

## Cost-Benefit Analysis Framework: Proposed Volatile Organic Compounds (VOC) Concentration Limits for Certain Products Regulations (proposed Regulations)

This document has been prepared by Environment and Climate Change Canada (ECCC) to inform stakeholders of the Cost-Benefit Analysis assumptions prior to the publication of the proposed Regulations in the Canada Gazette, Part I.

### Analytical Framework

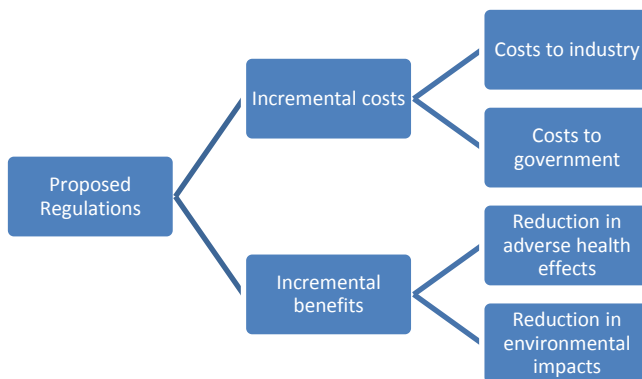
The Cost-Benefit Analysis (CBA) will compare the base scenario to the policy scenario to determine the incremental costs and benefits of the proposed Regulations. In this comparison, the base scenario maintains the status quo. In that case, Canadians and the environment would continue to be exposed to elevated VOC levels, which can cause adverse health effects and environmental impacts.

The policy scenario focuses on the implementation of the proposed Regulations which would prohibit the manufacture and import of approximately 130 product categories and subcategories containing concentrations of VOCs that exceed their respective category specific-limits, unless an alternative regulatory compliance option is used. It is expected that the majority of manufacturers will reformulate non-compliant products. However, there are companies which produce/import both compliant and non-compliant products in the same category and could discontinue the non-compliant product.

Behaviors in the base and policy scenarios are based on the “*Technical and Socio-Economic Study on Certain Products Containing Volatile Organic Compound*” conducted by Toxecology Environmental Consulting Ltd. in 2014.

### Cost-Benefit Analysis (CBA)

The CBA will evaluate impacts of the policy scenario as illustrated below:



### Costs of Policy Scenario

#### Business Compliance Costs:

- The cost analysis will estimate the compliance cost to businesses. This consists of recurring raw material costs and non-recurring reformulation costs.
- Depending on the product, some manufacturers may have to switch to more expensive raw material substitutes. The cost of compliant raw material substitutes can vary from -\$0.1 to \$4 per kg of products and it is expected that raw material costs will constitute the majority of the compliance costs for most product categories. This is based on data obtained through industry wide surveys and research reported in the “*Technical and Socio-Economic Study on Certain Products containing volatile Organic Compound*” conducted by Toxecology Environmental Consulting Ltd. in 2014.
- Non-recurring reformulation costs have been estimated to be \$23,000 per product per company based on average time and laboratory costs required for the reformulation of a typical product. This data has been obtained from the “*Technical and Socio-Economic Study on Certain Products containing volatile Organic Compound*” conducted by Toxecology Environmental Consulting Ltd. in 2014.

- Previous analysis has shown that most imported products are being imported from the United States and many would already be compliant with the California Air Resource Board VOC Regulations. Importers would be able to switch from purchasing non-compliant products to purchasing compliant products in the same category.
- Some or all of the costs to businesses may be passed onto consumers.

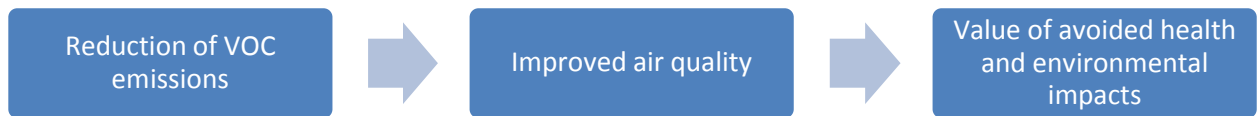
*Business Administrative burden costs:*

- There would be no expected administrative requirements for businesses unless a business applies for one of the voluntary permit schemes. Any information on how many companies would be interested in applying for one of the permitting schemes would help further inform the regulatory analysis.

Benefits of Policy Scenario

The proposed Regulations are expected to lower VOC emissions and result in both health and environmental benefits:

**Health and environmental benefits framework**



*Health Benefits associated with VOC reductions:*

- Reducing VOC emissions would lead to reduced incidence of premature death, hospital admissions, doctor visits, emergency room visits, lost work and school days.
- Health Canada has assessed a number of VOC emission reductions scenarios using the Air Quality Benefits Assessment Tool (AQBAT), which estimates the health impacts of changes in local air quality associated with these scenarios. The resulting Canadian health benefit estimates frequently fall within the Office of Management and Budget (OMB) estimate that reducing VOC emissions produced benefits in the range of \$1,000 to \$4,500 per tonne (in 2016 CAD).
- Most significant health benefits are expected to be seen in urban areas with high population densities.
- The modeled benefits do not take into account improvements in indoor air quality associated with VOC reductions.

*Environmental Benefits associated with VOC reductions:*

- Reducing VOC emissions would lead to environmental benefits including reduced damages to ecosystems, visibility and improved yields in agriculture and forestry.
- Benefits are predominantly expected in populated areas and in regions with persistently low air quality.
- The environmental benefits will be explained qualitatively within the RIAS.

CBA Assumptions:

- Assumptions made regarding air quality modeling:
  - VOC reductions are proportional to population by province and census area.
  - Reductions are consistent over daily and seasonal cycles.
- Assumptions regarding VOC reductions:
  - It was assumed that all VOCs contained in the products are emitted to the air, therefore VOC quantities reported are representative of total VOC emissions.
- Assumptions made regarding cost calculations:
  - Cost calculations will assume that all products will be reformulated despite the availability of options to discontinue a product and to use an alternative product.
  - Cost calculations will assume that manufacturers will not have to make capital investments to comply with the proposed Regulations.