REVIEW OF ISSUES AND OPTIONS

AS PART OF
THE REGULATORY REVIEW PROCESS
UNDER SECTION 11
OF THE
BRITISH COLUMBIA
MOTOR VEHICLE EMISSION REDUCTION REGULATION

PREPARED FOR
THE MINISTER OF ENVIRONMENT, LANDS AND PARKS

DECEMBER 23, 1998

PREFACE

This report has been prepared to meet the requirement for a review of the effectiveness of British Columbia's 1995 Motor Vehicle Emission Reduction Regulation to be completed by December 31, 1998.

The report presents a review of issues and options, prepared by the Rogoza Consulting Group, in consultation with the minister's Cleaner Technology Vehicles Committee, and will be submitted to the minister for consideration of appropriate responses to the issues identified.

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I. EXECUTIVE SUMMARY

BACKGROUND

Air Quality Problems; Vehicle Contribution

Cleaner air is a major environmental goal of the Government of British Columbia. In some regions of British Columbia, periods of poor air quality are currently associated with significant negative impacts on public health, quality of life, tourism, and crops and other vegetation.

The single largest source of air pollution in the province is tailpipe emissions from vehicles. This makes the province, especially urban areas such as the Lower Fraser Valley, similar in many respects to the situation in California, where vehicles are also the largest smog contributors. It has been forecast that as population and economic activity increases, an additional million vehicles will be registered in the Lower Fraser Valley by the Year 2020, and that unless actions are taken to reduce emissions, air quality will deteriorate in that region.

British Columbia Response

In response to this situation, British Columbia developed a number of initiatives to reduce emissions from vehicles. The tailpipe testing program known as AirCare began operation in 1992, targeting emission reductions from existing vehicles registered in the Lower Fraser Valley. Under this program emissions from the million vehicles tested annually have been reduced by 25 to 30%.

At that time, there were also significant developments in the United States to control emissions from new vehicles. US federal regulations on vehicles and fuels were not fully reflected in Canada. Even more stringent requirements existed in California, and were under consideration in several other states with significant smog problems.

Convinced of the need for action, the province began implementing its Clean Vehicles and Fuels Program in 1994. British Columbia also led national discussions on these issues through the Canadian Council of Ministers of Environment (CCME), which resulted in recommendations being made on actions that should be taken on the issues of cleaner fuels and vehicles. As a result of the CCME process, national initiatives on both vehicles and fuels have developed since 1995, following British Columbia's lead.

One of the most significant actions taken under British Columbia's Clean Vehicles and Fuels program was the development and proclamation of the *Motor Vehicle Emission Reduction Regulation* under the *Waste Management Act*, proclaimed in December, 1995.
Three principal requirements of the regulation, are:

- Beginning in model year 1998, vehicles sold in the province must meet U.S. Federal Tier I emission standards

- Beginning in model year 1998, sales targets have been established for the introduction of cleaner technology vehicles in order to address both local air pollution and greenhouse gas emission issues
- Beginning in model year 2001, vehicles sold in the province must meet California's Low Emission Vehicle standards

In addition to this regulation a number of other regulations were enacted as part of the Clean Vehicles and Fuels Program. These include:

- The *Emission Warranty Regulation*, which requires vehicle manufacturers to ensure that new vehicles meet their emission standard up to 160,000 km.
- The *Cleaner Gasoline Regulation* which mandates numerous improvements to gasoline sold in the province including a lower sulphur content.
- The *Lower Sulphur Diesel Regulation* which reduces the amount of sulphur permitted in diesel fuel sold for on road use.

EVENTS IN OTHER JURISDICTIONS

When this regulation was enacted it was recognized that there were on-going regulatory and technical developments in the United States and Canada that would likely affect details of this regulation after it had been proclaimed. In order to ensure that this regulation was responsive to these developments a ministerial review was incorporated into the regulation, as well as an automatic repeal if equivalent national regulations were proclaimed.

Since December, 1995 a number of major events have occurred that suggest amendments to this regulation should be considered. These events include:

Vehicle Technology

- Effective 1998, the U.S National Low Emission Vehicle program (NLEV) will result in California LEV technology vehicles being required for sale in all states beginning in 2001 model year
- Effective the 1998 model year, a Canadian Government regulation requires Tier I emission standards for all new vehicles sold
- A Canadian Gazette 1 regulation requires NLEV standards beginning in 2001; some manufacturers have begun to voluntarily deliver NLEV vehicles to the Canadian market
- Effective 1998, the sale in California of numerous gasoline vehicle models that meet LEV standards, with some of these now being sold in BC
- Proposed in 1998, California's next generation set of more stringent emission standards for cars and light trucks known as LEV II
- US Environmental Protection Agency has also proposed to develop Tier II standards for model year 2004 or beyond

Compatible Fuels

- Effective 1998, the Canadian Government rescinded restrictions on MMT, raising issues of potential impact on LEV technology

- Proposed in 1998, Canadian Government regulations lowering sulphur content of Canadian gasoline to California's standard by January 1, 2005
- Both EPA and California are considering future fuel quality requirements to support the introduction of cleaner technology vehicles

REVIEW OF THE REGULATION

Section 11 of the *Motor Vehicle Emission Reduction Regulation* specifies that the Minister (of Environment, Lands and Parks) must review the administration and content of the regulation before December 31, 1998.

Section 11 of the regulation sets out five criteria that must be used as a basis for the review of this regulation. These criteria include:

- cost-effectiveness;
- effectiveness in meeting air quality objectives;
- consistency with respect to regulatory developments in other jurisdictions;
- technological changes and the availability of fuel compatible with LEV's,
- any other matters of concern to the minister.

This Report examines issues under each of the five areas identified in Section 11 of the regulation. In each case the report categorizes options related to a particular issue in one of the following ways:

- Near Term - Issues which could be resolved during 1999
- Medium Term - Issues which require more analysis and consultation
- Longer Term - Issues which should be tracked for future resolution

REVIEW OF ISSUES AND OPTIONS

This review identifies issues pertaining to vehicles and fuels and possible options for which action should be considered. From a policy perspective, options have been grouped under several approaches:

- Harmonization/Streamlining
- Renewed Leadership
- Complementary Actions

There are a number of similar options that can be applied to different issues. In some cases, compatible options are available from more than one policy approach (for example, near or medium term harmonization, with longer term tracking potentially leading to an opportunity for renewed leadership). In other cases, a choice between the different policy approaches is available in the near or medium term.

OVERVIEW OF MAJOR OPTIONS

Relaxation of British Columbia Requirements

Low emission vehicles will soon be required to be sold in the province. There remain important concerns regarding the extent to which MMT being used in British Columbia gasoline may negatively impact on the emission performance of these vehicles. A number of options have been identified which would result in the province relaxing its requirements such as:

- AirCare fail requirements could be relaxed to accommodate the potential for fuel quality to compromise emissions performance of new vehicles
- Emission warranty requirements could be relaxed if it can be demonstrated that fuel quality is compromising emissions performance of new vehicles

Harmonization/Streamlining

There are a number of actions the Ministry can take to reduce the regulatory burden of this regulation. Changes can be made in order to harmonize or streamline the regulation in response to regulatory actions taken in other jurisdictions. Examples of this type of option include:

Harmonization

- reference recent Canadian and U.S. federal vehicle emission standards, making it easier to comply without changing the intent
- permit "off-ramps" or regulatory relief for vehicle manufacturers who could demonstrate that fuel issues were resulting in new vehicles not being able to meet their emission standards
- seek Canadian offer for sale of a vehicle mix with significant greenhouse gas reductions (comparable to recent development in European Union)

Streamlining

- reduce administrative costs by reducing the amount of mandatory reporting.

Renewed Leadership

Given the forecast growth in the number of vehicles there continues to be opportunities for the province to implement measures which will result in even cleaner fuels and vehicles being sold in the province than is currently required. Examples of this type of option include:

- Taking action to label or restrict the use of MMT
- Amending the regulation to set legal targets for the sale of cleaner technology vehicles
- Amending BC regulations to follow California's proposed NMOG targets and future fuel quality requirements

Complementary Actions

The province has a number of policy, program and fiscal instruments that could be employed to complement the effectiveness of this regulation. For example:

- Implementing tax measures and other incentives to encourage the use of cleaner vehicles and alternative and renewable fuels

II. SUMMARY TABLE OF ISSUES AND OPTIONS

#	Issues	Options	Time Frame	Policy Approach
2.1	Incremental Cost of LEV's Operating On Gasoline	No New Option Identified	Near	status quo
2.2	Incremental Cost of LEV's Operating On Alternative Fuels	New Incentives To Reduce Price Gap	Medium	complementary action
2.3	Reducing Regulatory Overlap & Costs	2.3.1 Update Regulation To Facilitate Compliance 2.3.1 Reduce mandatory reporting 2.3.3 Harmonize With subsequent regulations	Near Near Medium	harmonize/streamline harmonize/streamline harmonize/streamline
2.4	Repeal of This Regulation	2.4.1 No Amendments Required 2.4.2 Amend Regulation To Permit CanLEV MOU 2.4.3 Amend Section 12 To Establish Minister's prerogative to repeal.	Near Medium Medium	status quo harmonize/streamline harmonize/streamline
3.1	Effectiveness in Targeting Key Air Quality Issues	No Amendment Required for Ozone or Fine Particulate Effectiveness	Near	status quo
3.2	Regulation's Affect on Emission Performance of LEV's	No Amendment Required	Near	status quo
3.3	Regulation's Influence On Achieving Air Quality Goals	See section 4 and 6 below		
4.1	Regulatory Consistency Across Jurisdictions	4.1.1 No Amendments Required 4.1.2 Amend Section 12 To Establish Minister's prerogative to repeal. 4.1.3 Adopt NLEV NMOG Schedule 4.1.4 Adopt California's NMOG Schedule 4.1.5 Amend Small Volume Manufacturer Exemption	Near Medium Medium Medium Medium	status quo harmonize/streamline harmonize/streamlineR enewed leadership harmonize/streamline
5.1	Sulphur Levels In Gasoline	5.1.1 No Amendments Required, or 5.1.2 Adopt NLEV "off ramps" 5.1.3 Exclude In-Use Requirements 5.1.4 Amend Emission Warranty Regulation 5.1.5 Amend AirCare Test Procedures 5.1.6 Adopt more stringent levels	Near Medium Medium Medium Medium Long	status quo harmonize/streamline relax BC requirements relax BC requirements relax BC requirements Renewed leadership
5.2	MMT In British Columbia Gasoline	5.2.1 No Amendment Required 5.2.2 Adopt NLEV "off ramps" 5.2.3 Exclude In-Use Requirements 5.2.4 Amend Emission Warranty Regulation 5.2.5 Amend AirCare Test Procedures 5.2.6 Restrict Sale of MMT 5.2.7 Pump Labeling of Gasoline Sold With MMT	Medium Medium Medium Medium Medium Medium Medium	status quo harmonize/streamline relax BC requirements relax BC requirements relax BC requirements renewed leadership renewed leadership
6.1	CTV Sales Targets	6.1.1 Broaden mandate to include fuels 6.1.2 Higher NMOG Credits For CTV's 6.1.3 Amend sales targets in schedule 2 6.1.4 Amend CTV Sales Target To Sales Mandate	Near Medium Medium Medium	harmonize/streamline renewed leadership renewed leadership renewed leadership
6.2	Greenhouse Gases	6.2.1 Voluntary Offer From Manufacturers 6.2.2 Credits Under GERT 6.2.3 Include High MPG Vehicles In CTV Defin.	Medium Medium Medium	harmonize/streamline harmonize/streamline renewed leadership
6.3	Financial Incentives For Renewable Fuels	6.3.1 NMOG Credits For Renewable Fueled Veh. 6.3.2 Amend Motor Fuel Tax Act 6.3.3 Technology Incentives	Medium Medium Medium	renewed leadership complentary action complentary action

1. PURPOSE OF THIS REPORT

BACKGROUND

Cleaner air is a major environmental goal of the Government of British Columbia. The single largest source of air pollution in the province is tailpipe emissions from vehicles. In response to this situation the Government of British Columbia has taken a number of initiatives to reduce emissions from vehicles.

Cleaner Vehicles & Fuels

British Columbia first addressed the issue of emissions from existing vehicles in 1992 when it established AirCare, the tailpipe emission-testing program for vehicles registered in the Lower Fraser Valley. The vapour pressure of gasoline was also regulated at that time. Under the AirCare program over a million old and new vehicles are tested annually. In order to further reduce emissions from existing and future vehicles, the province began implementing its Clean Vehicles and Fuels Program in 1994. The prime basis for this program was to emulate, as appropriate, California's regulations requiring the sale of both cleaner fuels and Low Emission Vehicles.

British Columbia's *Motor Vehicle Emission Reduction Regulation* under the *Waste Management Act* was proclaimed on December 7, 1995. This regulation requires that vehicles sold in the province beginning 1998-model year must meet the U.S. Federal Tier 1 emission standards. The regulation also requires the sale of lower emission vehicles that meet California's Low Emission Vehicle emission standards starting in model year 2001. As well, the regulation sets out sales targets for the introduction of certain cleaner technology vehicles beginning in model year 1998.

An associated regulation proclaimed in early 1996, the *Emission Warranty Regulation*, requires vehicle manufacturers to ensure that new vehicles sold in the province continuously meet their emission standards up to 160,000 km. Manufacturers are responsible for repairing the emission control systems of vehicles that have an emission warranty in effect and fail the AirCare test. British Columbia is the only jurisdiction in Canada that requires both the sale of California LEV vehicles and emission warranty support by manufacturers.

A prime policy goal has been to ensure that the quality of fuels does not negatively impact on the emissions performance of current or future Low Emission Vehicles. In 1994 the *Lower Sulphur Diesel Regulation* was enacted and in 1995 the *Cleaner Gasoline Regulation*, which mandates numerous improvements to gasoline sold in the province, was proclaimed. A key outcome of this latter regulation was that the sulphur levels of gasoline sold in the province will be, effective January 1, 1999, much lower than that sold elsewhere in Canada.

Greenhouse Gas Emissions

Greenhouse gas emissions are an important policy issue for the Province. This issue has taken on increased importance as Canada has become a signatory to the Kyoto Protocol which has the effect of Canada committing to meeting an emission reduction target of 6% below 1990 emission levels by Year 2010.

In British Columbia, it is forecast that based on current usage patterns emission levels will be about 35% *above* the 1990 levels by the Year 2010 with about 40% of provincial greenhouse gas emissions related to the use of vehicles. The province's Greenhouse Gas Action Plan recognizes that a balanced approach is needed to stabilize and reduce greenhouse gas emissions from the transportation sector. British Columbia's Greenhouse Gas Forum also identified in its 1998 report the need for the province to take early action to mitigate greenhouse gas emissions from vehicles. One of the tasks of the Clean Technology Vehicle committee under this regulation is to take initiatives that will address the greenhouse gas issue.

KEY DEVELOPMENTS IN OTHER JURISDICTIONS

During the development of this regulation it was recognized that there were a number of on-going regulatory and technical developments in the United States and Canada that might affect this regulation after the regulation had been proclaimed. Since the regulation was enacted a number of major events have occurred that impact on this regulation. These are:

Canada

- The Canadian Government, through Transport Canada, passed a regulation effective September 1, 1997, requiring the sale of vehicles that are certified to meet Tier I emission standards.
- The Canadian Government, through Transport Canada, issued a Gazette 1 proposed regulation requiring the sale of LEV's in Canada beginning model year 2001. A number of manufacturers have introduced LEV technology vehicles in advance of this requirement.
- The Canadian Government, through Transport Canada, issued a regulation requiring that all heavy duty vehicles sold in Canada effective model year 1998 must meet the current US emission standards.
- The Canadian Government restricted the interprovincial movement of MMT (methylcyclopentadienyl manganese tricarbonyl), then in July 1998 rescinded its restriction.
- The Canadian Government announced in October 1998 its proposed regulations on lowering the sulphur content of all Canadian gasoline to the California standard by January 1, 2005 with an interim step of achieving a 150 PPM (parts per million) standard by January 1, 2002.

United States

- The United States Environmental Protection Agency's National Low Emission Vehicle program (NLEV) became law in 1998.
- The Environmental Protection Agency (EPA) in October, 1997 adopted a new emission standard for heavy-duty diesel engines used in trucks and buses.

- EPA has also proposed to develop Tier II requirements for light duty vehicles for model year 2004 or later, and is considering fuel requirements to support the introduction of cleaner technology vehicles.

California

- In California, numerous 1998 models operating on gasoline are being sold that meet LEV and ULEV standards.
- California relaxed its original sales mandate requirements for zero emission vehicles starting in model year 1998 and established contractual commitments with major vehicle manufacturers requiring that 10% of all new vehicles sold in that state beginning in model year 2003 would be zero emission vehicles.
- California has proposed a next generation set of more stringent emission standards for cars and light trucks known as LEV II, and is considering more stringent fuel quality requirements.
- The California Air Resources Board (CARB) in August 1998 named particulates, a component of diesel exhaust, as a cancer-causing "toxic air contaminant."

This report incorporates into its examination the importance and effect these events may have on this regulation.

REQUIREMENTS OF THIS REVIEW

This review is guided by the requirements found within the *Motor Vehicle Emission Reduction Regulation.* Section 11 of the regulation states:

The minister must, before December 31, 1998, review the administration and content of this regulation, including the fleet average NMOG requirements in sections 1 and 2 of Schedule 1 for the model year 2002 and subsequent model years, by considering all of the following:

a) the cost-effectiveness of this regulation;
b) the effectiveness of this regulation in meeting air quality objectives;
c) the consistency of this regulation with respect to regulatory developments in other jurisdictions;
d) technological changes and the availability of fuel compatible with anticipated lower emission vehicle technology;
e) any other matters of concern to the minister with respect to motor vehicle emissions.

This Report examines issues under the five areas identified in Section 11. In each case the report categorizes options on a particular issue as follows:

- Near Term - Issues which could be resolved during 1999
- Medium Term - Issues which require more analysis and consultation
- Longer Term - Issues which should be tracked for future resolution

Options are further categorized according to one of several policy approaches:

Status Quo:
No change is identified at this time

Relax BC Requirement:
The option identifies a means of dealing with an issue by relaxing an existing BC requirement (e.g. AirCare fail requirements could be relaxed to accommodate the potential for fuel quality to compromise emissions performance of new vehicles.)

Harmonization/Streamlining:
The option describes an approach to harmonize BC's approach with that of one or more other jurisdictions (e.g. With national regulations), or to reduce the administrative impact of the regulation without compromising its effectiveness (eg. Reduced mandatory reporting).

Renewed Leadership:
The option identifies an opportunity for renewed British Columbia leadership (e.g. New regulatory targets)

Complementary Action:
The option identifies a policy or other action outside the regulation which would complement its effectiveness (e.g. Tax treatment of fuels)

2. REVIEW CRITERIA - Cost Effectiveness Of The Regulation

BACKGROUND

The British Columbia regulation was enacted to ensure that the lowest emission vehicles available were sold in the province in order to reduce tailpipe and greenhouse gas emissions. The regulation accomplishes this objective by imposing new emission standards for each new vehicle sold in the province. As well, the regulation permits a manufacturer to market any combination of vehicles that meet TLEV, LEV, or ULEV tailpipe standards as long as the average Non-Methane Organic Gas (NMOG) fleet average emissions standard of 0.075 grams/mile is satisfied.

In response to local air quality problems a number of U.S. states followed California's lead by adopting the California Low Emission Vehicle (LEV) tailpipe standard. This circumstance led to a proposal by the vehicle manufacturers for an U.S. national LEV program (NLEV) that would ensure a national harmonized market for LEV's. After much debate the United States Environmental Protection Agency promulgated its NLEV rule in 1998. This rule has the effect of requiring the sale of LEV's across the United States and the mix of vehicles sold will result in an NMOG fleet average of 0.075 gm/mile in model years 2001- 2004. The NMOG fleet average for these model years under the NMOG program is identical to that contained in Schedule 1 of British Columbia's regulation.

Previous to the enactment of the British Columbia regulation the province assessed the California standards and concluded that LEV vehicles, if produced in large volume, could be sold to consumers at a low incremental cost/vehicle. At the same time it was recognized that a British Columbia regulation requiring the sale of LEV's on a timetable similar to California's could play an added role in ensuring the mass production of these types of vehicles in North America.

ISSUES

The report examines the following issues and identifies options for addressing each issue as follows:

ISSUE 2.1 - Incremental Cost of LEV's Operating On Gasoline

- *Option 2.1.1 - (Near Term, Status Quo) – No New Option Identified*

ISSUE 2.2 - Incremental Cost of LEV's Operating On Alternative Fuels

- *Option 2.2.1 (Medium Term, Complementary Action)*
  – New Incentives to Reduce Price Gap

ISSUE 2.3 – Reducing Regulatory Overlap & Costs

- *Option 2.3.1 (Near Term, Harmonization/Streamlining)*

– Harmonize with Subsequent Regulations

- *Option 2.3.2 (Medium Term, Harmonization/Streamlining)*

–Reduce Mandatory Reporting

ISSUE 2.4 - Repeal of This Regulation

- *Option 2.4.1 (Near Term, Status Quo) – No Amendments Required, or*
- *Option 2.4.2 (Medium Term, Harmonization/Streamlining)*

– Amend Regulation To Permit CanLEV MOU, or

- *Option 2.4.3 (Medium Term, Harmonization/Streamlining)*

– Amend Section 12 To Establish Minister's Prerogative to Repeal

ISSUE 2.1 - INCREMENTAL COST OF LEV'S OPERATING ON GASOLINE

Key Question – Are LEV's now being sold, and at what incremental price over vehicles which meet less stringent emission standards?

Discussion - During the public debate in both Canada and the United States on the issue of LEV's there was a wide divergence of estimates on the incremental cost of LEV's that would operate on gasoline. Vehicle manufacturers indicated that these costs could range as high as $1500 per vehicle. Both the California Air Resources Board and the U.S. Environmental Protection Agency studied the issue and concluded that the incremental average cost of a LEV vehicle would likely be in the order of US$70 - $150 under large manufacturing volume conditions. It should be noted that actual incremental costs will likely vary for each vehicle model with manufacturers internalizing these costs across some or all of their product lines.

The California, British Columbia and now NLEV regulations have established regulatory certainty for vehicle manufacturers that will enable them to volume produce LEV's. To date, three years in advance of the full scale introduction of LEV's, the incremental price of LEV's now being sold in California, or being sold with the same hardware in jurisdictions such as British Columbia, appears to be within or close to this range. As further evidence of the progress manufacturers have made in being able to supply LEV's at low incremental prices at least two manufacturers, Honda and Mazda, have now introduced in California vehicles that meet the ULEV standard which operate on gasoline and are priced competitively.

Option 2.1.1 (Near Term, Status Quo)
– No New Option Identified

The estimated average incremental cost of LEV's that operate on gasoline appears to be on target and in the order of $100 - $150/vehicle

Therefore, no action is suggested at this time.

ISSUE 2.2 - INCREMENTAL COST OF LEV'S OPERATING ON ALTERNATIVE FUELS

Key Question – Are LEV's that operate on alternative fuels now being sold, and at what incremental price over similar vehicles which operate on gasoline?

Discussion - Vehicle manufacturers currently offer for sale a limited number of alternative fueled vehicles that meet the LEV requirements. A number of models are available that are certified to ULEV standards which operate on natural gas and propane. The incremental price of these vehicles is still significant (on the order of $2000 - $7000/vehicle) resulting in buyer interest only by those who have been mandated to purchase such vehicles, or for whom the higher purchase costs can be balanced by lower operating costs.

It is noted that these vehicles bring other emission benefits beyond lower tailpipe emissions such as reduced evaporative emissions due to closed loop fuel systems and reduced greenhouse gas emissions. The Clean Technology Vehicle committee, which is mandated under Section 9 of this regulation, has indicated its concerns about the pricing barrier for alternative fueled vehicles. It is generally recognized that, unlike gasoline, the use of alternative fuels offers substantial promise in achieving extremely low emissions across a wide range of engines and reducing CO2 emissions by 15 – 20%/vehicle. A solution to the pricing barrier is needed in order to secure the benefits described above.

It should be noted that the province's luxury tax on new vehicles sold which have a price of $32,000 or more may have an impact on reducing the sales of some cleaner technology vehicles such as those which use natural gas.

Option 2.2.1 (Medium Term, Complementary Action)
– New Incentives to Reduce Price Gap

A number of incentives could be considered to reduce the price gap. Currently, some vehicle manufacturers offer incentives such as rebates for the purchase of alternative fueled vehicles. BC Gas has approval from the B.C. Utilities Commission to offer an incentive of $1000/vehicle towards the purchase of a natural gas fueled vehicle. This incentive can be topped up by a further $1000 if a purchaser also scraps an older high polluting vehicle under the province's SCRAP-IT program.

A number of other incentives are under consideration or should be reviewed including:

- The CTV committee's recommendation that reducing or eliminating the Provincial Sales Tax on ULEV vehicles using alternative fuels be examined
- The CTV committee's recommendation that the tax rate on alternative and renewable fuels under the Motor Fuel Tax Act be reviewed
- The Federal Government is also reviewing its incentive programs for such vehicles under the MDIP program.
- A review of the effect the luxury tax has on reducing sales of some cleaner technology vehicles.
- Non-cash incentives such as access to High Occupancy Lanes (HOV) by cleaner technology vehicles

Work needs to continue to examine how best to overcome the financial barrier to the purchase of such vehicles.

ISSUE 2.3 – REDUCING REGULATORY OVERLAP & COSTS

Key Question - Is this regulation administratively efficient in ensuring LEV's are sold in the province?

Discussion – Since this regulation was enacted both the Canadian Tier I regulation and the U.S. NLEV rules have taken effect. In addition, the Canadian Government has formally indicated via publication of a Gazette 1 notice its intention to enact a regulation requiring the sale of LEV vehicles by model year 2001. The British Columbia regulation currently only references the rules and standards required in the State of California. Vehicle manufacturers have stated that having a harmonized North American LEV standard ensures the lowest production cost for vehicles.

At the same time it was recognized that Canadian federal regulators have traditionally followed the U.S. EPA rules for emission standards and, as indicated in the Gazette 1 notice, will again follow this course. This will have the effect of reducing certification costs by allowing manufacturers to certify vehicles under the NLEV program and if the identical vehicle is sold in Canada, provide this information to Canadian authorities as evidence of compliance with Canadian regulations. An advantage of the NLEV rule being referenced in the British Columbia regulation is that, as discussed in Section 5 of this report, NLEV also offers a way to deal with the fuels issue that is not available under the California law.

When the British Columbia regulation was enacted a commitment was made to vehicle manufacturers that once vehicle emission regulations had the force of law in those other jurisdictions that these regulations would be referenced in the British Columbia regulation as appropriate.

At the same time an examination of the regulation reveals that the steps that a manufacturer must take to report evidence of compliance with the regulation appear reasonable given the need for the ministry to confirm that the regulation is being adhered to but that there may be opportunities to reduce the regulatory burden for manufacturers.

Option 2.3.1 (Near Term, Harmonization/Streamlining)
– Harmonize with Subsequent Regulations

The province committed to incorporate within this regulation references to the Canadian Tier 1 and NLEV regulations when those regulations took on regulatory certainty. As this is now the case the British Columbia regulation can be amended to give effect to this commitment while still retaining references to California. One issue that should be addressed in the near term is vehicle labeling. Currently, the regulation does not recognize model year 1998, 1999 or 2000 vehicles certified under the NLEV program to a LEV standard and labeled as meeting this emission standard.

In addition, a number of other amendments are needed to clarify some clauses or delete sections that are no longer applicable (like Section 7). A detailed list of the suggested amendments by section can be found in the Appendix to this report.

Option 2.3.2 (Near Term, Harmonization/Streamlining)
– Reduce Mandatory Reporting

Section 8(2) of the regulation requires manufacturers, commencing with the 1998 model year, to submit a report within six months of the end of a model year that indicates the number of passenger cars and light duty trucks sold in each model year, the NMOG fleet average, and details regarding any NMOG credits. Commencing with the 2001 model year a manufacturer must also provide within 30 days after the commencement of a model year a copy of the executive order from the California Air Resources Board that certifies vehicles to a particular LEV standard.

In order to reduce the regulatory burden for both manufacturers and the ministry this section of the regulation could be amended. It could be amended to no longer require that this reporting information be automatically submitted but that the ministry would be supplied such information upon request. Since the regulation requires that all vehicles be labeled the ministry will have a high level of assurance that the regulation was being complied with.

If there still is a need for the information to be submitted then an option could be to ease the burden on manufacturers by amending the regulation to require that an annual summary of vehicles sold by certification levels be provided either on an individual manufacturer or industry association basis.

ISSUE 2.4 - REPEAL ON FEDERAL REGULATION

Key Question – Should any changes be made to the repeal clause of the regulation?

Discussion – The British Columbia regulation anticipated that a Canadian LEV regulation would likely be enacted at some time in the future and, in this circumstance, the British Columbia regulation would be repealed. Section 12 of the regulation states that:

"If the Government of Canada enacts legislation, applicable to new passenger cars and light-duty trucks delivered and offered for sale in all the provinces and territories of Canada, that establishes fleet average NMOG values which are equal to or more stringent than the fleet average NMOG values set out in sections 1 and 2 of Schedule 1, this regulation is repealed on the day on which that legislation comes into force

The Canadian Government has now issued a draft regulation that would see a national Canadian LEV (CanLEV) program implemented on the same timetable as the U.S. NLEV program. As well, those manufacturers who are members of the Canadian Vehicle Manufacturers' Association offered to supply LEV's to the Canadian market on a similar basis as the NLEV program. This offer is currently being re-evaluated as a consequence of the July 1998 decision by the Government of Canada to withdraw its trade restriction on MMT.

Option 2.4.1 (Near Term, Status Quo) – No Amendments Required

The repeal clause is triggered if the Federal Government enacts a regulation that delivers a LEV program that has the same air quality benefits that will be delivered by the British Columbia regulation. Such an enactment would result in a single national regulation thereby reducing the administrative burden of this regulation for both manufacturers and the ministry.

A less stringent national regulation would not trigger the repeal clause.

Option 2.4.2 (Medium Term, Harmonization/Streamlining) – Amend Regulation To Permit CanLEV MOU

Historically, except for the recent Federal Government's Tier 1 regulation, vehicle manufacturers have made available vehicles in the Canadian market that meet certain emission standards under Memorandum of Understanding (MOU) agreements with Transport Canada. These agreements were seen as a lower cost way for both parties to satisfy their obligations while permitting greater flexibility on how the standards would be met. Although such agreements do not have the same status in law as a regulation these MOU's have been interpreted by the Canadian Government as legally binding and having the equivalent effect.

If Transport Canada were to proceed to implement a CanLEV program under an MOU, and the outcome of the MOU can be clearly demonstrated as having the same level of certainty as

under this regulation, then Section 12 of the regulation would either need to be amended to accommodate this outcome or the regulation could be repealed by way of a provincial Cabinet decision. Preliminary legal advice suggests that it would be difficult to amend the repeal clause to allow an MOU to trigger the repeal. The next option is therefore suggested as a possible alternative

Option 2.4.3 (Next Year, Harmonization/Streamlining)
– Amend Section 12 To Establish Minister's Right to Repeal or Suspend Some or All of Regulation Based on Review Process

An advantage of amending the regulation to provide the minister with the right to repeal or suspend some or all of the regulation is that this enhances the flexibility of the ministry to respond to a Canadian Government MOU or different vehicle emission issues as they arise.

Where the regulation is redundant these clauses can be repealed. Where there may be certainty on an issue in only the short term, parts of the regulation could be suspended for this term. An example is the proposed Canadian Government's CanLEV program where all the provisions of the British Columbia regulation could be suspended for the period in which the NMOG schedules are the same (currently model years 2001 - 2004), except for the CTV related sections. Then, if the Canadian Government's NMOG schedule for model year 2005 and later was less stringent than that required in British Columbia the Minister could lift the suspension thereby requiring that the province's NMOG schedule be met.

3. REVIEW CRITERIA - Effectiveness Of Regulation In Meeting Air Quality Objectives

BACKGROUND

Transportation As A Key Source of Emissions

A purpose of this regulation is to ensure that the best available lowest emission vehicles are sold in the province in order to reduce air pollution, especially in the Lower Fraser Valley. Air pollution has a significant cost and there are important benefits to be achieved from improving air quality across the province.

The largest single source of air pollution in major population centres like the Okanagan Valley, the eastern side of Vancouver Island and the Lower Mainland is transportation. In the Greater Vancouver Regional District (GVRD) studies show motor vehicles emit more than 75 percent of air pollutants in the region. By 2021, the number of vehicles in the GVRD, and the total distance driven by these vehicles, is expected to double. This is expected to result in increased total emissions despite the sale of low emission vehicles as required under this regulation.

Changing Context of Air Quality Objectives

Public policy responses to air quality issues are a function of an assessment of the need to act. This need has been driven by a number of key factors including the establishment of air quality standards, measurement, forecasting and planning. All of these factors have proven to be subject to change over time as new information becomes available, measurement methods improve, computer forecasting models are refined, and public values change in support of more extensive air pollution mitigation measures.

Since this regulation was created in 1995, a number of the factors identified above have changed. Greenhouse gases have emerged even more strongly as an issue with international movement toward binding targets (this issue is discussed further in Section 6 of this report). As well, evidence on the health effects of fine particles has continued to mount, with an increasing consensus that the finest particles are most significant. These particles are often formed from chemical reactions between pollutant gases such as those contained in tailpipe emissions.

Canada-wide standards are in the process of being set for both PM (particulate matter) and Ozone, which may result in the need for the province to achieve greater emission reductions in future years. At the same time new computer models are being developed for PM and Ozone and a new Mobile 6 emissions forecasting model has been developed by the U.S. Environmental Protection Agency that will change the future forecasts for fleet emissions in British Columbia. These models will improve the understanding of these issues and their use may suggest that new air pollution reduction strategies be implemented.

A major factor in reducing emissions from all sources in the Lower Mainland has been the implementation of measures under the GVRD/FVRD Air Quality Management Plans. These

plans will be updated in the next two years reflecting the latest data and modeling plus changes to regional growth forecasts. As a result there may be new recommendations forthcoming with respect to vehicle emission standards and fuels.

Costs of Poor Air Quality

A number of studies conducted for the Air Quality Management Plans have concluded that air pollution has significant costs, and only some of these costs are readily quantifiable. Health impacts of poor air quality range from irritation of the eyes, nose and respiratory tract to more serious problems such as impaired lung function, decreased resistance to infection, increased incidence and severity of asthmatic attacks, and premature death mainly due to respiratory and heart conditions. Many of these effects are associated with find particle inhalation. Air pollution has other costs as it reduces crop yields, damages forests and other vegetation, destroys building materials, and impairs visibility.

Estimating the benefits of improving air quality is a difficult task since many of the benefits are in the form of reduced impacts on human health. Numerous studies of air quality issues have estimated the benefits and consistently concluded that these benefits are significant. In the case of the GVRD, studies have concluded that improving air quality in the Greater Vancouver Regional District is expected to:

- save 2,800 lives,
- prevent 33,000 hospital emergency room visits,
- prevent $74 million in crop damage, and
- result in a $1.6 billion benefit to the provincial economy to Year 2020.

Studies have shown that the introduction of low emission vehicles will have a significant impact on improving air quality in the next century. Their exact contribution to reducing the impacts identified above is more difficult to quantify.

ISSUES

The report examines the following issues and identifies options for addressing each issue as follows:

ISSUE 3.1 - Effectiveness in Targeting Key Air Quality Issues

- *Option 3.1 - (Near Term, Status Quo) – No Amendment Required for ozone or fine particulate effectiveness; see section 6 for discussion of greenhouse gases*

ISSUE 3.2 –Regulation's Affect on Emission Performance of LEV's

- *Option 3.2 (Near Term, Status Quo) – No Amendment Required*

ISSUE 3.3 - Regulation's Influence On Achieving Air Quality Goals

- *See section 4 and section 6 for future options*

ISSUE 3.1 - EFFECTIVENESS IN TARGETTING KEY AIR QUALITY ISSUES

Key Question - does the regulation target key air quality contaminants from transportation, and is it effective in doing so?

Discussion - Key air quality issues for British Columbia include greenhouse gases, fine particulates and ground level ozone. In urban areas, transportation is a key contributor to all three issues. The regulation includes explicit standards for nitrogen oxides, hydrocarbons and carbon monoxide. It also refers to the importance of reducing greenhouse gases.

Hydrocarbons and nitrogen oxides

Both contaminants contribute to ground level ozone formation, and to the formation of secondary fine particles. Based on regional air quality modeling, an improved understanding of their relative contributions is expected over the next few years. Preliminary information suggests that the strong focus on hydrocarbon controls (in the form of Non-methane Organic Gases (NMOG)) may be more appropriate in California than in the Lower Fraser Valley. Emerging LEV II standards may provide additional opportunities to target NOx more effectively.

Fine particles

Direct emissions of particles from light duty gasoline vehicles are small. However, as identified above, NOx and NMOG reductions will reduce fine particle precursors. Other than a more rapid adoption of LEV standards, no emission standards are currently available in another jurisdiction which would further reduce these pollutants at this time.

Greenhouse Gases:
The regulation does not focus directly on greenhouse gases. To the extent that natural gas and propane CTV's are introduced, some greenhouse gas reductions are being realized, but these are relatively minor. At this time, few hybrid electric vehicles (HEV's) or Zero Emission Vehicles (ZEV's) are being sold, although a hybrid Toyota model (the Prius) is anticipated for Canadian sale in the 2000 model year. Gasoline LEV's (including several ULEV models) although effective in reducing NMOG emissions, have no impact in reducing greenhouse gases. Opportunities for targeting this regulation and the work of the CTV committee more effectively on greenhouse gases are discussed further in section 6 of this report.

Carbon Monoxide
Emerging information suggests that, in common with some other pollutants, carbon monoxide may have health effects at lower levels than previously understood. Its inclusion in the regulation can therefore be regarded as precautionary.

The regulation is keyed on the pollutants of concern, and additionally targets carbon monoxide.

Option 3.1 (Near Term, Status Quo)
– No Amendment Required for Ozone or Fine Particulate Effectiveness
As the regulation appears to target as effectively as possible precursors to ozone and fine particulates, no changes are suggested at this time. The proposal for further reductions through the next generation California LEV II standards is noted. The Canadian Government's adoption of the United States standards for Heavy Duty vehicles primarily operating on diesel engines is well targetted on fine particulate emissions as is British Columbia's in use emissions testing program for such vehicles.

See section 6 for a discussion of options more effective in targeting greenhouse gases.

ISSUE 3.2 – REGULATION'S EFFECT ON EMISSION PERFORMANCE OF NEW VEHICLES

Key Question - does this regulation enhance or impede in any way the ability of new vehicles to deliver air quality benefits?

Discussion - One purpose of the regulation is to ensure that LEV's achieve air quality goals by operating at the standard to which they were designed. The regulation clearly sets out the definition of what constitutes LEV's and the numbers to be sold by year based on an NMOG fleet average as set out in Schedule 1 of the regulation.

With respect to the actual performance of LEV's their emissions performance may be negatively affected to some degree by two factors, namely, the quality of vehicle maintenance and quality of the fuel available in the province to be used by these vehicles. In the case of the first factor,

the advent of the On-Board Diagnostic Second Generation (OBD-2) Emission Control Systems has reduced the risk that LEV vehicles will operate outside their emission design parameters. As well, OBD-2 systems provide feedback to motorists when this is not the case thereby encouraging and facilitating early repair.

This is especially the case in the Lower Mainland where vehicles are subject to an annual emissions inspection under the AirCare program. If the OBD-2 indicator lights are triggered AirCare automatically fails the vehicle thereby ensuring that the vehicle is repaired. Under British *Columbia's Emission Warranty Regulation* motor vehicle manufacturers are obligated to repair any vehicle which does not perform to its emission design standard. The combination of AirCare, OBD-2 and the *Emission Warranty Regulation* results in a high level of assurance that vehicles will be properly maintained and air quality goals met.

However, both the use of higher sulphur gasoline and MMT may affect the operation of OBD-2 systems resulting in both higher emissions and AirCare fail rates. The fuels issue and options for action are reviewed in detail in Section 5 of this report.

Option 3.2 (Near Term, Status Quo)
– No Amendment Required

Under the Regulation LEV's are required to be sold in the province to address air quality objectives. OBD-2 systems are required under the Regulation to be incorporated into each LEV, British Columbia's *Emission Warranty Regulation* is in effect and the AirCare program ensures that vehicles conform to their emission standard. These three factors minimize the risk of new vehicles not consistently operating at their emission design parameters.

Options regarding the role of fuels in ensuring emission performance are discussed in Section 5 of this report.

ISSUE 3.3 - REGULATION'S INFLUENCE ON ACHIEVING AIR QUALITY GOALS

Key Question - does this regulation need to be amended to adopt more stringent tailpipe emission standards in response to forecast air quality problems?

Discussion – This is a common issue to jurisdictions that are experiencing air quality problems and which are examining the opportunities and benefits of regulating emissions from vehicles. A common approach has been to adopt vehicle emission standards from other jurisdictions. Section 4 of this report examines this issue in some detail in the context of actions taken by other jurisdictions to address the same problem. Section 6 deals with greenhouse gas reduction options.

4. REVIEW CRITERIA - Consistency Of Regulation Compared To Other Jurisdictions

BACKGROUND

California's air quality problems, caused principally by automobiles, have historically not been in compliance with air quality standards as required by the U.S. Clean Air Act. If these air quality issues were not addressed by that state there would not only be serious public health implications but this situation would also result in significant penalties to California under the Clean Air Act. This circumstance has been the basis of that state's on-going proactive measures for over two decades to develop and enact regulations that require lower emissions from vehicles. This work culminated with the establishment of the LEV program.

Subsequently, other North American jurisdictions followed California's lead and as of November 1998 there were six jurisdictions that had enacted regulations requiring the sale of LEV's that satisfy a NMOG fleet average. These jurisdictions include the U.S. states of California, New York, Massachusetts, Vermont, the U.S. Environmental Protection Agency's National Low Emission Program (NLEV), and British Columbia.

While LEV vehicles underpin the regulations in each of these jurisdictions there are differences across jurisdictions related to NMOG schedules, ZEV requirements, fuels issues and greenhouse gas objectives.

The British Columbia regulation requires that LEV vehicles be sold in the province starting in 2001. The Canadian automobile industry's position is that Canadian and British Columbia's emission standards should be "harmonized" with that of the recently enacted U.S. National Low Emission Program (NLEV). In this regard vehicle manufacturers made a formal offer to the Government of Canada earlier this year to sell vehicles in Canada that meet the emission requirements of the NLEV program beginning model year 2001.

The purpose of this section of the report is to identify the differences in regulations across the jurisdictions, assess the importance of these differences, and outline options for possible action to address these differences.

ISSUES

The report examines the following issue and identifies options for addressing the issue as follows:

ISSUE 4.1 – Regulatory Consistency Across Jurisdictions

- *Option 4.1.1 (Near Term, Status Quo) – No Amendments Required*
- *Option 4.1.2 (Medium Term, Harmonization/Streamlining)*

– Amend Section 12 To Establish Minister's Prerogative to Repeal

- *Option 4.1.3 (Medium Term, Harmonization/Streamlining)*

– Adopt NLEV NMOG Schedule

- *Option 4.1.4 (Medium Term, Renewed Leadership)*
  - Adopt California's NMOG Schedule
- *OPTION 4.1.5 (Medium Term, Harmonization/Streamlining)*
  – Amend Small Volume Manufacturer Exemption

ISSUE 4.1 – REGULATORY CONSISTENCY ACROSS JURISDICTIONS

Key Question –are there differences in LEV regulations across jurisdictions and how important are these differences?

Discussion - Table 4.1 indicates the British Columbia Regulation is not completely identical to the NMOG fleet average regulations in California or under the NLEV program. As well, there are a number of other differences related to in-use certification requirements and fuels issues.

Model year pre-2001

For the pre-2001 model years British Columbia requires Tier 1 emission standards but has no NMOG fleet average requirements for either cars or trucks. In this same period both California and the NLEV program have applied NMOG fleet average requirements for several years in advance of model year 2001. The philosophy underlying British Columbia's regulation has been to permit manufacturers selling LEV's in other jurisdictions to achieve volume production and introduce these vehicles on their own timetable in the province up to model year 2001. As well, the province would provide NMOG credits for manufacturers who sell such vehicles in advance of 2001. At the same time, the province has focused on trying to achieve sales targets through Schedule 2 of the regulation for more advanced vehicles in this same period.

Model year 2001 - 2004

For model years 2001 – 2004 the NMOG schedule for British Columbia is identical to that of the NLEV program and the Canadian proposed CanLEV program, while the NMOG fleet average is more stringent in California. The difference is not large and reflects a different model mix during this period in response to the ZEV mandate in that state.

ZEV Sales Mandate in California

California amended its approach requiring the sale of zero emission vehicles starting in 1998. That state negotiated a more gradual introduction of this technology which culminated in a

contractual commitment by vehicle manufacturers to sell 10 percent of all new vehicles as zero emission vehicles (ZEV's) by model year 2003.

The California NMOG average reflects the ZEV sales requirement. If manufacturers fail to meet this sales requirement they will be subject to financial penalties imposed by that state. The adoption of a ZEV sales requirement has been controversial and any action by British Columbia to adopt the California NMOG number would be viewed as establishing a de facto ZEV sales mandate requirement and likely would not be supported by manufacturers.

While the British Columbia regulation has no ZEV sales requirement it does have a sales target that by model year 2003 10% of new vehicles sold in the province should be cleaner technology vehicles defined by the regulation as meeting ULEV, HEV or ZEV emission standards. The Clean Technology Vehicle committee has been established to promote these types of vehicles but only a small percentage of the vehicles sold to date meet those requirements. The vast majority of advanced vehicles that have been sold in British Columbia for the 1998 model year are ones that use emission control hardware that is certified to LEV standards in California and to the Tier I standard in Canada.

Model year 2004 & Beyond

As the Table 4.1 shows NLEV has not yet addressed the issue of an NMOG standard for the 2004 model year and later although the U.S. Environmental Protection Agency has indicated that it plans to propose more stringent car and truck emissions standards to take effect in 2004 or beyond.

LEV II Standards

California has recently proposed a new series of emission standards for cars and trucks known as LEV II that would take effect starting in model year 2004. These LEV II standards, which are much more stringent than British Columbia's requirements, would see up to a further 50% reduction in tailpipe emissions from British Columbia's NMOG standard.

As well, California is proposing to establish a new emissions certification category called Super Ultra Low Emission Vehicle (SULEV) for fuel cell and hybrid electric vehicles that would be factored into that state's NMOG fleet average. In addition, California's new standards would include a new, zero or almost zero evaporative standard, a zero refueling emission requirement and incorporate new tailpipe emission standards for NOx.

Vehicle manufacturers have expressed concern that British Columbia's schedule is not consistent with these other jurisdictions for the 2004 model year and later and that the province should follow the lead of any standards as set forth by the NLEV program and not California's.

Trucks

There is another significant aspect of the California LEV II proposals that is not currently incorporated into the British Columbia regulation. That is, the LEV II standards will significantly

reduce the emissions from light duty trucks to the same level as that of cars. California is proposing to incorporate into its definition of light duty vehicles trucks such as mini-vans and sport utility vehicles (SUV's).

Small Volume Manufacturer Exemption

There is also a difference of views among vehicle manufacturers with respect to Part 1, Section 2 (1)(d) that exempts small volume manufacturers from the regulation. The purpose of this clause was to follow California's approach whereby consumer choice would not be restricted by permitting extremely small volume manufacturers to continue to sell their vehicles in the province. At the same time the almost "one off" sales would have an insignificant impact on air quality if that manufacturer could not meet the LEV standards.

California's regulation exempts any manufacturer that sells fewer than 3000 vehicles a year in that state (4500 beginning model year 2001) while the British Columbia regulation is more restrictive as it only exempts a manufacturer who sells less than 100 vehicles anywhere in the world. Some manufacturers have suggested British Columbia should parallel the California requirement while others are of the view that this is a competitiveness issue and therefore no special treatment should be accorded small volume manufacturers

Option 4.1.1 (Near Term, Status Quo)
– No Amendments Required

The British Columbia regulation is not completely consistent with the NMOG fleet average schedules in either California or under the NLEV program. This is the case as the regulation was designed to allow some flexibility in how manufacturers could make the transition from Tier 1 to LEV standards over the period 1998 to 2001. For the 2001 – 2004 model years the British Columbia regulation is consistent with NLEV but is less stringent than California's. The differences are small and reflect, for the most part, the California requirement for the sale of ZEV's. For the period beyond 2004 there are still regulatory uncertainties on both future vehicle emission standards and fleet average NMOG in both California and under the NLEV program.

Table 4.1
NMOG Fleet Average Requirements by Model Year

Jurisdiction/vehicle	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Canada Tier 1										
Car/LDT to 3750 lbs.	.250 ⇒									
LDT 3751 to 5750 lbs.	.320 ⇒									
CanLEV (proposed)										
Car/LDT to 3750 lbs.				.075 ⇒						
LDT 3751 to 5750 lbs.				.100 ⇒						
British Columbia										
Car/LDT to 3750 lbs.	.250 *	.250 *	.125 *	.075 ⇒				.070⇒		
LDT 3751 to 5750 lbs.	.320 *	.320 *	.160 *	.100 ⇒				.098⇒		
California	**LEV**						**LEV II**			
Car/LDT to 3750 lbs.	.157	.113	.073	.070	.068	.062	.053 proposed	.049 proposed	.046 proposed	.043 proposed
LDT 3751 to 5750 lbs.	.205	.150	.099	.098	.095	.093	.085 proposed	.076 proposed	.062 proposed	.055 proposed
NLEV										
Car/LDT to 3750 lbs.		.148	.095	.075 ⇒			?			
LDT 3751 to 5750 lbs.		.190	.124	.100 ⇒			?			

- Not a regulated standard but used as a basis for calculating NMOG credits

Option 4.1.2 (Medium Term, Harmonization/Streamlining) – Amend Section 12 To Establish Minister's Right to Repeal or Suspend Some or All of Regulation Based On Review Process

The regulation could amend Section 12 which calls for the regulation to be automatically repealed as soon as there is a Canadian regulation that requires the equivalent to Schedule 1 of the regulation. The repeal is based on an assumption that the Canadian Government will closely follow the NLEV regulation. The historic position of the manufacturers has been that those vehicles that meet the national emission standards in the U.S., and not those of California, would be supplied to Canadian consumers. Currently, this is the case where vehicles meeting the Tier 1 emission standard are sold in both Canada and the United States. But, given the current uncertainties regarding future emission standards in model year 2004 or beyond, there is a possibility that there might be important differences between the California and NLEV rules. If British Columbia wants to retain its flexibility to address air quality concerns by adopting some or all of California's future standards it might not be possible to readily do so if this regulation had been repealed.

Option 4.1.3 (Medium Term, Harmonization/Streamlining)
– Adopt NLEV NMOG Schedule

If the province adopted the NLEV NMOG fleet average for the 1999 or 2000 model year this would be a significant departure from the product timetables as understood by manufacturers. 1999 model year vehicles are already being sold in the province so the adoption of this option would only affect model year 2000 vehicles. It is also the case that the production design schedules and LEV vehicle roll outs by market area are far advanced for model year 2000 vehicles making the application of this option problematic. Under this option model vehicle availability in the province might be affected if a manufacturer's NMOG fleet average could not be met by the existing mix of models planned for sale for the year 2000 model year.

As well, Canadian vehicle manufacturers would also face a problem that is not yet resolved. That is, they would need to commit to the in-use certification requirements of an NLEV car in the absence of a resolution of the fuels issue in Canada (see Section 5 for a full discussion of this issue). Finally, the British Columbia regulation specifies an NMOG fleet average standard for the 2005 model year that is more stringent than the 2001 requirement while the NLEV rule hasn't yet set a requirement for the 2005 model year. If British Columbia rescinded the existing 2005 NMOG number this would likely be seen by the public as a regressive step.

A viable option may be for the province to accept the offer from vehicle manufacturers to supply LEV's to Canada beginning 2001 and adopt the NMOG schedule just for the model years 2001 – 2003.

Option 4.1.4 (Medium Term, Renewed Leadership)
– Adopt California's NMOG Schedule

Adopting the California NMOG schedule would bring cleaner vehicles to the province sooner than the approach adopted by the regulation. There are several challenges over the short term that would need to be resolved first. ZEV's are a contentious issue and innovative but unproven ZEV technology is only at the early stages of being introduced to consumers in California. Manufacturers want to minimize the technical and consumer risks by piloting ZEV's in a more limited market like California before selling these vehicles in other areas.

The fuels issue will also need to be addressed. The position of vehicle manufacturers is that more stringent NMOG averages will not deliver fewer emissions when the gasoline used results in vehicles that may not be able to operate in compliance with LEV standards and therefore would be unable to meet the British Columbia NMOG in Schedule 1.

Option 4.1.5 (Medium Term, Harmonization/Streamlining)
– Amend Small Volume Manufacturer Exemption

California currently exempts a manufacturer from its regulations if that manufacturer sells less than 3000 vehicles /year in that state. British Columbia's exemption is only for those

manufacturers who sell more than 100 vehicles/year in the world. There are a few smaller vehicle suppliers to the province who would like to see British Columbia establish an equivalency to the California regulation. As the California market is about ten times the size of British Columbia's that would mean that the regulation could be amended to reference an exemption trigger number of 300 vehicles sold/year in the province. This option requires further study.

5. REVIEW CRITERIA – Technological Changes And Fuel Compatibility

BACKGROUND

The internal combustion engine has evolved since being first used in vehicles early this century. Manufacturers have modified engine designs and added technologies such as electronic engine controls and catalytic converters to both improve performance and lower tailpipe emissions. This added sophistication has meant that engines and their emission control systems must operate within a very narrow range of emission performance tolerance in order to remain in compliance with regulated standards.

The introduction of LEV standards has meant that the tolerance range has narrowed considerably and the role of fuels used by these engines becomes much more critical in achieving required emission performance. Recently, the issues of sulphur levels in gasoline and the fuel additive MMT have become a matter of concern and debate. Vehicle manufacturers have consistently stated that in order for LEV's to operate at their design standard these vehicles must use high quality MMT free gasoline, which also meets the California sulphur standard. Sulphur levels above 30 ppm average have been shown to adversely affect emissions performance.

California's recent proposal to introduce its next generation LEV II standards has been accompanied by proposals to also introduce stricter future standards for gasoline and diesel fuels. These new fuel standards may be needed not only to reduce emissions from internal combustion engines but also to meet the technical requirements of new engine technologies such as the Ballard Fuel Cell operating on gasoline. In the longer term LEV II standards may result in sulphur levels as low as 10 – 30 PPM to fuel conventional engines and the creation of niche market gasoline products which have specialized characteristics such as zero sulphur content for new technology vehicles.

ISSUES

The report examines the following issues and identifies options for addressing each issue as follows:

ISSUE 5.1 – Sulphur Levels In Gasoline

- *Option 5.1.1 (Near Term, Status Quo) – No Amendments Required, or*
- *Option 5.1.2 (Medium Term, Harmonization/Streamlining) –Adopt NELV "off ramps",*
- *Option 5.1.3 (Medium Term, Relax BC Requirements) –Exclude In-Use Requirements,*
- *Option 5.1.4 (Medium Term, Relax BC Requirements) – Amend Emission Warranty Regulation,*
- *Option 5.1.5 (Medium Term, Relax BC Requirements) – Amend AirCare Test Procedures*

ISSUE 5.2 – MMT In British Columbia Gasoline

- *Option 5.2.1 (Near to Medium Term, Status Quo) – No Amendment Required*
- *Option 5.2.2 (Near to Medium Term, Renewed Leadership) – Restrict Sale of MMT,*
- *Option 5.2.3 (Near to Medium Term, Renewed Leadership) –Pump Labeling of Gasoline Sold With MMT*
- *Option 5.2.4(Medium Term, Harmonization/Streamlining) –Adopt NLEV "off ramps"*
- *Option 5.2.5 (Medium Term, Relax BC Requirements) –Exclude In-Use Requirements,*
- *Option 5.2.6 (Medium Term, Relax BC Requirements) – Amend Emission Warranty Regulation,*
- *Option 5.27 (Medium Term, Relax BC Requirements) – Amend AirCare Test Procedures,*

ISSUE 5.3 – Future Fuel Quality

- *Option 5.3.1 (Longer Term, Renewed Leadership) – Tracking of Issues*

ISSUE 5.1 – SULPHUR LEVELS IN GASOLINE

Key Question – What are the differences in sulphur levels in gasoline across jurisdictions and how important are these differences with respect to the operation of LEV's?

Discussion - This issue of the impact different levels of sulphur have on vehicle emissions has been the subject of extensive research in both the Canada and the United States. In California, sulphur in gasoline is currently not an issue as that state has mandated a stringent sulphur content standard of 30 PPM (parts per million) average, 80 PPM maximum. This contrasts to the current Canadian average sulphur content that is ten times higher at over 300 PPM.

Lower Sulphur Levels In British Columbia Gasoline

In British Columbia, the province examined this issue and concluded that action was needed to reduce sulphur levels for both air quality and engine performance reasons. As a consequence,

in December 1995 the Clean Gasoline Regulation was enacted which sets an annual average gasoline sulphur limit of 150 PPM for the Lower Mainland and Vancouver Island (January 1, 1999) and 200 PPM for the rest of the province (January 1, 2000). This gasoline will have an average sulphur level about equivalent to that of the U.S. EPA's reformulated gasoline sold in those areas outside of California that have severe air quality problems. Using an alternative computer model approach, refiners are allowed to produce gasoline of higher sulphur levels if the predicted tailpipe emissions are less than those calculated using a baseline gasoline with 150/200 PPM sulphur as appropriate. The approach allows refiners to take credit for reductions in tailpipe emissions caused by blending gasoline which have lower than average levels of parameters other than sulphur.

CCME Sulphur In Gasoline Study
A major Canadian effort to examine this issue was a report completed in July 1997 by a CCME Vehicle/Fuel Compatibility Task Group. This report concluded that sulphur in gasoline:

- reduces catalytic converter efficiency(the higher the sulphur level, the greater the reduction in efficiency), and

- may impair O2 sensor and OBD -2 system performance.

The study also concluded that the magnitude of these effects is uncertain and variable across different engine types and manufacturers.

Proposed Canadian Government Sulphur Regulation
On October 23, 1998 the Canadian Government announced its proposed regulations for sulphur content of gasoline. Effective January 1, 2002 the sulphur content of all gasoline sold in Canada will be lowered to 150 PPM average, 200 PPM maximum. This will be followed by a further reduction to 30 PPM average, 80 PPM maximum effective January 1, 2005. Concurrently, the U.S. EPA has been studying the sulphur issue in the context of the NLEV program and future Tier 2 vehicle emission standards. It is anticipated that EPA's proposed national gasoline sulphur standard for the United States will be released by mid-1999.

Now that the Canadian Government has issued its draft regulation requiring the sale of 30 PPM sulphur gasoline beginning in 2005 the issue of ensuring compatibility between LEV vehicles and low sulphur gasoline is resolved for vehicles sold as of that date.

In the interim, the question remains of whether LEV's that are required to be sold in British Columbia will be able to meet the requirements of the regulation when operating on 150 PPM sulphur gasoline during the period 2001 – 2005.

Differences Between Proposed Canadian Government & B.C. Sulphur Regulations
There are some minor but important differences between British Columbia's regulation and the one proposed by the Canadian Government. The provincial regulation follows the approach of

the U.S. EPA and CARB by offering added flexibility to refiners in how they achieve the regulated sulphur standard. Refiners selling gasoline in the province are allowed to produce gasoline of higher sulphur levels than permitted by the proposed Canadian Government regulation for 2002 if they use the previously described model-based approach. The net effect of this difference is that under the B.C. regulation refiners are producing gasoline with an average sulphur level approximately 50 PPM higher than the numerical limit. If this effect continues, refiners would be able to comply with the B.C. Cleaner Gasoline Regulation 1999 Lower Fraser Valley 150 PPM standard with gasoline having a sulphur level of about 200 PPM. They will quite likely have to invest in further processing equipment to meet a 150 PPM Canadian Government requirement in 2002 but with very little, if any, incremental improvement in tailpipe emissions beyond what is required under the B.C. regulation.

Refiners made substantial investments in response to the British Columbia regulation three years in advance of knowing the details of the proposed Canadian regulation and some of these refiners may now be competitively and financially disadvantaged by these regulatory differences.

NLEV Approach To Sulphur In Gasoline Issue

In the United States, the U.S. EPA has taken the position as part of its NLEV program that automobile manufacturers will be permitted a regulatory "off-ramp" related to the potential effects of sulphur levels on the emissions performance of NLEV vehicles. Manufacturers will be able to apply to exempt a model from the NLEV program if it can be shown that a particular vehicle cannot meet the LEV in-use certification requirements due to the use of higher sulphur gasoline. This policy will be applied on an individual model, case by case, basis.

For Canada, the Canadian Government has indicated that it will move forward to adopt the NLEV program and that Canada will adopt the same approach to the sulphur issue as the EPA in which "off ramps" would be permitted on a case by case basis.

In British Columbia, the regulation references the California LEV rules which do not permit any "off ramp" due to fuel issues. This process is not needed in that state due to the existing requirements for low sulphur gasoline. This means that while British Columbia's regulation requires California LEV's the province's sulphur limits are almost identical to that of the U.S. EPA's reformulated gasoline. But, unlike the NLEV program, the British Columbia regulation currently does not permit any "off ramps".

Sulphur and Emission Warranty Issues

Manufacturers remain concerned that there is a risk of an emission warranty costs to selling in British Columbia LEV certified models if these models cannot operate in compliance with emission standards due to the sulphur issue. As well, there is a similar risk to them if the OBD-2 indicator lights trigger resulting in an automatic fail at AirCare stations and repairs that have to be paid for by manufacturers as required under British Columbia's emission warranty regulation.

Future Sulphur Levels In California

The current debate has focused on the linkage between LEV vehicles and the need for California sulphur standards to enable LEV's to operate at their design standard. Discussions in California are already moving forward to discuss the maximum sulphur levels that will be permitted under the proposed LEV II program and for new technologies such as fuel cells that operate on gasoline. At the same time the world's largest vehicle manufacturers have proposed a fuels charter which describes this industry's views on what types of fuels are needed to enable different emission technologies to operate at their emission standards. Sulphur levels ranging from zero to 30 PPM maximum have been put forward. This suggests that the issue of sulphur in gasoline will continue to be subject to future discussions.

Option 5.1.1 (Near Term, Status Quo)
– No Amendments Required

The British Columbia regulation does not permit any "off ramps" for reasons such as higher sulphur content of gasoline. The NLEV program will be working with manufacturers to fully assess which vehicle/engine families will need off ramps, if any. Once this situation has been clarified the province can determine its position at that time and determine if any changes are needed to this regulation.

At the same time British Columbia has commenced discussions with the Canadian Government with respect to the issue of regulatory differences on the sulphur standard issue. British Columbia has enacted a sulphur standard for gasoline three years in advance of a slightly different Canadian regulation. This difference is not likely to result in significant differences in the emission performance of LEV vehicles but will impact refiners who have made investments in response to the B.C. regulation.

Option 5.1.2 (Medium Term, Harmonization/Streamlining)
– Adopt NLEV "Off Ramps"

The NLEV program has many key similarities to the British Columbia regulation, namely, both require the sale of LEV's and the same NMOG fleet average in the same period, and these vehicles will be using gasoline with sulphur levels higher than the California standard. The province can accommodate the concerns of manufacturers the same way the U.S. EPA has on the sulphur issue by including in its definition of LEV's the NLEV definition. This will automatically extend the "off ramps" provision to manufacturers permitting them flexibility on this issue until California sulphur gasoline is sold starting in 2005. To the extent that there are vehicles sold in Canada that are not certified under the NLEV program there will need to be an agreement between the Ministry and manufacturers on technical assessments and approval procedures.

Option 5.1.3 (Medium Term, Relax BC Requirements)
–Exclude In-Use Requirements

The definitions of LEV's in both the California and NLEV rules include requirements that vehicles must be certified to the standards and must also meet in-use emissions requirements. The key concern of manufacturers has been that while they can certify their vehicles on California gasoline they cannot guarantee these vehicles will meet the in-use requirements of the California or NLEV rule without California gasoline. A way to deal with this issue is for the regulation to simply exempt manufacturers from this provision of both the California and NLEV regulation for the period up to January 1, 2005.

Option 5.1.4 (Medium Term, Relax BC Requirements)
– Amend Emission Warranty Regulation

The use of higher sulphur fuels may result in OBD-2 systems triggering red warning lights on dashboards and an automatic fail during AirCare testing. The Emission Warranty Regulation could be amended to permit vehicle manufacturers an exemption from the requirement to repair a particular model of vehicle if it can be demonstrated that the cause of the failure was sulphur in gasoline.

Option 5.1.5 (Medium Term, Relax BC Requirements)
– Amend AirCare Test Procedures

The use of higher sulphur fuels may result in OBD-2 systems triggering red warning lights on dashboards and/or a higher emission readings during an AirCare test of a LEV vehicle. AirCare test procedures could be amended so that model year 2001 - 2004 LEV's could be exempted from an automatic fail.

ISSUE 5.2 – MMT IN BRITISH COLUMBIA GASOLINE

Key Question – Is MMT being used in gasoline sold in British Columbia and how important is its use with respect to the operation of LEV's?

Discussion - The use by Canadian refiners of the low cost octane enhancer MMT (methylcyclopentadienyl manganese tricarbonyl has been controversial. MMT in gasoline is converted to manganese oxide when combusted. Most of the manganese oxides (about 60 - 80 percent) are deposited in the engine and exhaust system and the balance emitted to the atmosphere. Unfortunately, there is conflicting data with respect to the effect this deposition of MMT oxides has on the functioning of emission components, and the resulting level of emissions.

Canadian Government Regulatory Action

In June 1997, the Federal Government enacted the *Manganese-based Fuel Additives Act* that prohibited the importation and inter-provincial trade of MMT on the basis that the use of this additive would be detrimental to the emissions performance of new vehicles. On July 20, 1998

the Canadian government rescinded this legislation and refiners were again free to add MMT to gasoline. MMT is now being added to almost all gasoline sold in British Columbia.

The Government of Canada's latest position on this issue is that current scientific information does not demonstrate that MMT impairs the proper functioning of OBD-2 systems. As well, the United States Environmental Protection Agency has stated in the past that MMT does not cause or contribute to the failure of any emission control system based on an analysis of the Tier 0 and Tier 1 emission standards. The positions of these two regulators is contrary to that of vehicle manufacturers who state that MMT coats critical emission control components and this results in vehicles not being able to comply with emission standards such as that of the British Columbia regulation.

United States Regulatory Actions

The California Air Resources Board has strongly opposed the use of MMT on the basis of public health concerns and MMT is not permitted for use in that state. As a result, the MMT issue has not been a factor in the discussions in that state on the emission performance of LEV's. As well, in those areas of the United States that are required to use low sulphur reformulated gasoline the U.S. Environmental Protection Agency does not permit MMT to be added to that gasoline. Although MMT is permitted for use elsewhere in the United States very few refiners are using it.

Fuel Supplier Views

The position of Canadian refiners and the supplier of MMT, Ethyl Corporation, has been that there is no compelling scientific evidence to show that MMT has negative effects on automobile emission control systems or tailpipe emissions. Ethyl has conducted studies in support of this position and these studies have been accepted by the Government of Canada as indicated in its statement of July 20, 1998 that, "the current scientific information fails to demonstrate that MMT impairs the proper functioning of OBD (On-Board Diagnostic systems)". The Canadian Petroleum Products Institute (CPPI) has offered to participate with the Canadian Motor Vehicle Manufacturers Association (CVMA) and government in managing and funding an independent study to examine the impact of MMT on vehicle performance (emissions, warranty claims) and public health. CPPI has further committed to discontinue the use of MMT if this study indicates that this is appropriate. CVMA has to date not agreed to participate.

Canadian refiners use MMT, as it is the lowest cost method for enhancing octane in gasoline. If refiners were to switch to alternative methods for octane enhancement this would increase refiners costs about 0.1-0.3 cents per litre.

Vehicle Manufacturers Views

There are potentially significant costs to a manufacturer if a vehicle fails to meet the requirements of the regulation. These costs could include AirCare failures, vehicle recalls, repair or replacement of emission control equipment as required under British Columbia's emission

warranty regulation, and financial penalties. These risks and potential costs are borne by vehicle manufacturers and ultimately consumers.

The significant concern manufacturers have about the MMT issue is reflected in the position they have taken in response to the Federal decision to lift the trade prohibition on MMT. Manufacturers have demanded that the Federal Government suspend the Tier 1 emission standards that apply to 1998 models, as manufacturers cannot guarantee their cars and trucks will meet the in-use requirements of the Tier 1 emission standard. The Federal Government's response has been to apply regulatory discretion by not requiring that in-use test data be supplied. In effect, this strategy is a de facto regulatory "off ramp" to the Federal regulation.

British Columbia Ministry of Environment Action

The Ministry continues to review this issue and the Minister has publicly called for the Federal Government to reinstate the restriction on MMT until such time as studies can be completed which demonstrate that there is no negative impact on vehicle performance or public health. As the British Columbia regulation doesn't provide "off-ramps" for manufacturers there is some urgency for the province to determine its course of action on the MMT issue.

Option 5.2.1 (Near Term, Status Quo)
– No Amendment Required

British Columbia would have to wait for further research results from the on-going work being completed by vehicle manufacturers and from a proposed federal government review of MMT. This option leaves the issue of risk with vehicle manufacturers and will require them to provide any remedies.

Option 5.2.2 (Near to Medium Term, Renewed Leadership)
– Restrict Sale of MMT

If MMT were no longer permitted for use in British Columbia gasoline then the MMT issue would no longer be of concern to vehicle manufacturers.

Option 5.2.3 (Near to Medium Term Renewed Leadership)
–Pump Labeling of Gasoline Sold With MMT

This could be accomplished either by voluntary supplier labeling of MMT free fuel, or by mandating labeling of all pumps. This option would result in every gasoline retailer that sold gasoline in the province which contained MMT prominently placing a label on each pump that dispensed this type of gasoline. The purpose of the label would be to inform motorists so that they could make a clearer choice as to which gasoline they used. Some manufacturers already have statements in their owners manuals that MMT is not recommended.

Option 5.2.4 (Medium Term, Harmonization/Streamlining)
– Adopt NLEV "Off Ramps"

The province can accommodate the concerns of manufacturers the same way the U.S. EPA has on the sulphur issue under the NLEV program. British Columbia could extend the "off ramps" provision to MMT. If manufacturers can demonstrate that a particular vehicle cannot achieve its in-use certification requirement due to the use of gasoline with MMT then that vehicle would be exempted from the regulation. As no other jurisdiction in Canada does this British Columbia would have to independently assess and rule on the data before providing an exemption. This would be a resource intensive and highly technical activity, and past experience has shown that any assessments would likely be disputed by one or more of the manufacturers, the refiners, or the additive manufacturer.

Option 5.2.5 (Medium Term, Relax BC Requirements)
– Exclude In-Use Requirements

The definitions of LEV's in both the California and NLEV rules include requirements that vehicles must be certified to the standards and must also meet in-use emissions standards. As manufacturers will certify their vehicles on California gasoline that does not use MMT they cannot guarantee these vehicles will meet the in-use requirements of the California or NLEV rule without MMT- free gasoline. A way to deal with this issue could be for British Columbia's regulation to simply exempt manufacturers from the in-use provision of both the California and NLEV regulation.

Option 5.2.6 (Medium Term, Relax BC Requirements)
– Amend Emission Warranty Regulation

Motor vehicle manufacturers advise that the use of MMT may result in OBD-2 systems triggering red warning lights on dashboards and/or higher tailpipe emissions resulting in an automatic fail during AirCare testing. This regulation could be amended to permit manufacturers an exemption from the requirement to repair such vehicles if it can be demonstrated that the cause of the failure was MMT in gasoline. This approach may be problematic with the public if vehicle operability issues are encountered from the continued use of MMT.

Option 5.2.7 (Medium Term, Relax BC Requirements)
– Amend AirCare Test Procedures

The use of MMT may result in OBD-2 systems triggering red warning lights on dashboards and/or a higher emission readings during an AirCare test of a LEV vehicle. AirCare test procedures could be amended so that model year 2001 - 2004 LEV's could be exempted from an automatic fail as long as MMT remained in gasoline sold in the province.

Options 5.2.5, 5.2.6, and 5.2.7 could all be linked to the active technical and financial participation of the motor vehicle manufacturers in a third party study regarding the impact of MMT on LEV vehicles and public health.

ISSUE 5.3 – FUTURE FUEL QUALITY

Key Question – Should British Columbia move to adopt more stringent fuel quality criteria for gasoline sold in the province?

Discussion -Developments in California and other jurisdictions may suggest the need for more stringent fuel quality requirements to achieve air quality goals and support the operation of emerging cleaner technologies such as direct injection and fuel cells. Discussions among regulators, fuel suppliers and vehicle manufacturers are on-going and it may be some time before a clear consensus emerges on exactly what fuels are needed for different engine technologies to ensure that these technologies operate at their designed emission standard. It is noted that California has opened a discussion on the technical specifications of gasoline that could be used in fuel cell vehicles and that the major vehicle manufacturers have recently published their position on fuel quality issues. It is unclear whether these developments will result in changes to general fuel quality, or lead to the development of one or more niche fuels suitable to the new technologies.

Option 5.3.1 – (Longer Term - Tracking)

- Monitor Future Fuel Quality Specifications In Other Jurisdictions

The Ministry and the CTV committee should monitor this issue and an update on relevant events in other jurisdictions should be included in the CTV committee's annual report to the Minister.

6. OTHER MATTERS

BACKGROUND

When the regulation was enacted it was recognized that a number of important policy issues related to technology, local air quality and climate change were inter-linked. Section 9 of the regulation anticipated the need for the province to respond to these issues by establishing clear objectives and a consultative mechanism to address these objectives.

CTV Committee Mandate

The Clean Technology Vehicle committee was established by the Minister "*for the purposes of reducing greenhouse gas emissions and other emissions related to motor vehicles*". Specifically, its tasks are to:

- Promote the purchase by consumers of vehicles that have been certified to the California TLEV, LEV, and ULEV standards earlier than that required under Schedule 1 of the regulation.

- Promote the purchase of ULEV's, HEV's, and ZEV's so that their annual sales equal or exceed that indicated in Schedule 2 of the regulation.

- Identify constraints to the use of ULEV's, HEV's, and ZEV's and recommend how these constraints could be overcome.

The issue of fuel quality has been identified as a significant constraint to introduction of LEV technologies; it may be useful to consider broadening the mandate of the committee to address this issue.

LEV's & Greenhouse Gases

The LEV program first initiated in California was constructed around the short-term need to mitigate emissions that impacted on local air quality. Gasoline fueled LEV's make no contribution to reducing greenhouse gas emissions.

In the longer term the regulatory effort by California to introduce ZEV's and innovative technologies such as fuel cell vehicles will have a positive result. In the next decade an ever-widening range of vehicles will be offered that not only have extremely low tailpipe emissions or none at all but also much lower greenhouse gas emissions. Depending on diesel fuel quality developments California's recent designation of particulates in diesel exhaust as a carcinogen may hamper the plans of several manufacturers to introduce super fuel efficient vehicles that use diesel engines.

It should also be noted that the Governments of United States and Canada in conjunction with some vehicle manufacturers have invested significant resources in a program to design a cost efficient vehicle that will dramatically reduce greenhouse gas emissions. This program, the Partnership for Next Generation Vehicle, has as its goal a vehicle design that will achieve a fuel efficiency rating of 80 miles per gallon.

Greenhouse Gas Policies

In British Columbia, it is forecast that based on current usage patterns emission levels will be 35 percent or more *above* the 1990 levels by the Year 2010. It is estimated that about 40 percent of the province's greenhouse gas emissions are related to the use of vehicles. The issue of greenhouse gas emissions has taken on increased importance as the Canadian Government has become a signatory to the December 1997 Kyoto Protocol to limit greenhouse gas emissions. As part of the Kyoto Protocol Canada committed to meeting an emission reduction target of 6 percent below 1990 emission levels by Year 2010.

The province's Greenhouse Gas Action Plan recognizes that a balanced, multi-front approach is needed to stabilize and reduce greenhouse gas emissions from the transportation sector. These approaches include a faster fleet turnover, more stringent fuel efficiency standards, more extensive use of public transit, enhanced use of alternative and renewable fuels and new vehicle technologies

In this regard the BC Greenhouse Gas Forum has supported the use of this regulation to achieve greenhouse gas emission reductions. The Forum has recommended that, as part this regulatory review, measures be identified to enhance greenhouse gas emission reductions, including consideration of replicating California manufacturer requirements for ZEVs. The Forum recommended that changes to the regulation be implemented by July 1, 1999, and that the government report back to the Forum by July 1999. Manufacturers have noted that as well as tracking changes in California ZEV requirements, there are issues related to the suitability of ZEV technology for the range of climatic conditions experienced in British Columbia.

There is no greenhouse gas emissions reduction target in the regulation, but the CTV committee is able to address both the sales targets for cleaner technology vehicles and the greenhouse gas issue by the promotion of ZEV's, HEV's, and ULEV 's that use alternative and renewable fuels. To the extent vehicles which use renewable fuels can be sold this vehicle/fuel combination has the potential of substantially reducing net greenhouse gas emissions over that of a gasoline fueled vehicle.

ISSUES

The report examines the following issues and identifies options for addressing each issue as follows:

Issue 6.1 –CTV Sales Targets
- *Option 6.1.1 (Near Term, Harmonization/ Streamlining)*

– Broaden the committee mandate to include fuel quality
- *Option 6.1.2 (Medium Term, Renewed Leadership)*

– Higher NMOG Credits For CTV's
- *Option 6.1.3 (Medium Term, Renewed Leadership)*

– Amend CTV Sales Targets In Schedule 2
- *Option 6.1.4 (Medium Term, Renewed Leadership)*

– Amend CTV Sales Target To Sales Mandate

Issue 6.2 – Greenhouse Gases
- *Option 6.2.1 (Medium Term, Harmonization/ Streamlining)*

– Voluntary Offer From Manufacturers
- *Option 6.2.2 (Medium Term, Harmonization/ Streamlining)*

Credits Under GERT
- *Option 6.2.3 (Medium Term, Renewed Leadership)*

– Include High MPG Vehicles In CTV Definition

ISSUE 6.3 –Incentives For Renewable Fuels
- *Option 6.3.1 (Medium Term, Renewed Leadership)*

– NMOG Credits For Renewable Fueled Vehicles
- *Option 6.3.2 (Medium Term, Complementary Action)*

– Amend Motor Fuel Tax Act
- *Option 6.33 (Medium Term, Complementary Action) - Technology Incentives*

ISSUE 6.1 – CTV SALES TARGETS

Key Question - How can the CTV targets in Schedule 2 be achieved?

Discussion – The CTV sales target percentage of new vehicle sales for 1998 and later model years was originally designed to emulate the sales mandate of ZEV's that were to be sold in the state of California over the same period. Subsequent to the enactment of this regulation California changed its approach on the ZEV issue and permitted vehicle manufacturers a more gradual introduction rate of ZEV's up to the model year 2003. In that model year 10% of all new vehicles sold in that state must be ZEV's.

British Columbia vs. California

British Columbia's sales target approach in Schedule 2 provides manufacturers with more flexibility than in California on the types of vehicle that can be used to achieve the sales targets. As a result these sales targets should be more readily achievable. An advantage of widening the types of vehicles that can qualify for the sales target is that this permits a wider array of engine technologies and fuels to be sold that are effective in addressing both the local air quality and greenhouse gas issues.

For example, vehicles that are designed to operate on the renewable fuel ethanol and meet a ULEV certification would satisfy the Schedule 2 requirements while these vehicles would not satisfy the ZEV requirements in California. In this instance, tailpipe emissions would be extremely low while greenhouse gas emissions have the potential for being much lower than if the vehicle operated on gasoline.

CTV Availability

For the 1998 model year the number of vehicles that have been offered for sale in California which have been certified to the ULEV, HEV or ZEV standards is extremely limited. This has had an impact on the British Columbia market in that vehicle types such as those operating on alternative fuels like natural gas (NGV's) have been offered in limited quantities. At the same time their market appeal has been limited by high incremental retail prices and to some extent a limited refueling infrastructure.

At the time this regulation was enacted the only vehicle that met the ULEV standard was one that operated on natural gas. Since that time there has been a growing number of gasoline-fueled vehicles that have been certified as ULEV's. For example, Mazda is selling a 1999 model in British Columbia that meets ULEV requirements when using California gasoline. Sales of this vehicle in British Columbia will satisfy the Schedule 2 criteria. The ability of vehicle manufacturers to produce and certify gasoline-fueled vehicles that meet ULEV standards will be another major impediment to wider market acceptance of alternative fuels.

CTV Committee

The CTV committee has achieved some important success in identifying barriers to the purchase of lower emission vehicles and in promoting the purchase and use of these types of vehicles. To date, the major success has been related to some manufacturers selling in British Columbia vehicles that have been certified in California to the LEV emission standard.

At the same time the CTV committee has not been as successful in generating sales of ULEV's, HEV's, and ZEV's as per the sales target for the 1998 model year as indicated in Schedule 2 of the regulation. This situation is not due to the work of the committee but rather can be attributed to a complex interplay of vehicle pricing and availability issues, alternative fuel availability and pricing, and taxation policies.

Although significant numbers of LEV's were sold the 2% CTV sales targets for the 1998 model year has not been met and given the current announced model availability in the province for the 1999 model year it doesn't appear that the sales target for next year will be met either. The combination of ULEV certified vehicles operating on gasoline, Toyota's HEV and vehicles that can use alternative fuels may result in model year 2000 sales targets being satisfied.

Option 6.1.1 (Near Term, Harmonization/Streamlining)
– Explicitly Identify Fuel Quality In CTV Mandate

The issue of the relationship between fuel quality and the emission performance of vehicles has been recognized not only in British Columbia but also in different jurisdictions. The role of fuel quality has not been explicitly recognized in the mandate of the CTV committee. The regulation could be amended to bring this issue more formally into the mandate or the CTV committee could agree to incorporate this issue into its considerations.

Option 6.1.2 (Medium Term, Renewed Leadership)
– Higher NMOG Credits For CTV's

Currently, the regulation sets out NMOG credits based on fleet averages. While this approach does provide some incentive for manufacturers to sell lower emission vehicles sooner than required, the value of the incentive is low relative to the technological and market challenges of making ZEV's, HEV's and ULEV's available for sale. A higher market value recognizing this early action by manufacturers in the form of a limited time, high incentive NMOG credit might encourage manufacturers to better meet the CTV sales targets.

For example, a differentiated credit scale for the sale of a CTV vehicle could be established. The sale of a ULEV on gasoline or a high fuel efficiency vehicle could be deemed equal to three gasoline LEV's, an ULEV using a sealed fueling system like natural gas could be equal to five gasoline LEV's, an HEV could be equal to seven gasoline LEV's and a ZEV could be equal to ten gasoline LEV's.

Option 6.1.3 (Medium Term, Renewed Leadership)
– Amend Sales Targets In Schedule 2

Schedule 3 of the regulation could be amended to reflect the fact that the first two years will not likely be met by, for example, adding the unmet targets to subsequent model years. This would permit the province to stay on track with respect to its CTV goals.

Option 6.1.4 (Medium Term, Renewed Leadership)
– Amend CTV Sales Target To Sales Mandate

The regulation could be amended to change the CTV sales target into a sales mandate similar to but not identical to that in California. This would be controversial and could only likely be done starting some future model year such as year 2001 to permit enough time for manufacturers to ensure that product was available.

ISSUE 6.2 – GREENHOUSE GASES

Key Question – Are new approaches needed in the regulation to foster the sale of those CTV's that substantially reduce greenhouse gas emissions?

Discussion – A method for the CTV committee to achieve its goal of reducing greenhouse gas emissions is to initiate activities that foster the sale of more CTV's as currently defined as well as very high fuel efficiency vehicles in the province.

A number of manufacturers sell high fuel efficiency vehicles using gasoline or diesel. The prospects for continuing rapid product innovation for future model years also appears hopeful. For example, Toyota has publicly indicated that its Hybrid Electric Vehicle (HEV) model known as Prius will be marketed in Canada in model year 2000 and at a relatively modest incremental price over a comparable vehicle. This particular vehicle will not only have extremely low tailpipe emissions but also a high fuel efficiency rating thereby reducing greenhouse gas emissions.

At the same time there are market challenges in selling a significant number of high fuel efficiency vehicles. These vehicles are smaller in size and have small engines, thereby limiting their market appeal. Measures could be taken under this regulation that may increase sales of this type of vehicle.

Option 6.2.1 (Medium Term, Harmonization/Streamlining) – Voluntary Offer From Manufacturers

In response to the Kyoto Protocol vehicle manufacturers have offered in the European Union and are considering for Asia a commitment to reduce vehicle CO2 emissions by about 25 percent from the current fleet average fuel economy. This voluntary commitment is an approach that should be explored with Canadian vehicle suppliers, many of which sell products in both Europe and Asia.

A key strategy for manufacturers to address this goal is to substantially increase the use of diesel engines in cars. While the use of more energy efficient diesel engines would reduce greenhouse gas emissions a large switch to this type of technology may not be compatible with concerns about air quality issues such as fine particulate emissions. This concern has already emerged in California which may prevent the increased use of diesel engines in that state.

Option 6.2.2 (Medium Term, Harmonization/Streamlining)
– Credits Under GERT

The Greenhouse Gas Emission Reduction Trading (GERT) program is a pilot program whereby buyers and sellers can trade greenhouse gas emission credits. In concept, high fuel efficiency vehicles could be deemed to generate a credit if such vehicles had a lower level of greenhouse gas emissions relative to a base line of emissions. This credit could then be sold to a buyer through the GERT program thereby reducing costs for a manufacturer to sell that vehicle in the province. This option is worth exploring further.

Option 6.2.3 (Medium Term, Renewed Leadership)
– Include High MPG Vehicles In CTV Definition

Fuel economy directly affects the amount of greenhouse gas emissions from vehicles. One way for the CTV committee to achieve its greenhouse gas emissions goals is to amend the definition of CTV to include vehicles operating on any fuel that achieved high fuel efficiency rating (e.g. 50 mpg) and met the LEV standard. Additionally, an incentive could be provided to manufacturers by extending higher NMOG credits for these types of vehicles. In this situation there may be a need to amend the non-binding sales targets in Schedule 2 upward to accommodate this approach.

ISSUE 6.3 - INCENTIVES FOR ALTERNATIVE AND RENEWABLE FUELS

Key Question – Are actions needed to foster the introduction and use of alternative and renewable fuels in order to address the greenhouse gas issue?

Discussion –One method for the CTV committee to achieve the goal of reducing greenhouse gas emissions is to have a larger percentage of existing and future vehicles use alternative and renewable fuels like ethanol. Alternative fuels like natural gas and propane and renewable fuels like ethanol provide some greenhouse gas benefits. It should be noted that the incentives identified under Option 2.2.1 of this report would likely foster an increase in the number of alternative fueled vehicles operating in the province.

LEV vehicles are now being sold in the United States that operate on fuels that contain up to 85 percent ethanol. There appears to be some prospect that these vehicles could be sold in the province at a minor incremental cost. One of the benefits in the United States for a manufacturer to sell alternative fueled vehicles is that under the U.S. fuel efficiency CAFE standards such vehicles qualify for an additional CAFE credit. No similar incentive exists in Canada, or in the British Columbia regulation. If such an incentive were in place it might act to "pull" new vehicles and renewable fuels into the market.

While, in theory, vehicles that use renewable fuels could reduce greenhouse gas emissions a major barrier to the use of this fuel is cost. The cost of producing a renewable fuel like ethanol is considerably higher than that of gasoline. This has had the result that some fuel marketers in

Canada only sell low-level blend ethanol as an octane enhancer in premium grade gasoline. This suggests that the sales of this renewable fuel in all vehicles, not just LEV's, could be greatly increased if production technology improved to the point that ethanol could be produced at a competitive price to gasoline. A lower cost for ethanol might also be used by some refiners as a substitute for other octane enhancers such as MMT and MTBE.

The province has a substantial resource base of renewable wood and wood waste that could potentially be used for the production of fuels like ethanol and methanol. There are three major challenges to producing fuels from this biomass material as follows:

- The technology to produce these fuels from this type of feedstock is not yet well proven in terms of its operational performance and reliability

- The cost of producing a litre of fuel is much higher compared to using conventional feedstocks such as natural gas

- The energy consumed to produce the fuel may be, depending on the technology used, the same or greater than the amount of fuel produced from the process resulting in no greenhouse gas emission gains.

British Columbia has recognized the policy value of facilitating the entry of new transportation fuels by exempting or applying only a minimal tax on fuels other than gasoline and diesel. Although high level blends of ethanol are exempt from the Motor Fuel Tax Act low-level blends of ethanol and methanol are not.

Option 6.3.1 (Medium Term, Renewed Leadership)
– NMOG Credits For Renewable Fueled Vehicles

Similar to the possible approach suggested for CTV's or high mpg vehicles an NMOG incentive could be created for the sale of vehicles that could use a high blend of renewable fuels.

Option 6.3.2 (Medium Term, Complementary Action)
– Review British Columbia's Motor Fuel Tax Act Treatment

The Motor Fuel Tax Act currently does not provide any tax exemption for the use of low-level blends of renewable fuels like ethanol in gasoline. The Motor Fuel Tax Act could be amended to reduce the tax level on such fuels, thereby improving the economics of production and sale.

Option 6.3.3 (Medium Term, Complementary Action)
- Technology Incentives

The lack of commercially proven technology that can produce a renewable fuel at a competitive price to gasoline is a major barrier to the production of renewable fuels from the province's large wood bio-mass base. This bio-mass resource holds long term potential for the province

but there is significant risk for investors to build pilot plants to demonstrate the technology, especially given the lack of existing vehicles that could use this fuel (in high level blends) and lack of tax support for low level blends.

Federal and provincial incentives should be considered for investors to build pilot plants to prove up technology that would produce renewable fuels from wood. It is noted that an interagency task force in the province is currently reviewing this situation.

APPENDIX 1

LIST OF TERMS

CAFC	**Corporate Average Fuel Consumption (Canada)**
CAFE	**Corporate Average Fuel Economy (United States)**
CanLEV	**Canadian Low Emission Vehicle Program**
CARB	**California Air Resources Board**
CTV	**Cleaner Technology Vehicle**
FVRD	**Fraser Valley Regional District**
GHG	**Greenhouse gases**
GVRD	**Greater Vancouver Regional District**
LEV	**Low Emission Vehicle**
LEV II	**Low Emission Vehicle Program, Second Generation**
MELP	**Ministry of Environment, Lands and Parks**
MOU	**Memorandum of Understanding**
NGV	**Natural gas vehicle**
NLEV	**National Low Emission Vehicle**
NMOG	**Non Methane Organic Gases**
TLEV	**Transitional Low Emission Vehicle**
ULEV	**Ultra Low Emission Vehicle**
SULEV	**Super Ultra Low Emission Vehicle**
ZEV	**Zero Emission Vehicle**

APPENDIX 2

Suggested detailed changes under Option 2.3.1
(NOTE – appropriate legal language would be required):

PART 1

- Part 1, Section 1 – new definitions would be needed pertaining to "Canada Tier 1 vehicle", "Canadian Federal emission control label", "National Low Emission Vehicle" and "National Low Emission Vehicle label". As appropriate, in this section the amendments would permit a vehicle manufacturer to meet the California, NLEV or Canadian Tier 1 requirements.
- Part 1, Section 1 – The references to TLEV, LEV, ULEV, HEV and ZEV must be updated to reflect the title of the new California regulations.

PART 2

- Section 4 (a) – amend to include "or a Canada Tier 1 vehicle".
- Section 4 (b) - amend to include "or Canadian Federal emission control label".
- Section 5 (1)(a) – amend to include "or a Canada Tier 1 vehicle or a National Low Emission Vehicle".
- Section 5 (1)(b) - amend to include "Canadian Federal emission control label or "National Low Emission Vehicle label".
- Section 5 (4) - amend to include "produced and delivered for sale in the United States under the NLEV rule".
- Section 5 (6)(b) - amend to include "or a Canada Tier 1 vehicle".
- Section 6 (2) - amend to include "Canadian Federal emission control label or "National Low Emission Vehicle label".
- Section 6 (2) - amend to include "or a Canada Tier 1 vehicle".

PART 3

- Section 7(2)(3)(4)(5) – delete, as no longer valid