

## Alternative Assessment Framework

An alternatives assessment is one element of risk management, applicable when there are concerns that the risks of a chemical substance in an intended use cannot be appropriately managed.

An alternatives analysis compares a chemical and its potential alternatives to understand whether any undesirable consequence (e.g., increased hazards, exposures, pollution and/or waste generation) associated with the use of an alternative. Inherent in any alternative analysis is the requirement that the alternative materials must equal or exceed the functional use and performance requirements of the original material. Failure to meet performance requirements often results in off-spec and/or undesired products that end up as wastes. Alternatives must also be cost competitive.

An alternative analysis should include consideration of a number of elements related to the inherent properties of the chemicals, the manufacturing process, and the final product itself, including any potential exposures to sensitive subpopulations. Manufacturers can use either qualitative or quantitative information as appropriate. An alternatives assessment of a chemical and its alternatives should consider the following key attributes of each substance:<sup>1</sup> (See figure 1)

1. Chemical/material/process information
  - a. Chemical/materials hazard properties (physical-chemical properties, human health hazards; environmental hazards)
  - b. Environmental fate and transport
  - c. Use requirement description (e.g., chemical, physical, mechanical)
  - d. Process safety considerations
2. Exposure information
  - a. Environmental releases<sup>2</sup>
  - b. Product user exposure description
  - c. Workplace exposure description
3. Risk Assessment and Comparison
4. Performance Considerations
  - a. Performance assessment, including technical specifications, quality, and costs
  - b. Regulatory status
5. Resource Conservation
  - a. Energy use comparison
  - b. Greenhouse gas comparison
  - c. Water use comparison
6. Comparison of a Chemical and its Possible Alternatives
  - a. Performance summary<sup>3</sup>
  - b. Health and Safety summary
  - c. Resource Conservation summary
  - d. Economic Impact and Feasibility summary

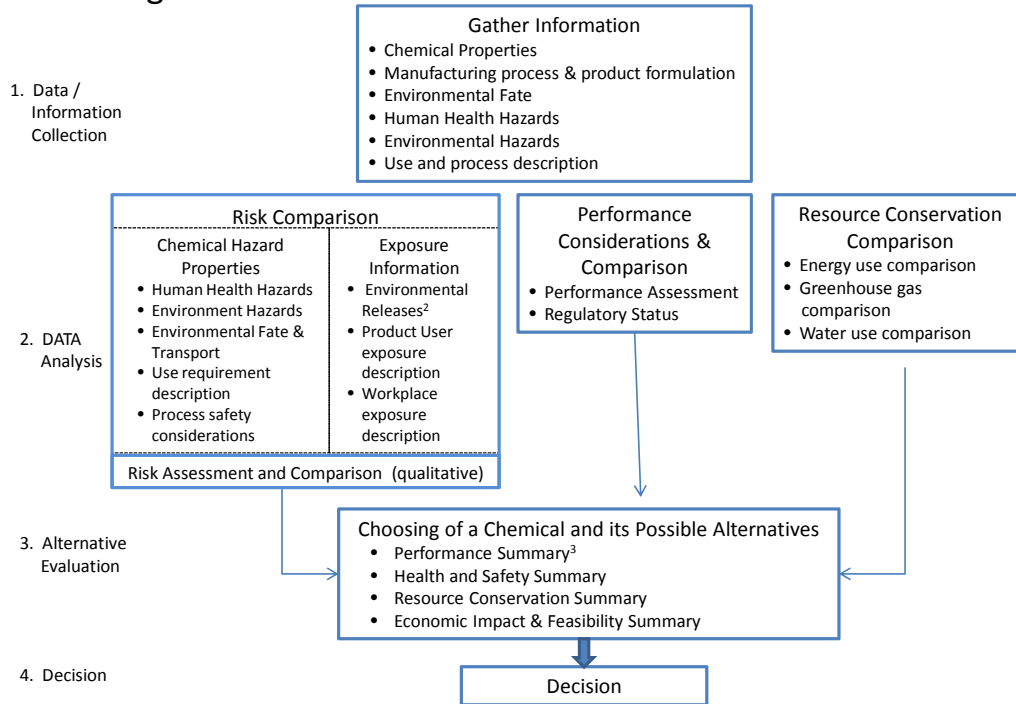
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<sup>1</sup> Some analyses identify added components for the decision making process. See, for example, EPA's Cleaner Technologies Substitutes Assessment accessible at <http://www.epa.gov/dfepubs/tools/ctsa/index.htm>.

<sup>2</sup> Anticipated releases of the chemical of concern from the product to air, water, and/or soil during the anticipated consumer use and end of life.

<sup>3</sup> The performance summary should include information on consumer expectations about performance and benefits, regulatory requirements for performance, and performance specifications that affect the consideration of the baseline chemical and potential alternatives.

Figure 1: Framework for an Alternatives Assessment



<sup>2</sup> Anticipated releases of the CHCC from the product to air, water, soil during anticipated consumer use and end of life.

<sup>3</sup> The performance summary should include information on contract performance specifications that affect the consideration of the baseline chemical and potential alternatives; consumer expectations about performance and benefits; and regulatory requirements for performance (i.e., fire safety).