Chemical Management Services: a supply-chain approach to reducing chemical use

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What is the Chemical Strategies Partnership?

- The Chemical Strategies Partnership (CSP) is a non-profit project funded by foundations, government, and private companies.

- CSP is helping to promote the economic and environmental benefits of chemical management services (CMS).

CSP Mission
To reduce chemical use, waste, and cost through transformation of the chemical supply chain.
Chemical Strategies Partnership (CSP)

**Funders**
- Foundations
- Government
- CMS Forum companies

**CSP Pilot companies**
- Raytheon Company
- Nortel
- Seagate Technology
- Analog Devices
- SLAC-Stanford/DOE lab
- Dartmouth College
- UC Merced
- Hyundai Motor Company
- Metal-working co’s.

**CMS Forum**
- Tier I CMS Providers
- Tier II suppliers
- Customer Co’s
- Other stakeholders
Chemical Management Services (CMS) is a market-based approach to reducing chemical use and costs

• A strategic, long-term relationship in which a customer contracts with a service provider to supply and manage the customer's chemicals and related services

• The provider's compensation is tied primarily to quantity and quality of services delivered, not chemical volume

• Goes beyond invoicing and delivering product; CMS optimizes processes and continuously reduces chemical lifecycle costs, risk, and environmental impact

• These chemical services are often performed more effectively and at a lower cost than companies can do by themselves
CMS...managing the entire chemical lifecycle

The Chemical Lifecycle

upstream

downstream

Chemical management can cost up to $10 for every $1 of chemical purchased.
CMS can encompass a range of activities

### Information management

<table>
<thead>
<tr>
<th>Procurement</th>
<th>Inspection</th>
<th>Inventory</th>
<th>Delivery</th>
<th>Use</th>
<th>Collection/disposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Best price purchasing</td>
<td>• QA/QC testing</td>
<td>• Inventory mgmt</td>
<td>• JIT systems</td>
<td>• Monitoring and controlling</td>
<td>• Waste collection</td>
</tr>
<tr>
<td>• Manage Tier 2 suppliers</td>
<td></td>
<td>• Container mgmt</td>
<td>• Point-of-use delivery</td>
<td>• Use reduction initiatives</td>
<td>• Manage transportation and disposal activities</td>
</tr>
<tr>
<td>• Gateway for chemical clearances</td>
<td>• Minimum on-site storage</td>
<td>• Reduce unused product</td>
<td>• Substitute or eliminate chemicals</td>
<td>• Recycling, secondary markets</td>
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</table>
Under the CMS model, formerly conflicting incentives are now aligned

**Traditional relationship:**
Conflicting incentives

- **Supplier**
  - wants to increase
  - Material (cost, volume)

- **Buyer**
  - wants to decrease

**CMS model:**
Aligned incentives

- **Service provider**
  - wants to decrease
  - Lifecycle costs (material, labor, waste management)

- **Buyer**
  - wants to decrease

Changing the supply chain model results in potential costs savings and environmental gains
CMS is a growing trend in the US

CMS market penetration across sectors

- Automotive ≈ 50-80%
- Aerospace ≈ 10%
- Metalworking ≈ 20%
- Electronics ≈ 35%

Range in types of CMS Providers

- Stand-alone chemical service providers
- Chemical manufacturers with service offerings
- Chemical distributors with service offerings

Source: CMS Industry Report 2000, Chemical Strategies Partnership
Overall cost savings reported by CMS customers are significant

**Key results**
- 5-25% savings in first year
- 30-80% of long-term savings from reducing management costs
- 80% of customers report chemical volume reduced

**Savings as a percent of total program costs**

Source: CMS Industry Report 2000, Chemical Strategies Partnership
Improved data management is the benefit most widely cited by customers

Benefits cited, percent of respondents

- **Improved data management**: 87% (Customers), 93% (CMS providers)
- **Reduced chemical purchase costs**: 80% (Customers), 87% (CMS providers)
- **Improved inventory management**: 80% (Customers), 93% (CMS providers)
- **Improved delivery**: 67% (Customers), 73% (CMS providers)
- **Reduced waste costs**: 67% (Customers), 73% (CMS providers)
- **Reduced labor costs**: 53% (Customers), 60% (CMS providers)
- **Reduced overhead/ fixed costs**: 40% (Customers), 73% (CMS providers)
- **Decreased process down time**: 33% (Customers), 73% (CMS providers)

Source: CMS Industry Report 2000, Chemical Strategies Partnership
Environmental benefits are especially strong

Benefits cited, percent of customer respondents

- Chemical use reduction: 80%
- Environmental information management: 73%
- Improved MSDS management: 53%
- Elimination of hazardous materials: 47%
- Waste reduction: 40%
- Waste cost reduction: 27%
- Other: 40%

Source: CMS Industry Report 2000, Chemical Strategies Partnership
Case study: General Motors

Programs in over 90% of plants worldwide

- Average total chemical use reduction of 30%
- Total cost savings above 30%
- Environmental benefits: Reductions achieved over 6 years in one CMS contract
  - 54% decrease in purge solvent
  - 77% decrease in paint stripper
  - 80% decrease in solvent masking
  - 75% decrease in VOC emissions
  - 83% reduction in detackification chemicals
CSP pilot case study: Raytheon Company

Streamlined Operations (~20,000 chemicals, 1000 waste profiles)
- Automated ordering, chemical gate-keeping, consolidated sourcing
- On-line MSDS and EHS data for reporting
- Chemical use and waste generation tracking
- Procurement and inventory management

Improved Service and Quality
- On-time delivery rose from a base of 82% to an average of 91% in the first 5 months
- Scrap rate reduced by 250%

Reduced Costs
- Payback of the program in the first 6 months.
- 10-20% net savings in the first 2 years,
- Expected savings over the 5 year contract is 30-40%
CSP pilot case study: Seagate Technology

Benefits realized in first twelve months at one facility

- Aligned incentives and guaranteed savings – supplier generates no profit from volume sales
- Reduced onsite chemical inventory/handling (JIT)
  - Reduced 10,000 sq. ft. of inventory by 50%
  - Reduced $800,000 in carrying costs of chemicals
  - Eliminated chemical scrap – approx. 7% of inventory
- Improved chemical processes/shared best practices
  - Photo-resist process: substituted more benign product and extended bath life 3-5 times, resulting in savings of $50,000/month
- Eliminated distributor markup on chemicals
CSP’s Approach: conduct pilot programs to assist manufacturing companies in assessing their total chemical lifecycle costs and developing a CMS program.

**Decision Point: Is CMS right for my company?**

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<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
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<tbody>
<tr>
<td><strong>Planning</strong></td>
<td><strong>Baseline chemical costs</strong></td>
<td><strong>Develop scope of program</strong></td>
<td><strong>Engage a chemical service provider</strong></td>
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<tr>
<td>- Form team</td>
<td>- Map processes</td>
<td>- Select chemical/lifecycle scope</td>
<td>- Distribute RFP</td>
</tr>
<tr>
<td>- Select champion</td>
<td>- Cost accounting</td>
<td>- Develop RFP</td>
<td>- Select CMS provider</td>
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<td>- Create compensation/incentive options</td>
<td>- Negotiate contract</td>
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CSP continues to address barriers and promote CMS

- Conduct pilot programs to accelerate adoption in sectors already using CMS (electronics, aerospace)
- Introduce CMS into new sectors (pulp and paper, university/research labs, pharma/biotech, pulp and
- Develop tools (metrics, update manual, etc.)
- Disseminate information (workshops in Dallas, Korea, UK)
- Begin initiatives internationally (Asia, Europe)

*CSP conducts these activities with support from US EPA, state governments, foundations, and CMS Forum members*