

MI DEQ & RETAP Pollution Prevention (P2) Training

What is P2?

How can P2 benefit you?

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The Evolution of Environmental Management (EM)



'90 Pollution Prevention (P2) Act Defines Source Reduction as:

Any practice which reduces the amount of any hazardous substance, pollutant, or contaminant entering any waste stream or otherwise released into the environment (including fugitive emissions)

**prior to recycling, treatment, or disposal;
and reduces the hazards to public health & the environment associated with the release of such substances, pollutants, or contaminants.**

P2 = Source Reduction

- P2 means “Source Reduction” & other practices that reduce or eliminate the creation of pollutants through:**
 - Increased efficiency in the use of raw materials, energy, water or other resources; or**
 - Protection of natural resources by conservation.**

Hierarchy for Waste Management

Source Reduction/E2

Reuse/Recycling

Energy Recovery

Treatment

Disposal



P2 Means

- Process modifications;**
- Feedstock substitutions;**
- Product reformulation;**
- Management practices or housekeeping alterations;**
- Recycling within industrial processes; or**
- Equipment replacement or modifications.**

P2 Programs are Selling Multi-Media Approaches

Water

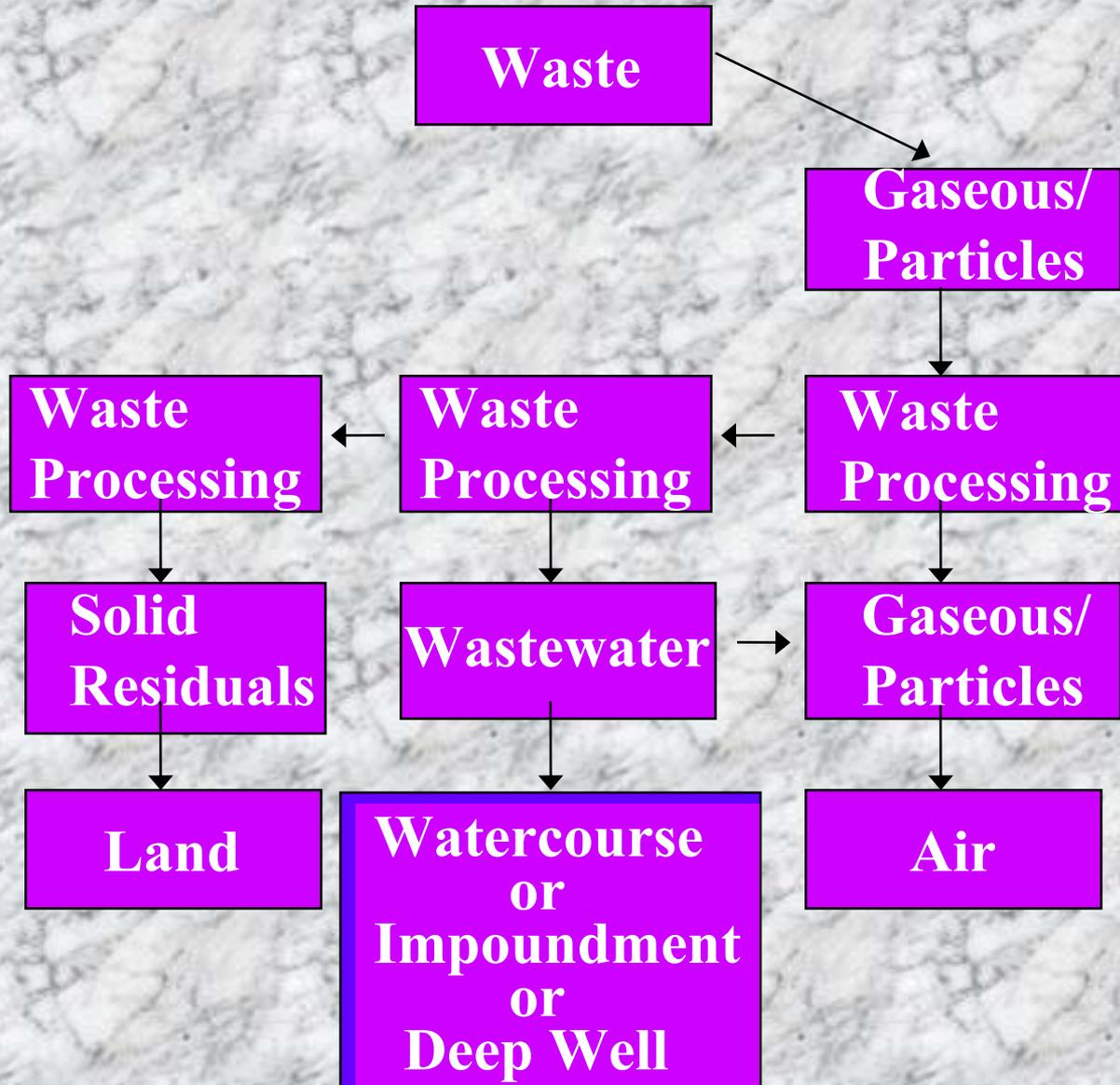
Air

Solids

Time

Energy Efficiency (E2)

Cross-Media Transfer



Cross-Media Transfer (cont.)

- ➔ **An example of cross-media transfer:**
- ❑ **Facility installs a wet scrubber: VOCs transferred from air to water, which is discharged into a nearby stream.**
- ❑ **Discharge to stream requires water permit modification: air stripper is installed to meet permit requirements--VOCs transferred back to the air.**
- ❑ **New air stripper requires another air permit.**
- ❑ **After 3 permits, 3 years, & \$3,000,000 the same amount of contaminants are reaching the air!**

Where Are We?

Evolution of P2 Nationally:

**Technical
Assistance**

(80's)

**P2 Policies and
Programs**

(late 80's & 90's)

**Integrated
into Every
Activity**

(soon!)

The Four Elements of CP

- ❑ **The Precautionary Approach: Prove there is no safer way of proceeding**
- ❑ **The Preventive Approach: More effective to prevent environmental damage**
- ❑ **Democratic Control: Full involvement of all those affected by industrial activities**
- ❑ **Integrated & Holistic Approach: For environmental resource use & consumption; do not shift risks between media, workers or consumers**

Clean Production (CP) Means

Clean production ultimately means:

- ❑ The use of renewable energy & materials,**
- ❑ The minimal use of resources,**
- ❑ The design of sustainable products,**
- ❑ The production of sustainable food, &**
- ❑ The generation of waste that is benign & returnable back into the process.**

Eco-efficiency Means

- ❑ The efficiency with which ecological resources are used to meet human needs**
- ❑ Expressed as the ratio of an “output” to the “input”**
 - ❑ “Output” = The value of the products & services produced by an organization**
 - ❑ “Input” = The sum of environmental pressures generated by the organization**
- ❑ Measurement depends on identifying indicators of both “input” & “output”**
- ❑ Focus: Maximizing the sustainable use of renewable resources**

Eco-efficiency's 7 Demands

- Reducing material intensity of goods & services**
- Reducing energy intensity of goods & services**
- Reducing toxic emissions**
- Enhancing material recyclability**
- Maximizing sustainable use of renewable resources**
- Extending product durability**
- Increasing the service intensity of goods & services**

Sustainability



P2 “Traditional Approach”

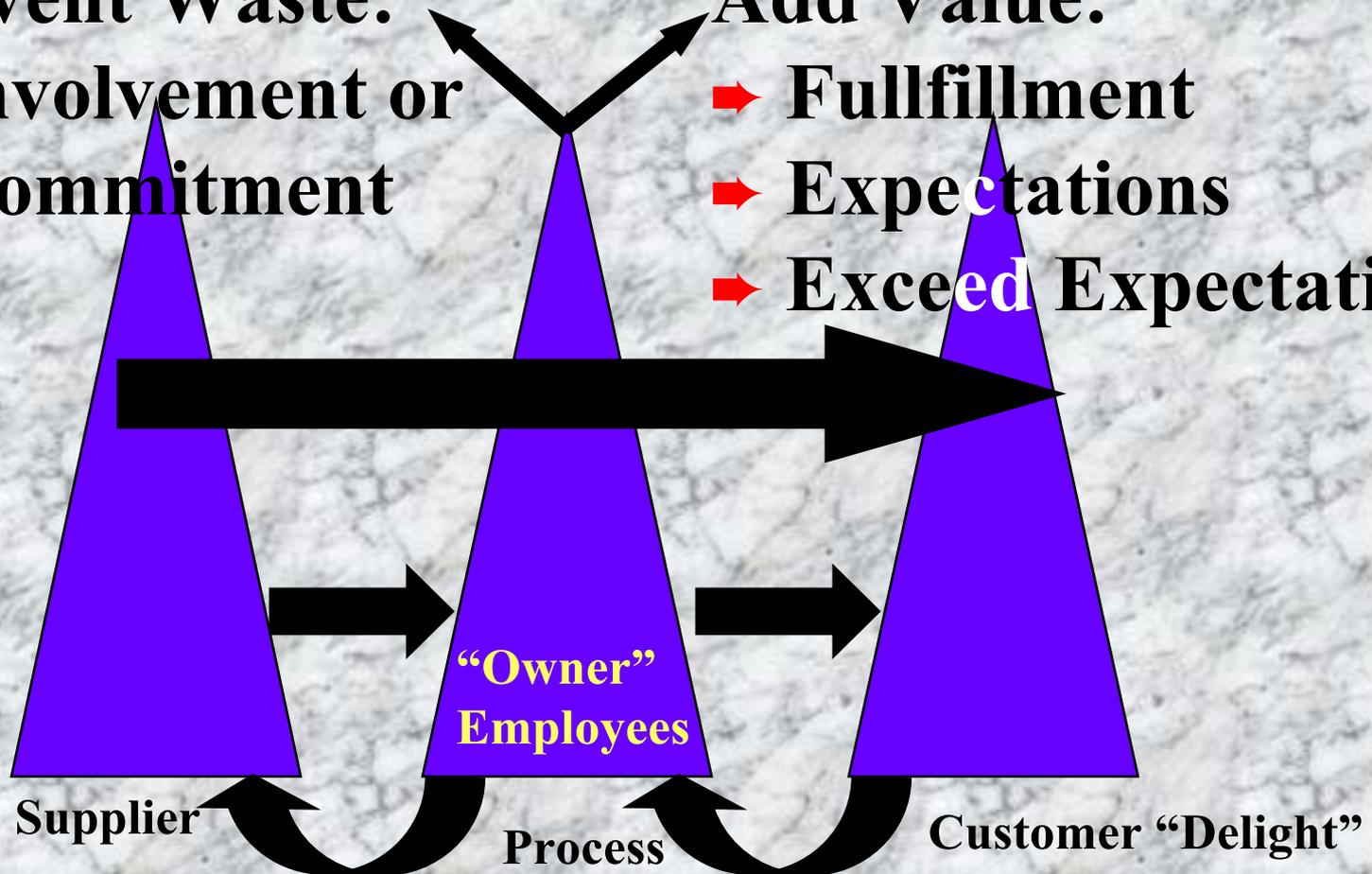
Can & should P2 become a strategic thrust for the Organization?

Prevent Waste:

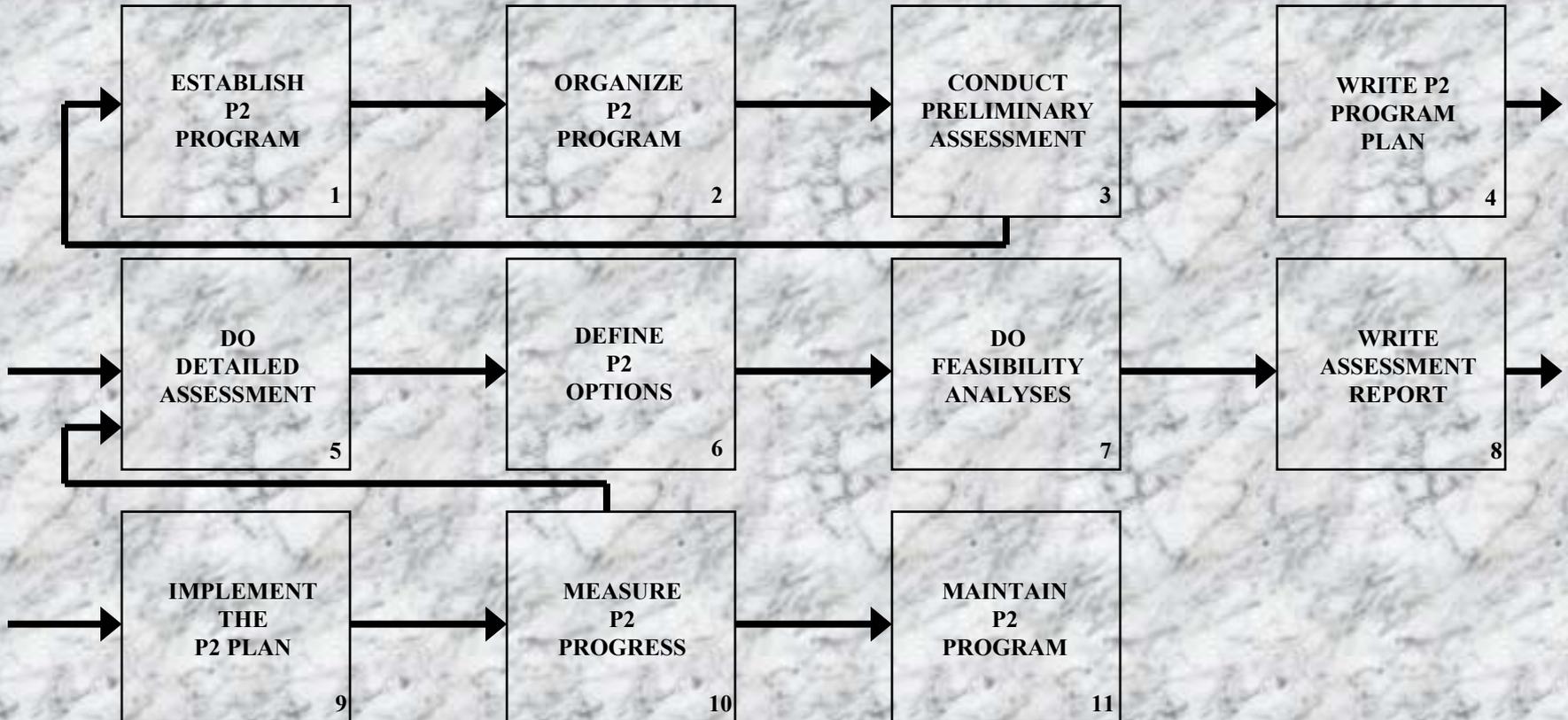
- ➔ Involvement or
- ➔ Commitment

Add Value:

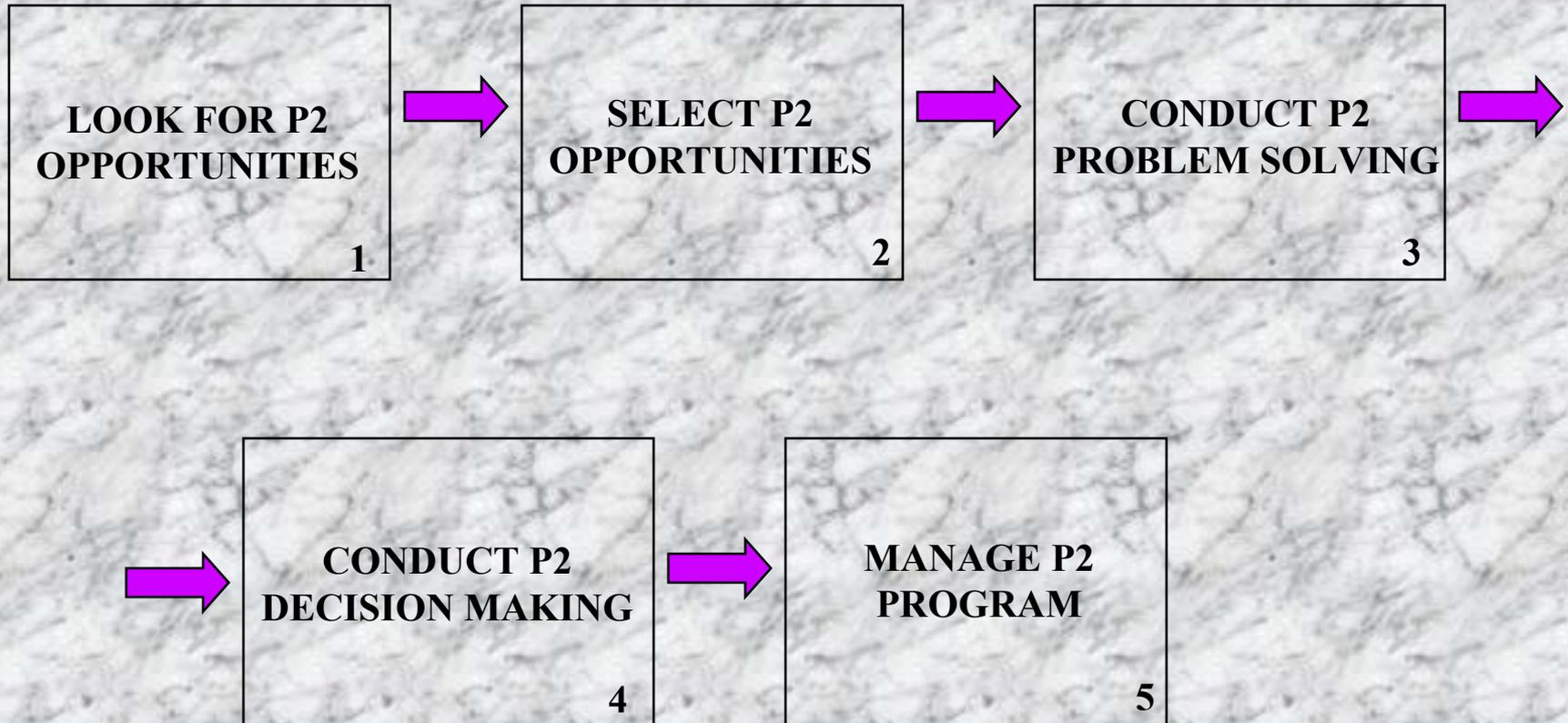
- ➔ Fullfillment
- ➔ Expectations
- ➔ Exceed Expectations



P2 Traditional Approach



An Alternative Approach to a P2 Program



P2 Program Paradigm Shift

Old Paradigm: “Doers”

Investigation & Implementation

- Creates P2 programs
- Creates new channels of communication
- Implements existing opportunities
- Focuses on information transfer
- Modifies existing activities
- Seeks to create awareness
- Builds upon trust

New Paradigm: “Finishers”

Long-term Organizational Change

- Integrates P2 w/ existing programs
- Co-opts existing channels of communication
- Prepares for new opportunities
- Focuses on information analysis
- Modifies existing contexts
- Seeks to move to action
- Builds on credibility

Parallel Paradigms

TQM	P2
Customer Satisfaction	Stakeholder Satisfaction
Continual Improvement	Continual Reduction
Mgmt. By Measurement	Monitor Waste
Maximize Productivity	Minimize Waste
Zero Defects	Zero Emissions

P2 “Sustainable” Phases

Payoff

What

When

Big ROI
“Today”

OPERATIONS

Now

Smaller
ROI
“Soon”

EQUIPMENT/
SYSTEMS

Near-term

Smallest
ROI
“Future”

PRODUCTION
PROCESS

Long-term

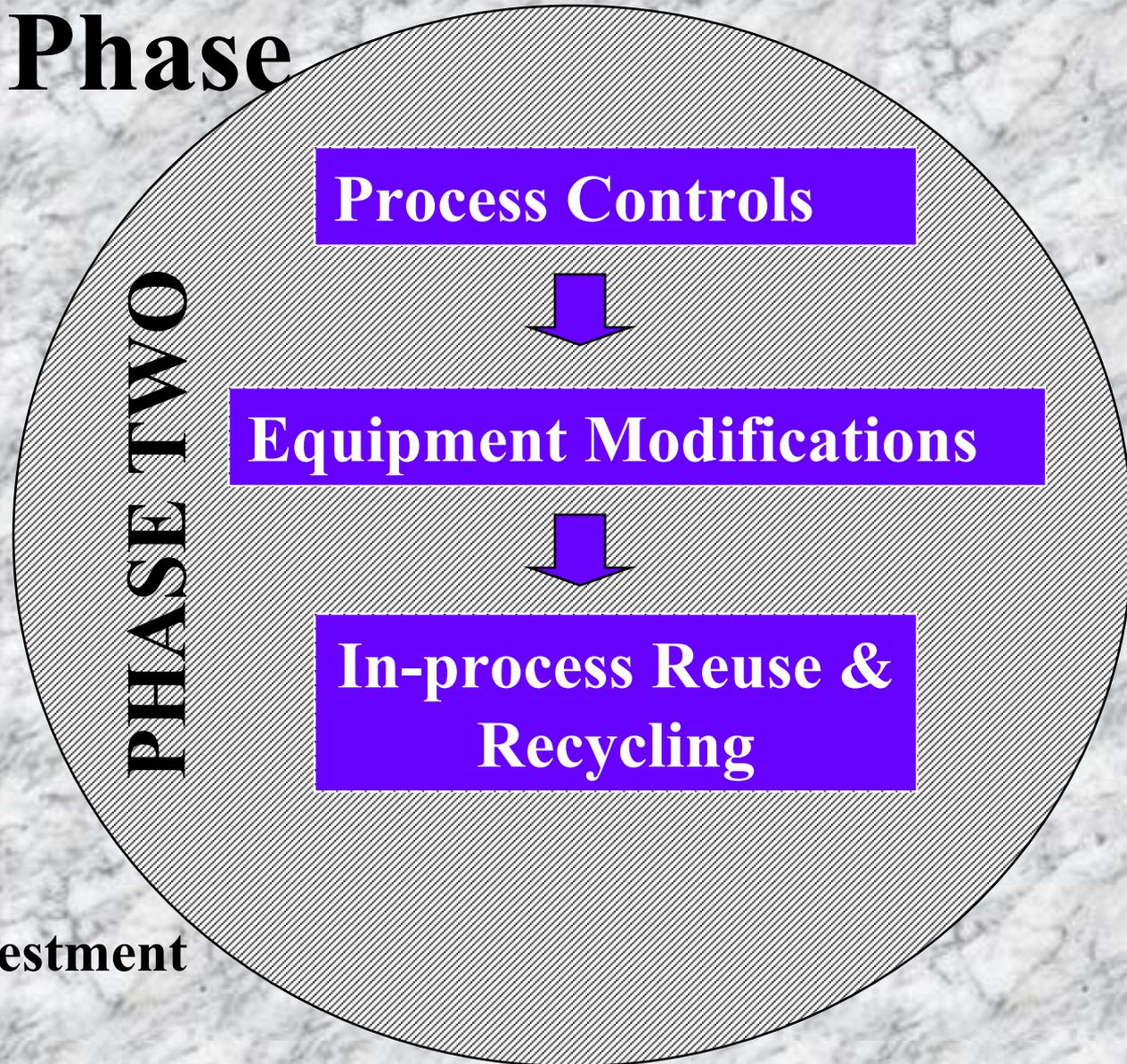


Source Reduction Operation Phase



**0-6 months, Big Return on
Investment**

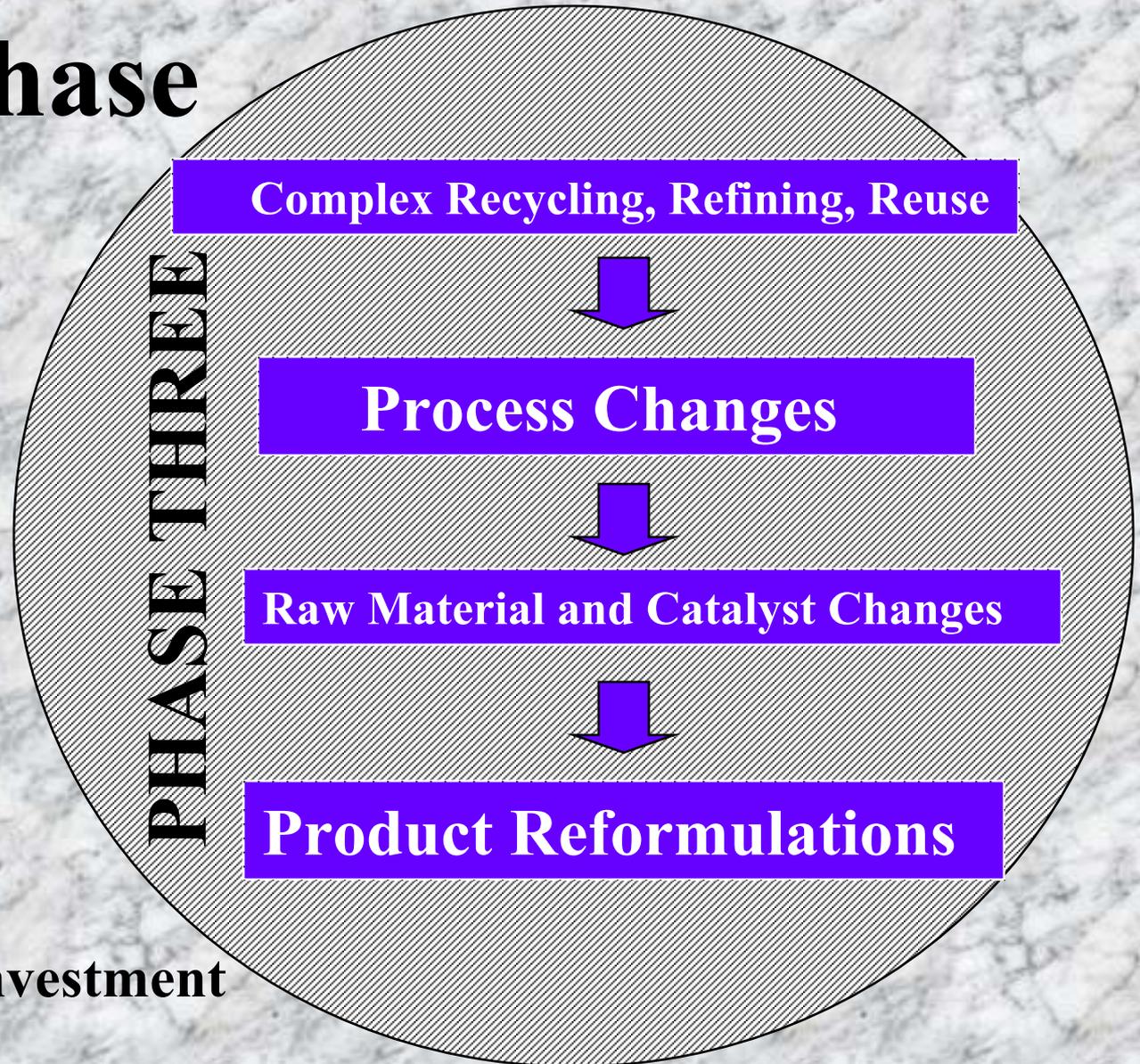
Source Reduction Equipment Phase



6 months - 2 years

Some Return on Investment

Source Reduction Process Phase



2 years - 5 years

Little Return on Investment

P2 Perspective: Minimization

- Reduce Wastes, Emissions & Discharges**
- Reduce Materials Usage & Losses**
- Reduce Toxics Use with Alternative Materials**
- Conserve & Reduce Water Usage**
- Conserve & Reduce Energy Usage**

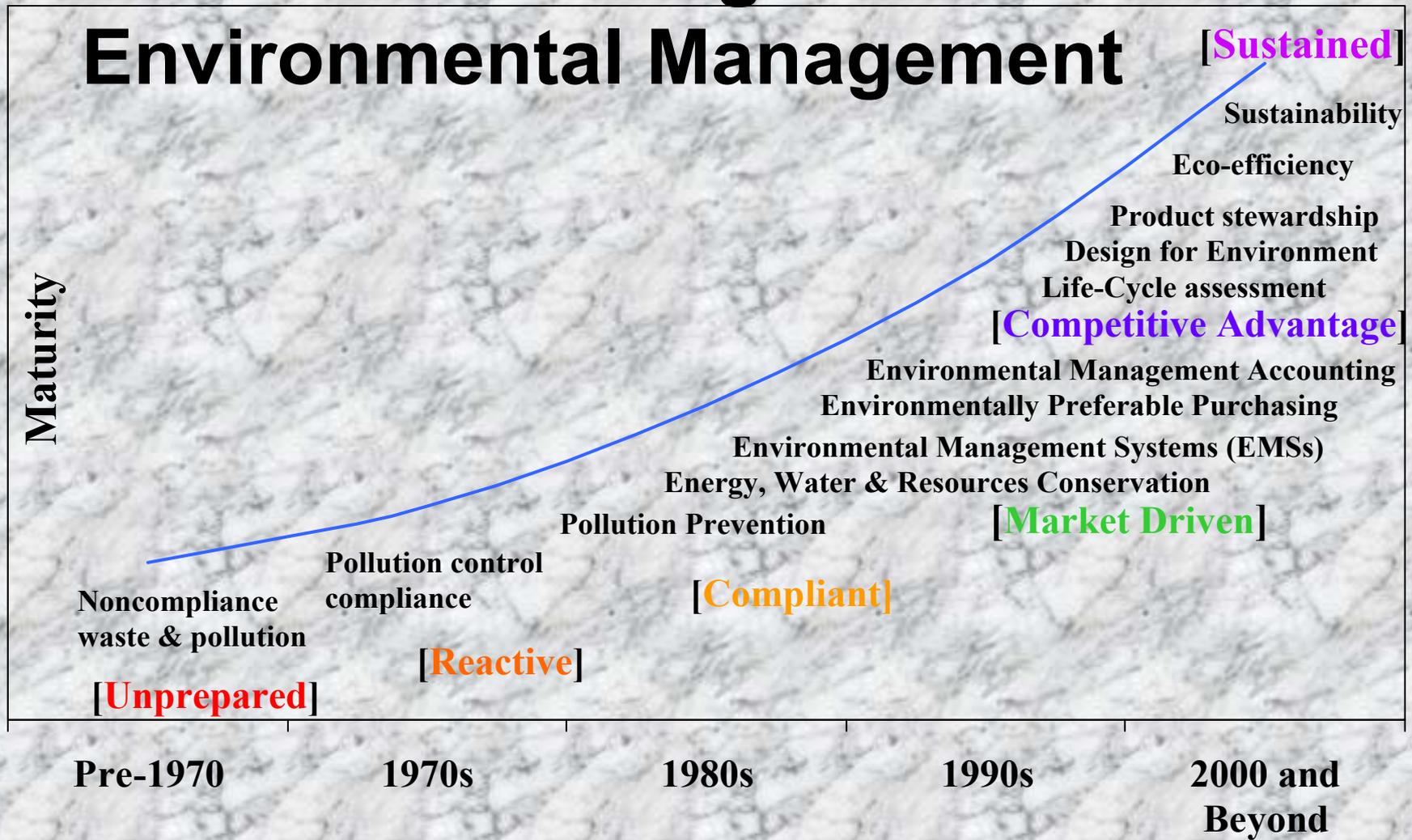
Business Perspective: Optimization

- Increase Market Share**
- Improve Cash Flow**
- Reduce Cycle Time**
- Reduce Set-up Time**
- Reduce Work In-Progress**
- Reduce Defect & Reject rate**
- Improve Flexibility of Manufacturing**
- Reduce Production Bottlenecks**

Integrating P2 into Existing Programs

- Productivity Enhancement**
- Quality Management Systems**
- Preventive Maintenance**
- Operation Automation**
- Inventory Control (JIT)**
- Product Development**
- Computer Integrated Mfg.**
- Employee Health & Safety**
- Environmental Management**

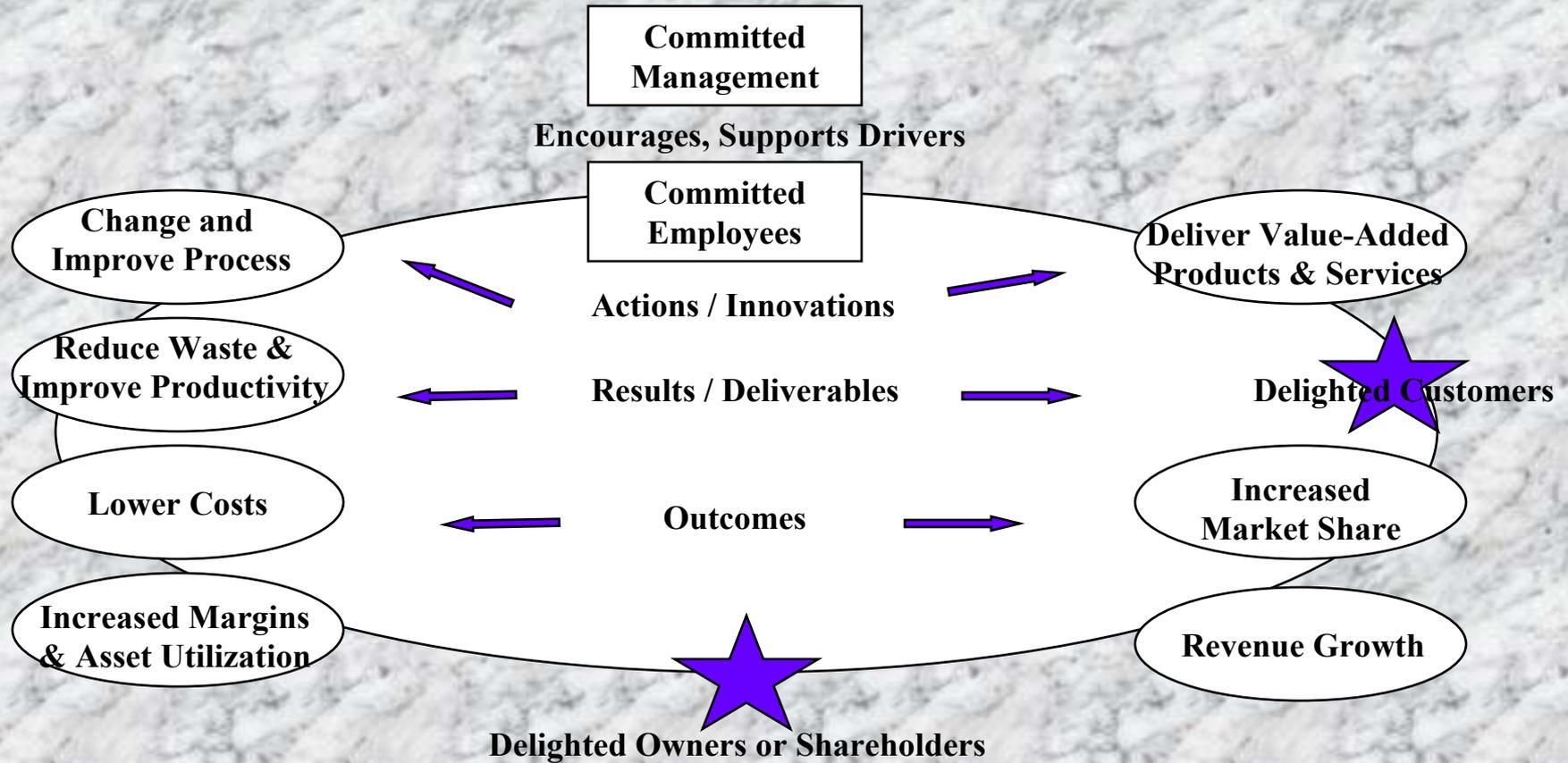
Evolution of an Organization's Environmental Management



4 Challenges

- ❑ **Shift OUR Goals: “A goal is a dream with a deadline!”**
- ❑ **Need more Coordination & Leadership**
- ❑ **Patience in Measuring Results**
- ❑ **It’s not just Technology - - How do organizations change?**

How Environmental Management Supports a Business



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*Next Steps: Take a New Look
at P2 Implementation!*

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