cost Accounting* - One way of evaluating the success of this practice is to consider the environmental costs avoided through P2 improvements. Not all the P2 improvements will be attributable to the changes in reporting, but it is a useful framework for tracking P2 practices as a whole.

Implementation Challenges

- *Regulatory/Statutory* - In order to change reporting schemes, it is likely that regulations and possibly statutes will need to change as well. These may be controversial. Current reporting requirements are typically intended for a single medium in order to be consistent with how offices in regulatory agencies are set up. Nevertheless, going through the exercise of developing and testing schemes for integrated, P2-based reporting, it will be impossible to identify specific regulatory and statutory elements that need change.
- *Financial* - This practice will require substantial resources to embark on designing a unified report, testing and re-testing it, and developing staff resources and expertise essential to implementation.
- *Institutional* - In the long run, overhaul of the reporting system may entail major changes to agency operations, including departmental restructuring to facilitate the multimedia focus of the new approach and an overhaul of reporting requirements and their infrastructure.
- *External* - It will be important to obtain buy-in from the reporting industries. A series of focus groups early in the process followed by pilot tests with a small group of facilities will help keep these stakeholders in the loop. EPA will also have to be kept informed as they would need to sanction any deviation from existing federal reporting requirements. Finally, NGOs and community representatives should be consulted. They will want to

ensure that in the process of information consolidation no information is left out. They, too, will be important stakeholders in the process.

Experience

A recent pilot test in New Jersey generated one proposed method for integrating six major environmental reports. Other initiatives, such as the Common Sense Initiative, Project XL, the Sector Facility Reporting Index, and several state programs, are also exploring various approaches to consolidating reporting requirements.

Requiring Facilities to Publicly Report Data to Track P2 Progress

Description

In this IP, the agency promulgates reporting requirements designed to enable facility-level P2 progress measurement. Such reporting can either be developed as a completely new and stand-alone set of requirements or as a complement to some existing reporting effort. At minimum, data reported should include hazardous chemical use, releases, transfers, quantity recycled, and a measure of production volume. These requirements should not be redundant with existing reporting requirements. A way to complement public reporting of P2 data with existing aggregate waste and release data would be to index use and total waste/emissions to production but to also have release goals reported as aggregate. Approaches such as this would allow the public and the agency to appreciate P2 progress even in situations when aggregate releases/wastes increase due to increases in production.

In order for state government and citizens to measure industrial progress in preventing pollution, the agency must collect data on hazardous chemical use, pollution, and hazardous waste, as well as some measure of production activity. Chemical use data is both necessary to measure source reduction and important to the right-to-know community. The facility itself can also benefit if it uses the P2 progress information to drive continuous environmental improvement.

A reporting system will be most successful if it is integrated with normal regulatory activity. For instance, if the state levies a volume-based fee on hazardous waste generation net of on-site recycling, the reporting system should be designed to facilitate the collection of these fees. If air permits limit the fugitive emissions of VOCs according to a particular calculation method, the reporting system should use this calculation method. Combined with IP 11 (the imposition of fees on pollution) or IP 16 (pollution permit trading), a reporting system can serve the dual purpose of supporting the regulatory infrastructure and supporting P2 progress measurement by the state and the public. IP 43 (unifying environmental reporting requirements) is also closely related.

A measure of production volume is necessary to normalize the data to changes in economic activity. A decrease in production may trigger a decrease in waste generation unrelated to P2.

If the agency undertakes this IP, data should be readily available and accessible to the public. Citizens should be able to query the database online over the Internet for both individual facilities and broader groups, and the data elements should be clearly explained. The state may also want to conduct its own analysis of statewide P2 progress, and issue an annual report to the public.

- *P2 Definition* - Required data elements should be focused on measuring P2 according to the state's definition of P2. The true measure of source reduction, for example, is a reduction in hazardous chemical use or non-product output per unit of product.
- *P2 Baseline and Metric* - The reporting system's inaugural year becomes the baseline from which P2 progress is measured and to which changes in production are normalized. The metric used to define "P2 progress" depends on the P2 definition adopted by the state. However, a well-designed reporting system and database will permit users,

including both the state and interested citizens, to analyze the raw data as well as the summary statistics.

- *Agency Resources* - Resources need to be made available to administer and manage the reporting requirements.
- *Institutional Change* - If the agency is creating a completely new reporting effort, then an administrative component needs to be created to manage the program. If the agency is adding reporting requirements onto an existing reporting effort, there will be less legal obstacles but significant management leadership would be necessary.
- *Multimedia Considerations* - Consistent with the definition of P2, a reporting system designed to facilitate measuring P2 progress must take into account various media and the potential for cross-media transfers. The agency could also use a survey to determine the impact of the reporting requirement on facilities.
- *Evaluation Component* - In addition to simply tracking and providing information, the agency may also use the reporting system to evaluate the effectiveness of other agency programs aimed at fostering P2. Though evidence of P2 progress would not prove that agency programs had been effective, a lack of P2 progress would indicate that agency programs had not produced the desired result.
- *Environmental Cost Accounting* - A P2 progress reporting system will help individual facilities identify their waste streams and opportunities for prevention. Tracking and quantifying material flows is a first step toward implementing a comprehensive ECA system since costs occur at each stage of the chemical lifecycle.

Implementation Challenges

- *Regulatory/Statutory* - New reporting requirements at a minimum require new regulatory authority. They may require new statutory authority. However, if the agency is administering this IP as part of a voluntary, incentive-based program, it may consider offering regulatory incentives to facilities that agree to voluntarily report according to the agency's P2 reporting benchmark.
- *Financial* - The agency should invest in information processing equipment and software sufficient to handle data collection, storage, QA/QC, and public access demands. New staff and computer training may be required to support the program.
- *Institutional* - Creating a new program or significantly modifying an existing one is always an institutional challenge within the agency. Since the explicit purpose of this effort is to track multimedia P2 progress, the agency would be well-served by considering how to best develop the program in a way that the reported information will gain the greatest amount of use by both agency programs as well as the public.
- *External* - The regulated community often objects to new reporting requirements as burdensome and a danger to confidential business information. Some industries may present organized opposition. However, the right-to-know community will be strongly in favor of this action.

Experience

Different states have various reporting requirements, some of which are intended to track P2 progress. State reporting schemes that are specifically earmarked for P2 tend to be as a result of a

state P2 law. Several states (New Jersey, Massachusetts, Maine) collect some amount of chemical use data. Many state P2 reporting efforts complement the Toxics Release Inventory or hazardous waste biennial reporting.

Overlaying Publicly Reported Industrial Data to Identify Areas to Focus P2-based Permit and Compliance Activities

Description

State agencies receive a wide variety of environmental data from industrial facilities. Much of these data are medium-specific and directly program-related. This IP involves combining those various data to identify individual facilities, geographic areas, or industrial sectors on which the agency would focus its P2 regulatory integration activities through permitting and compliance. An agency may consider various methodologies for how to combine these data, but the goal is the same: to find relationships between the data that may point to areas where there appears to be substantial, untapped P2 potential.

- *P2 Definition* – Since this IP involves combining data that, in general, are single-medium and end-of-pipe in nature, it is easy to lose sight of the P2 intent of this practice. Emphasizing the definition of P2 is needed to distinguish between multimedia applications of the related data and true P2 applications.
- *P2 baseline and metric* – Even if various medium-specific data are combined, it may not result in a true P2 baseline or metric. The agency may need to consider approaches to complementing the existing data with other data to create true P2 measurements. If it does not want to develop additional reporting requirements, it could consider requiring or requesting complementary P2 measurements as part of voluntary programs and negotiated settlements.
- *Institutional Change* – This IP is one that could be done by the agency on an ad-hoc basis rather than systematically. To guard against this, the agency may need to consider the underlying factors of core programs (e.g., workplans, staff assignments) that will ensure that this IP continues after the first exercise of data consolidation and analysis.

Implementation Challenges

- *Regulatory/Statutory* – No significant challenges.
- *Financial* – If applied in such a way that this IP guides other P2 regulatory integration, it is unlikely that this practice would require significant funds.
- *Institutional* – The institutional challenge to this IP is developing it in a way such that it is applied systematically and routinely, rather than episodically.
- *External* – This IP is not likely to attract as much external interest as other IPs because it will be seen more as an internal agency procedure.

Experience

Some state agencies have had experience drawing connections between various data in the agency and using those data as tools for P2 and multimedia outreach efforts. These efforts are developed to: better inform agency staff about a facility to encourage P2 dialogue; identify industrial sectors to receive P2 attention via regulatory integration measures and P2 outreach; and provide a general tracking of industrial P2 efforts. Data that have been applied in these efforts include Toxics Release Inventory (TRI) data, hazardous waste generator reports, and air emissions statements.

Conducting Multimedia Inspections

Description

Single-medium compliance inspections are intended to verify that a facility is meeting its regulatory requirements. Multimedia inspections add an additional objective of identifying P2 opportunities. P2 can be achieved in two ways: by having single-medium inspectors confer with each other during an inspection and, in doing so, realize multimedia transfers that could be resolved via P2 measures; or by having a single, multimedia inspector identify P2 opportunities as a result of an integrated view of the entire facility.

- *P2 Definition* – Due to the end-of-pipe nature of most environmental regulations, this IP may be implemented with an emphasis on assessing multimedia impacts rather than reducing multimedia impacts via P2. Emphasizing the definition of P2 and its role in all efforts related to this IP is essential.
- *Institutional Change* – This appears to be an IP that agencies undertake only sporadically. Most agencies have not developed standard operating practices for when and how multimedia inspections will be undertaken. Developing such practices and integrating them into factors that underlie the inspection program (e.g., workplans, staff assignments, rules) is necessary to ensure that this IP is institutionalized for the long-term.

Implementation Challenges

- *Regulatory/Statutory* – No significant challenges.
- *Financial* – Additional resources may be needed for staffing purposes, particularly if the agency is expected to maintain the same number of annual inspections when multimedia and P2 considerations are integrated. Further, staff capabilities to conduct multimedia inspections typically are limited and may need upgrade.
- *Institutional* – The institutional challenge to this IP is making it standard practice, rather than dependent on particular inspectors, and making it a lasting practice rather than one implemented on an ad-hoc basis. As part of this effort, the agency may need to revise existing policies about how inspections are conducted and about the nature of the relationship of the inspector and the facility operator.
- *External* – It is likely that there will be less external interest in this IP as compared to others. USEPA may have an interest in implementation of this IP, including the inspection requirements in an agency's workplan.

Experience

Different states have experience with both approaches to multimedia inspections. This is an IP that has been instituted in various forms by many states for several years. However, the extent to

which the practice is reflected in day-to-day practices of core regulatory programs is less extensive.

Negotiating P2 Agreements into Supplemental Environmental Agreements (SEPs)

Description

Supplemental Environmental Agreements (SEPs) are integrated into compliance settlements in order to achieve a greater level of environmental benefit for an offset penalty. This IP involves developing components of SEPs to lead to P2 that may otherwise not have been achieved through a conventional compliance settlement.

- *P2 Baseline and Metric* – Including a P2 component in a negotiated agreement such as a SEP provides the agency with a valuable opportunity to specify that true P2 baselines and metrics be utilized.
- *Environmental Cost Accounting* – As part of assessing whether the P2 component of a SEP will result in financial gain for the facility, the agency may require that the facility undertake an ECA or project(s) proposed in a settlement. This will provide an accurate understanding of the long-term financial impact of P2 measures and a clearer sense of whether the measures are a win-win situation for the agency and facility.

Implementation Challenges

- *Regulatory/Statutory* – Since a SEP is a negotiated agreement between the agency and facility, there are no legal obstacles to its implementation.
- *Financial* – There are no significant financial obstacles to this IP. Most state policies speak to financial gain that a facility may receive as a result of implementing P2 efforts included in a SEP.
- *Institutional* – Most state agencies have opted to experiment with SEPs. Agencies may feel that broader application of the practice may dilute its effectiveness as an incentive, or special reward, in negotiated settlements.
- *External* – There is likely to be limited external interest in this IP, as its implementation is not intended to be a standard operating procedure in the agency.

Experience

This IP has been employed considerably at both the state and federal level. Many states have developed SEPs policies with P2 components, some of which are based on the SEPs policy at USEPA. This practice has been tested more than most other IPs and has documented evidence of its impact.

Providing Penalty Amnesty to a Facility that Agrees to Achieve Compliance Via P2 Measures

Description

The agency agrees to waive penalties for facilities that self-report violations and propose P2 solutions, such as discontinuing use of the hazardous substance that caused the violation. This practice is slightly different from the development of Supplemental Environmental Projects (SEPs, IP 47) because the P2 measures involved in this practice are explicitly employed to achieve compliance whereas P2 measures employed in SEPs are not necessarily linked to compliance.

A program to waive, or partially waive, penalties for facilities that agree to achieve compliance through P2 measures can provide an important incentive for P2. The environmental advantage is that, by changing the inherent design or operation of the production process, P2 is more likely than pollution control to permanently eliminate the potential for future violations. For example, a facility that has been storing a hazardous waste improperly on site may decide to alter its production process, eliminating the generation of that waste to prevent future storage violations.

- *P2 Definition* - Proposed projects should conform to the P2 definition adopted by the state. Having a clear and measurable P2 definition is essential to the ability of the parties to agree up front to the P2 measures for which penalties will be reduced.
- *P2 Baseline and Metric* - The agency and facility will need to agree up front to a P2 baseline and metric that will allow both to ensure that the measure for which penalties were reduced did, in fact, lead to P2.
- *Agency Resources* - The agency will need to deploy enforcement staff with P2 expertise to evaluate waiver requests.
- *Institutional Change* - As with other practices in which P2 incentives are provided via compliance measures, a standard operating procedure will need to be developed to systematize the practice and avoid the perception of “special treatment” for certain facilities.
- *Multimedia Considerations* - Proposed projects should avoid cross-media transfers. The agency could choose to limit the practice to those projects for which the facility can demonstrate that cross-media pollutant transfers will not occur.
- *Evaluation Component* - The agency should monitor the program to make certain that facilities are not withholding violation reports in order to develop P2 solutions that may qualify for a penalty waiver.
- *Environmental Cost Accounting* - Waiving or partially waiving penalties provides an additional cost incentive for facilities to engage in P2. ECA assistance from the agency during the compliance agreement process can help facilities learn about how P2 affects the bottom line. Thus, they will be more inclined to seek P2 solutions in the future.

Implementation Challenges

- *Regulatory/Statutory* - Existing statutes or regulations may not allow penalty waivers.
- *Financial* - The agency may need to reduce its expected revenues from penalties.
- *Institutional* - The agency will need to develop procedures governing conditions under which penalties may be waived. These procedures will need to be clearly detailed in regulations, standard operating procedures, compliance manuals, and other aspects of agency operations.
- *External* - A blanket commitment to waive penalties if facilities self-report violations and propose P2 solutions could lead to some facilities postponing self-reporting until they can develop P2 solutions. In addition, environmental groups may oppose any attempt to reduce penalties.

Experience

No systematic implementation of this IP was identified.

Providing Penalty Relief in Cases Where A Facility Attempted to Achieve Compliance Via a P2 Measure that Failed

Description

In this IP, the agency agrees to waive, or partially waive, penalties for facilities that attempted to achieve compliance through P2 instead of pollution control. These “soft landings” are intended to provide an incentive to facilities to be innovative and pursue P2 approaches to achieve compliance. However, it is a controversial measure since it could be perceived as a reward for feeble efforts at P2.

One barrier to P2 is that the precise quantitative benefits of a P2 project may not be known until the project is implemented. This means that a facility deciding between P2 and pollution control to meet a compliance standard may opt for pollution control in order to be certain of meeting the standard—even if the P2 option is less costly and better for the environment, i.e., because it reduces chemical use and avoids the cross-media transfers inherent in most pollution control options. If the agency reduces penalties that the facility faces if the P2 project fails to meet the standard, the facility will have greater incentive to select the P2 option.

- *P2 Definition* - Qualifying P2 projects should conform to the P2 definition adopted by the state.
- *P2 Baseline and Metric* - If the facility cannot meet the standard through P2, it will need not only a penalty reduction, but also a regulatory variance to allow it to continue operating without meeting the standard for a defined period of time. Further, it may need fast-tracking approvals to meet the standard through back-up pollution control methods. It is likely that the agency would base the magnitude of the penalty relief on the quantity by which the facility fails to meet the standard.
- *Agency Resources* - The agency will need to deploy enforcement staff with P2 expertise to evaluate penalty relief requests.
- *Institutional Change* - It is important for the agency to outline this practice in the appropriate standard operating procedures, rules, and workplans, to ensure that it is considered a standard practice and not “special treatment.” Clear conditions need to be established to define the circumstances under which penalty relief will be provided.
- *Multimedia Considerations* - Qualifying projects should avoid cross-media transfers.
- *Environmental Cost Accounting* - Waiving, or partially waiving, penalties provides an additional cost incentive for facilities to engage in P2. ECA helps both regulators and facility to monetize this incentive.

Implementation Challenges

- *Regulatory/Statutory* - Existing statutes or regulations may not allow penalty waivers.
- *Financial* - The agency may need to reduce its expected revenues from penalties.

- *Institutional* - The agency will need to develop rules governing conditions for qualifying for penalty waiver. Complementary changes to standard operating procedures, workplans, and other practices, will need to be developed.
- *External* - No significant challenges.

Experience

The concept of “soft landings” has been considered by many states, but it appears that there is no systematic implementation of the concept at the state level.

IP 50

Cul	Rul	\$	FP	Per	Enf	Rep
-----	-----	----	----	-----	-----	-----

Extending Compliance Schedule to Allow a Facility to Achieve Compliance Via a P2 Measure

Description

The agency allows facilities that are planning to achieve compliance by implementing complex P2 projects additional time to meet standards.

One barrier to P2 is that P2 projects are often closely connected to the production process. For example, a chemical plant may be able to reduce the generation of hazardous waste by upgrading to more modern process equipment, but in order to do so it may also need to adjust the equipment, piping, and electrical systems upstream and downstream of the new equipment. Safely implementing the project may require many months of engineering work, a training program for employees, and complex construction issues. In contrast, end-of-pipe pollution control solutions often do not impinge on the process and can be purchased as self-contained, “bolt-on” systems. Extending the compliance schedule helps enable facilities to achieve compliance through complex P2 upgrades.

- *P2 Definition* - Qualifying projects should conform to the P2 definition adopted by the state. It is more than likely that the agency will want to pre-approve these P2 projects as part of the agreement it reaches with a facility. Agency staff need to be well versed in the definition of P2 to ensure that it only approves projects that conform to the definition.
- *P2 Baseline and Metric* - The agency will want to establish a clear and measurable P2 baseline prior to the facility’s implementation of its P2 effort so that it can subsequently determine whether compliance was, in fact, achieved via P2. The compliance plan and schedule that the agency agrees to with the facility may be an appropriate place for the P2 baseline and metric to be set.
- *Agency Resources* - The agency will need to deploy enforcement staff with P2 expertise to evaluate extension requests.
- *Institutional Change* - As with other IPs that provide incentives via compliance practices, this practice will need to be standardized so as to avoid concerns of “special treatment” for certain facilities and to clearly link it to P2 projects.
- *Multimedia Considerations* - Qualifying projects should avoid cross-media transfers. The agency could choose to provide this incentive only to P2 projects that do not result in cross-media transfers and/or to facilities that conduct a multimedia analysis of the P2 project.
- *Evaluation Component* - The agency needs to monitor the program to ensure that facilities are not misusing the extensions to put off installing P2 equipment.
- *Environmental Cost Accounting* - Extending compliance schedules provides an additional cost incentive for facilities to engage in P2. For facilities that choose not to pursue this incentive but for whom the agency would like to urge particular P2 projects, the agency could consider including a requirement in their compliance plan to conduct

ECA on pollution control options the facility intends to implement instead of P2 measures.

Implementation Challenges

- *Regulatory/Statutory* - Existing statutes or regulations may not allow compliance schedule extension.
- *Financial* - Adding another item to the list of issues that can be discussed during compliance settlement is likely to extend such discussions, thus demanding more staff time.
- *Institutional* - Procedures to be followed pursuant to this definition need to be detailed in rules, standard operating procedures, compliance manuals, and related documents. This is an IP for which staff training will complement new operating procedures.
- *External* - No significant challenges.

Experience

No systematic implementation of this practice was identified.