

The Canadian Petroleum Products Institute - Comments on Biodiesel

**Fleet Challenge – British Columbia
Biodiesel 101 Workshop
Vancouver, BC**

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Biodiesel 101 Workshop

Purpose:

- Provide stakeholders with CPPI's perspectives on Biodiesel.

Discussion Points:

- Who is CPPI?
- Position on Biodiesel
- Barriers and issues
- Biodiesel realities
- Questions for consideration
- Recommendation
- Back up information



Who is the CPPI?

- **The Canadian Petroleum Products Institute (CPPI) is an industry association representing Petroleum Refiners and Marketers in Canada.**
- **CPPI member companies operate over 80% of Canadian domestic refining capacity and supply in excess of 80% of fuel sold in Canada.**
- **CPPI western Refinery members are Chevron, Husky, Esso, Petrocan, and Shell. The three Edmonton based refineries supply over two-thirds of BC's demand for petroleum products.**
- **The majority of Distribution and Marketing facilities in BC are operated by CPPI member companies.**

CPPI member companies are committed to:

- **Reliably supply fuels and other products that consumers will choose over competing alternatives for their overall performance, environmental benefits and economic value.**
- **Continue to improve the environmental performance of refineries and other installations to align with leading facilities in competing jurisdictions.**
- **Operate in and promote free markets in order to maximize Canadian benefits by remaining competitive nationally and internationally.**
- **Being the long run fuel supplier of choice for current and future vehicle and engine technologies.**

CPPI position on Biodiesel

- **CPPI is neither for nor against the use of Biodiesel as a fuel.**
- **CPPI does not support mandating the use of Biodiesel in fuels.**
- **We believe that consumers will accept Biodiesel blends if the cost and performance are competitive with current fuels.**
- **There are a number of technical issues which need to be resolved prior to any widespread use of Biodiesel.**

CPPI members do not support mandates.

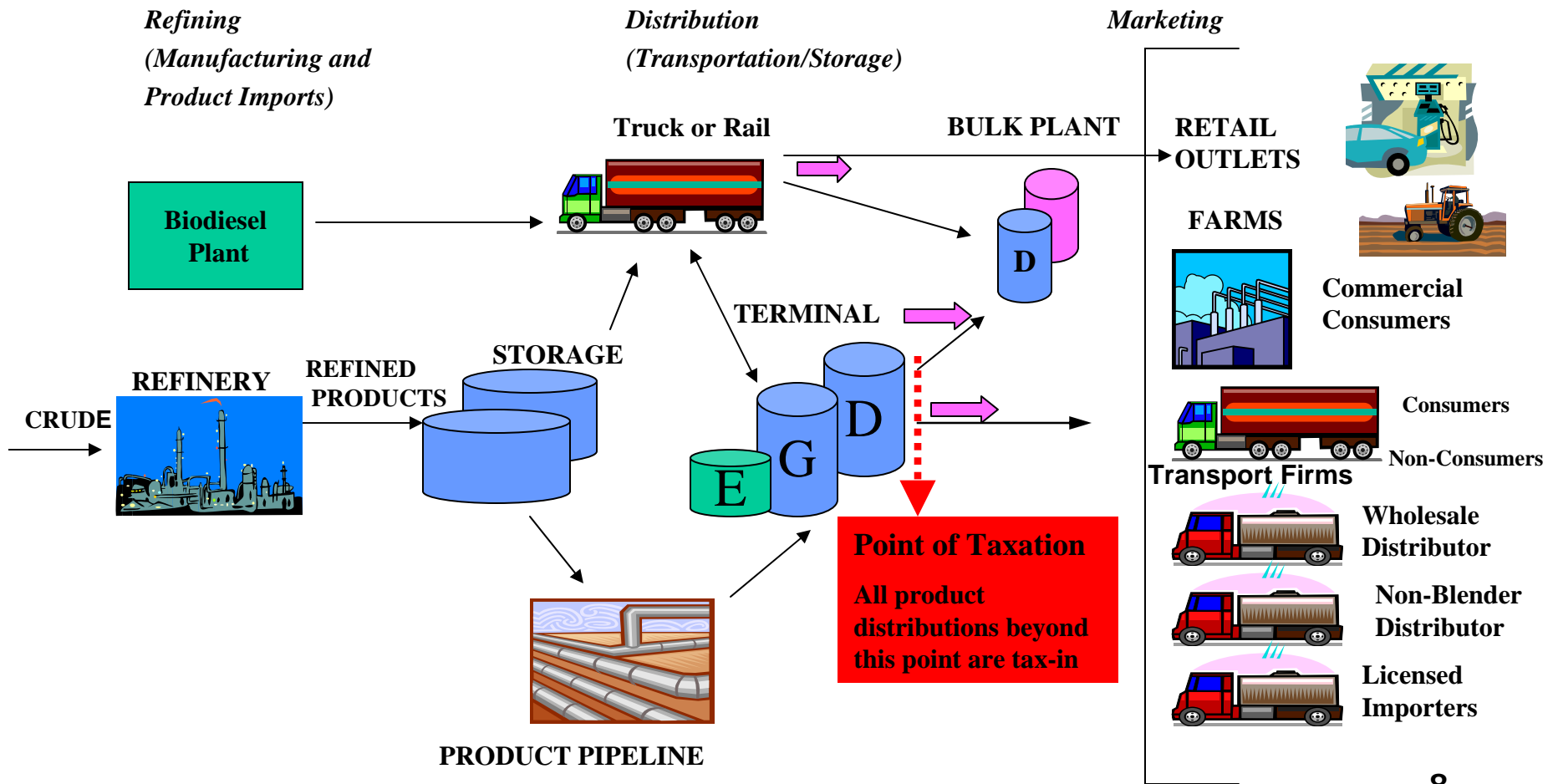
- **CPPI supports government frameworks for markets which allow free flow of trade and capital. This is most efficient for consumers.**
- **Introduction of new fuel components using market forces provides the necessary incentives to improve quality and/or efficiency of production. Hence new components become commercially viable and competitive.**
- **Any mandate of Biodiesel may force consumers or taxpayers (or both) to bear higher costs.**
- **Biodiesel may be politically attractive, but it may be hard to identify any compelling cost effective, sustainable environmental / economic benefits.**

Potential barrier to Biodiesel penetration may be the cost:

- **Some studies have indicated that Biodiesel component costs are two to four times as much as petroleum derived diesel fuel.**
- **Blenders will be looking for unrestricted access to the most cost effective sources of Biodiesel. Any constraints on using imports and domestic production alternatives (rendering or grain based) could result in trade issues and higher costs to consumers.**
- **Any future plans must recognize the integrated nature of the existing diesel supply system in the Province of BC and throughout Canada.**
- **Any Biodiesel requirement or mandate that increases costs may cause some customers (truckers) to purchase fuel outside of jurisdiction.**



Downstream Distribution of Refined Petroleum Products in Canada



Issues for the fuel supplier

- **Biodiesel must be blended into the fuel at or near the end user**
 - **Blended fuels are not compatible with pipeline movements (especially multi product pipelines).**
 - **Supply from the biodiesel plant will probably be limited to rail &/or truck delivery.**
- **Existing distribution systems will need to be monitored for any possible contamination issues due to the introduction of the biodiesel.**
- **Blending Biodiesel at a Terminal will require additional capital for the biodiesel tank(s) and rack injection systems. Most locations will require heated storage for the biodiesel component.**
- **Most Terminals do not have the ability to supply multiple types of diesel (such as blended or unblended).**

Additional Items to Consider

- **The Federal Government has regulated the sale of Ultra Low Sulphur Diesel (ULSD) with sulphur levels reduced to 15 ppm. On road by Sept. 2006; off road in 2010; rail & marine in 2012.**
- **Consequently there will be varying levels of sulphur in the components used to create the blends dependent upon the end use.**
- **It is unclear at present how biodiesel will fit in these regulations.**
- **Compatibility of ULSD with Biodiesel needs to be well understood before Biodiesel can be introduced.**
- **The impact of the biodiesel blend on the properties of ULSD (such as lubricity, cold flow, stability, elastomer compatibility, etc) will need to be properly tested prior to any broad usage.**

Additional Items to Consider (cont'd)

- **Very limited amounts of ULSD are currently produced by refineries in Canada. As the current limit for sulphur content for on-road use is 500 ppm it would be difficult to segregate any of this quality of fuel.**
- **As refiners modify their refineries to meet the new on-road limit of 15 ppm sulphur by September 2006 more ULSD will become available but it will not generally be segregated from the current on-road diesel fuel pool.**
- **The feasibility of introducing biodiesel in certain areas of the country only may produce unwanted effects (such as a biodiesel blend that is purchased in the Lower Mainland in January and used in a truck that is on its way to the Prairies).**

Technical barriers which need to be addressed:

- **There is a potential risk to vehicle performance with some older engines and some off road equipment. Users need to be aware. Biodiesel blends have no established track record to date.**
- **Current and developing engine technologies must be factored into the equation. Some of the benefits claimed in literature will need to be re-evaluated with consideration of EGR (exhaust gas recirculation), NO_x absorbers, PM (Particulate Matter) traps and advanced engine technology starting with the 2007 model year.**
- **Currently, EMA (Engine Manufacturers Association) recommends against using Biodiesel in 2007 and later model year engines.**

Technical barriers which need to be addressed:

- **Technical characteristics of the blended fuel requires a close review. Fuel lubricity, cetane quality, sulphur content, cold flow properties, elastomer compatibility and thermal stability are examples.**
- **There is a need to check on how Biodiesel blends will impact on engine warranties.**
- **Canadian winter operability (perhaps not an issue in the Lower Mainland?) and increased fuel consumption are significant issues.**
- **The characteristics of the Biodiesel are known to vary with the type of feedstock used to produce the Biodiesel.**
- **Adherence to the new CGSB standard should be required.**
- **We need to know much more about Biodiesel before any regulated program is contemplated.**

Biodiesel Realities

- **Biodiesel costs more to produce than petroleum based diesel.**
- **Blending biodiesel at a Terminal will add cost & complexity.**
- **In the short term most biodiesel will likely have to be sourced from the USA.**
- **Biodiesel does improve lubricity BUT it is not as cost-effective as currently available lubricity additives. These purposely designed lubricity additives can treat fuel for less than 0.1 cents per litre. They are added at treat rates which are a small fraction of that required for the same impact on lubricity using biodiesel.**
- **Most biodiesels will improve cetane quality when added to diesel.**
- **All biodiesels will have a negative impact on the cold flow properties of the blended diesel fuel.**
- **Some biodiesels have poor thermal stability.**

Questions a Fleet Manager Should Ask Before Opting for a Biodiesel Blend?

- 1. Why am I doing this? What do I want to achieve?**
 - Environment
 - GHG emissions reduction
 - Public image

How will I measure success?

- 2. What Biodiesel Blend do I want B2, B5, B20? For all my fleet or part of my fleet?**
- 3. Will my current fuel supplier provide me a biodiesel blend? Will I do my own blend?**
- 4. What will it cost? (cpl, fuel economy, investment)**

Questions a Fleet Manager Should Ask Before Opting for a Biodiesel Blend?

- 5. Where will my biodiesel come from and will it meet ASTM/CGSB specifications? Will all the needed additives (stabilizers, fungicides, etc.) be present in the biodiesel blend?**
- 6. Will the use of the biodiesel blend void my engine warranty? Will my fuel supplier guarantee the performance of my fuel?**
- 7. Where will the B100 and biodiesel blend be stored? (heated tanks or indoors) How will the biodiesel be blended with the diesel? What will the temperature of the B100 and the diesel be on blending?**

Questions a Fleet Manager Should Ask Before Opting for a Biodiesel Blend?

- 8. What preparations do I need to make for tankage at my site? On my vehicles prior to the introduction of biodiesel blends? (filters) Are all my vehicles/equipment compatible with biodiesel?**
- 9. Are any vehicles using a biodiesel blend travelling to areas where temperatures will be a factor? Are my vehicles parked indoors?**
- 10. How will I monitor the performance and maintenance of biodiesel use? Will a slight reduction in power be factor for my vehicles?**
- 11. If biodiesel causes some problems with some vehicles do I have a contingency plan?**

CPPI recommends:

- **That any new Biodiesel policy should:**
 - **Clearly articulate the objectives of the policy,**
 - **Engage stakeholders early to ensure practical considerations are identified, and**
 - **Develop cooperative test programs to fill the knowledge gaps.**

- **That the most appropriate market segments for Biodiesel be identified.**

Biodiesel 101 Workshop

Back up information

ENGINE MANUFACTURERS ASSOCIATION TECHNICAL STATEMENT ON THE USE OF BIODIESEL*

- **Depending on the biomass feedstock and the process used to produce the fuel, B100 fuels should meet the requirements of either ASTM D 6751 or an approved European specification.**
- **Biodiesel blends up to a maximum of B5 should not cause engine or fuel system problems, provided the B100 used in the blend meets the requirements of ASTM D 6751, DIN 51606, or EN 14214. Engine manufacturers should be consulted if higher percentage blends are desired.**
- **Biodiesel blends may require additives to improve storage stability and allow use in a wide range of temperatures. In addition, the conditions of seals, hoses, gaskets, and wire coatings should be monitored regularly when biodiesel fuels are used.**

ENGINE MANUFACTURERS ASSOCIATION TECHNICAL STATEMENT ON THE USE OF BIODIESEL*

- **Although the actual loss will vary depending on the percentage of biodiesel blended in the fuel, the net effect of using B100 fuel is a loss of approximately five to seven per cent in maximum power output.**
- **Neat biodiesel and biodiesel blends reduce particulate, HC and CO emissions and increase NO_x emissions compared with petroleum-based diesel fuel used in an unmodified diesel engine. Neither B100 nor biodiesel blends should be used as a means to improve air quality in ozone non-attainment areas.**

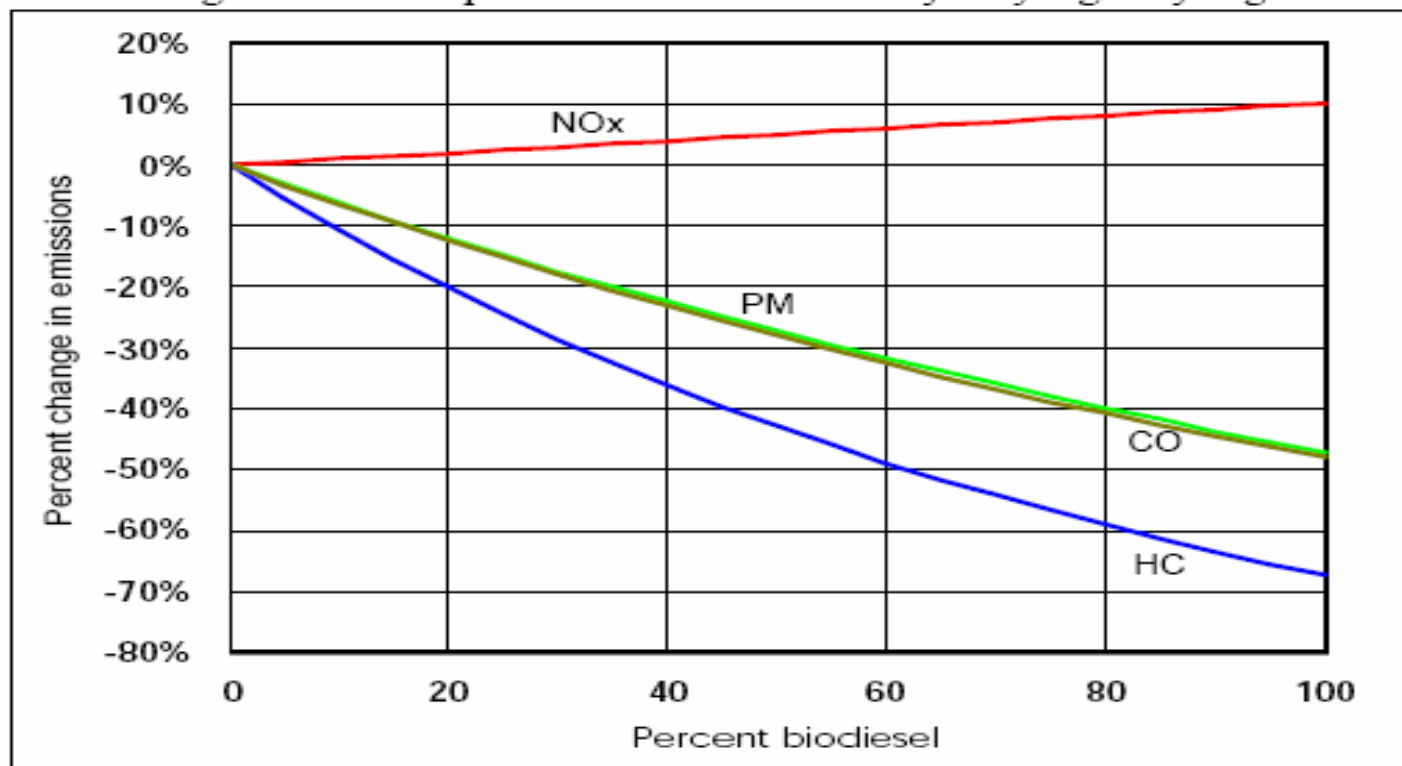
ENGINE MANUFACTURERS ASSOCIATION TECHNICAL STATEMENT ON THE USE OF BIODIESEL*

- **Biodiesel fuels have generally been found to be nontoxic and are biodegradable, which may promote their use in applications where biodegradability is desired.**
- **Individual engine manufacturers determine what implications, if any, the use of biodiesel fuel has on the manufacturers' commercial warranties.**
- **Although several factors affect the cost of biodiesel fuel, its average cost exceeds that of petroleum-based diesel fuel. The relative cost of converting an existing fleet to biodiesel blends, however, is much lower than the cost of converting to other alternative fuel.**

** DATED: February 2005-Excerpt from the Manitoba Biodiesel Panel Report*

US EPA Assessment of Biodiesel Blend Emissions Impact

Figure ES-A
Average emission impacts of biodiesel for heavy-duty highway engines



Biodiesel also reduces GHG emissions but at a high cost per tonne of CO₂

US EPA Assessment of Biodiesel Blend Emissions Impact

Table ES-A
Emission impacts of 20 vol% biodiesel
for soybean-based biodiesel added to an average base fuel

	Percent change in emissions
NO _x	+ 2.0 %
PM	- 10.1 %
HC	- 21.1 %
CO	-11.0 %

A 20% Biodiesel Blend will also reduce fuel economy by 1-2%

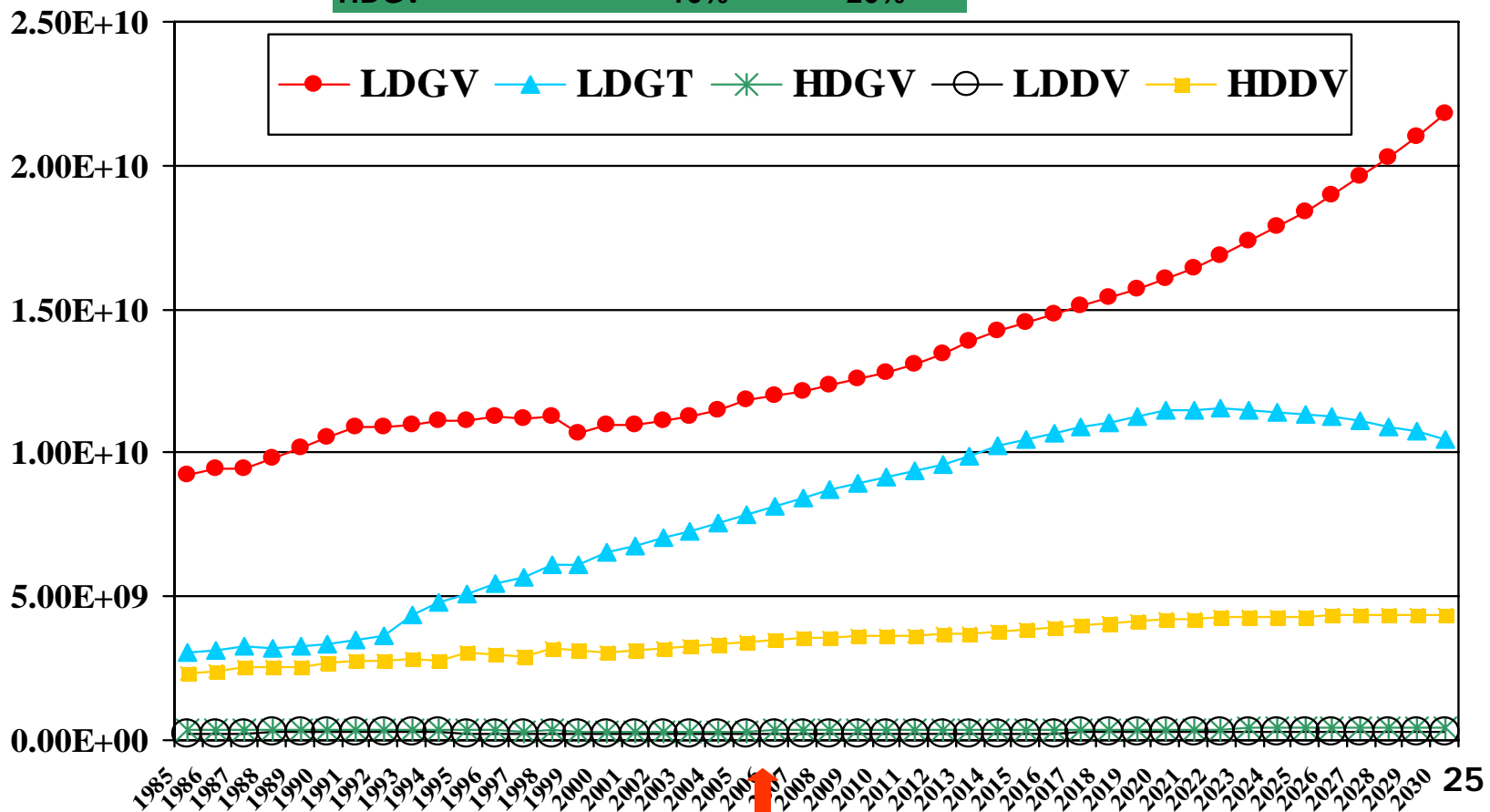
On-Road Vehicle Emission Inventories for 1985 – 2030

Vehicle Kilometers – Lower Fraser Valley

Increases:

	(1985-2030)	(2005-2030)
LDGV	136%	84%
LDGT	247%	33%
HDGV	16%	26%

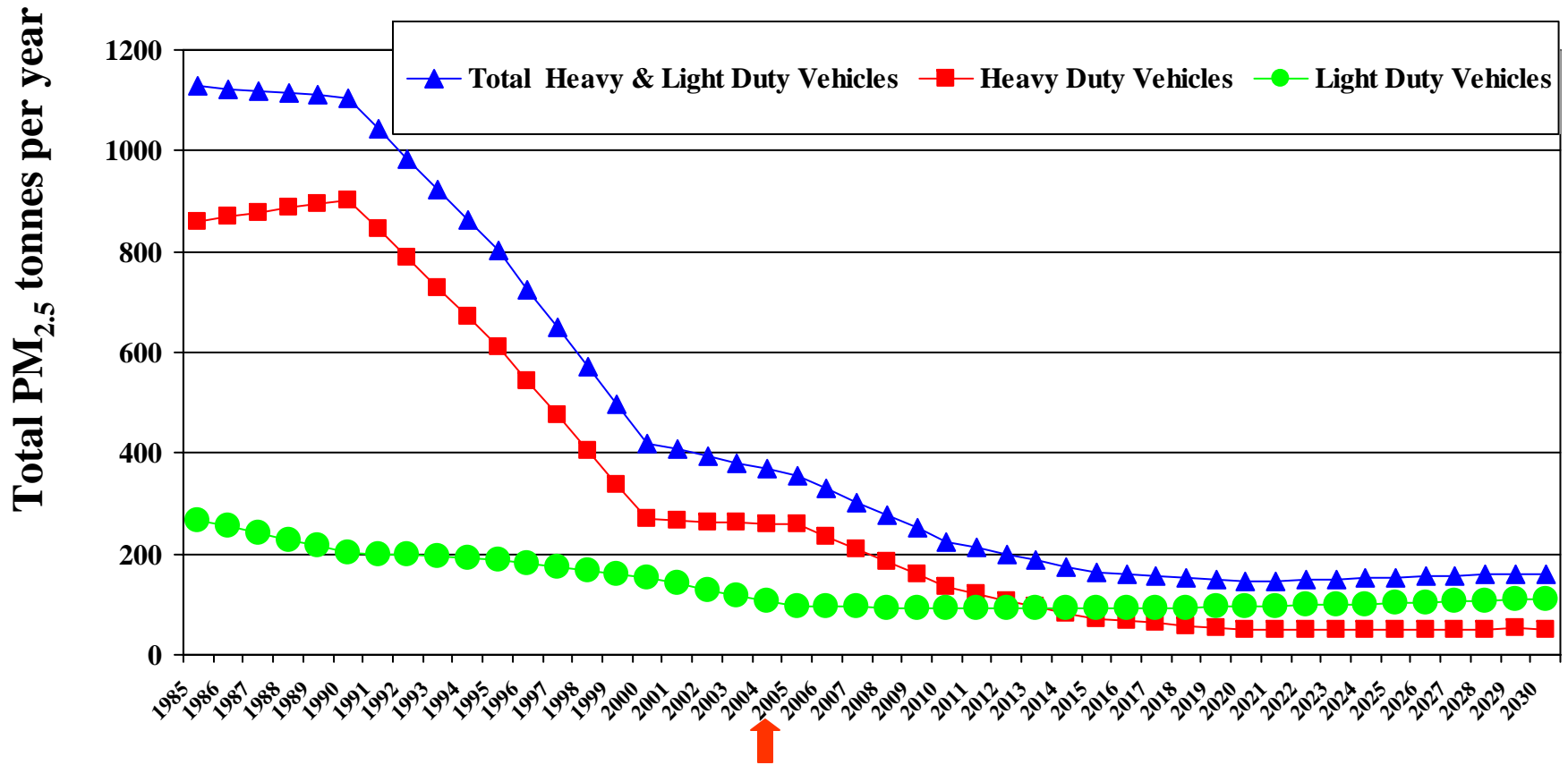
	(1985-2030)	(2005-2030)
LDDV	28%	45%
HDDV	85%	26%



On-Road Vehicle Emission Inventories for 1985 - 2030

TOTAL PM_{2.5}* - Lower Fraser Valley

% Reduction:
 (1985 - 2030) ⇒ **86%** (2005 - 2030) ⇒ **54%**



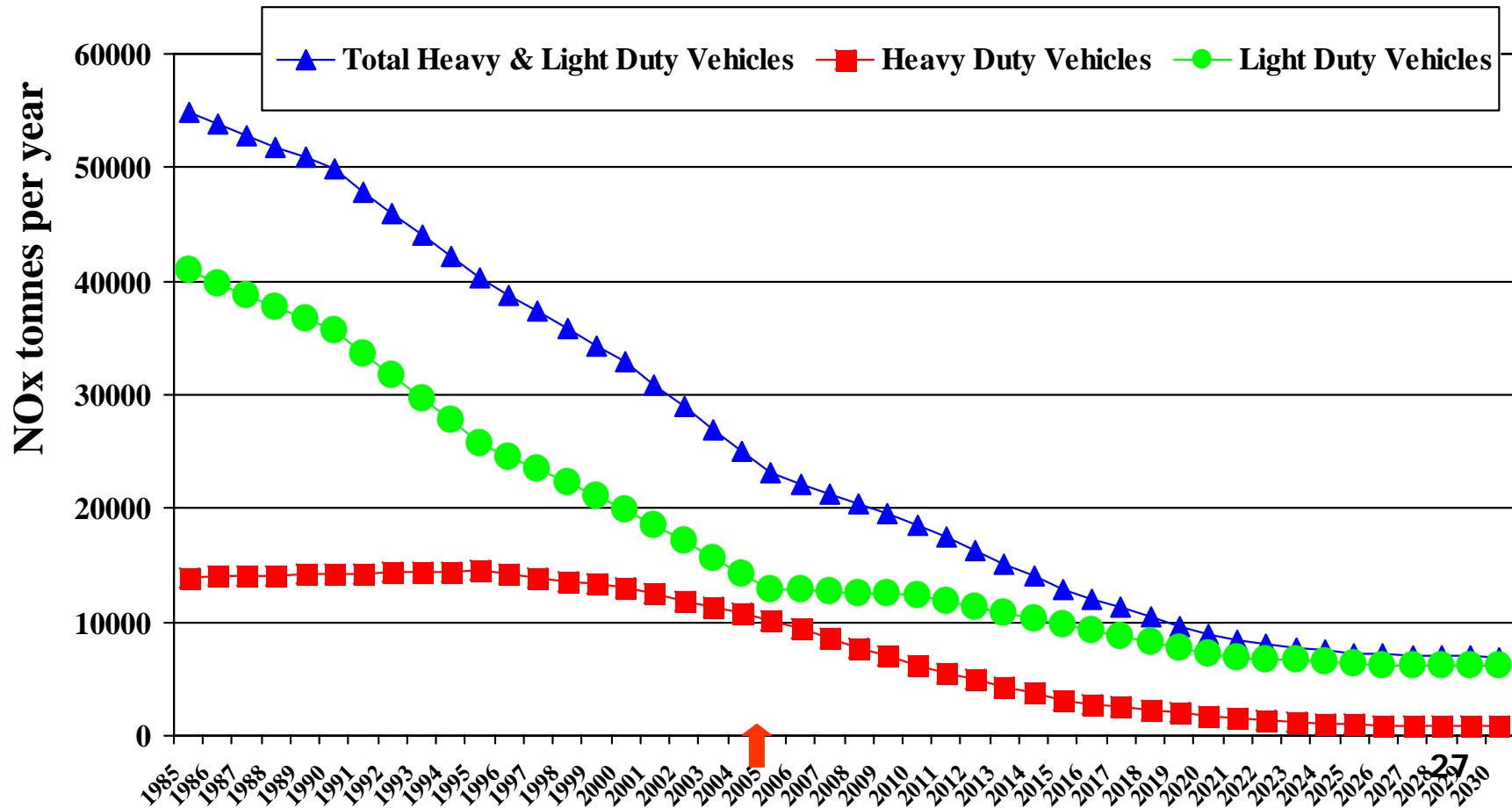
* (Includes direct sulphate and non-sulphate PM exhaust emissions)

On-Road Vehicle Emission Inventories for 1985 - 2030

NOx Emissions - Lower Fraser Valley

% Reduction:

(1985 - 2030) ⇒ 87% (2005 - 2030) ⇒ 70%

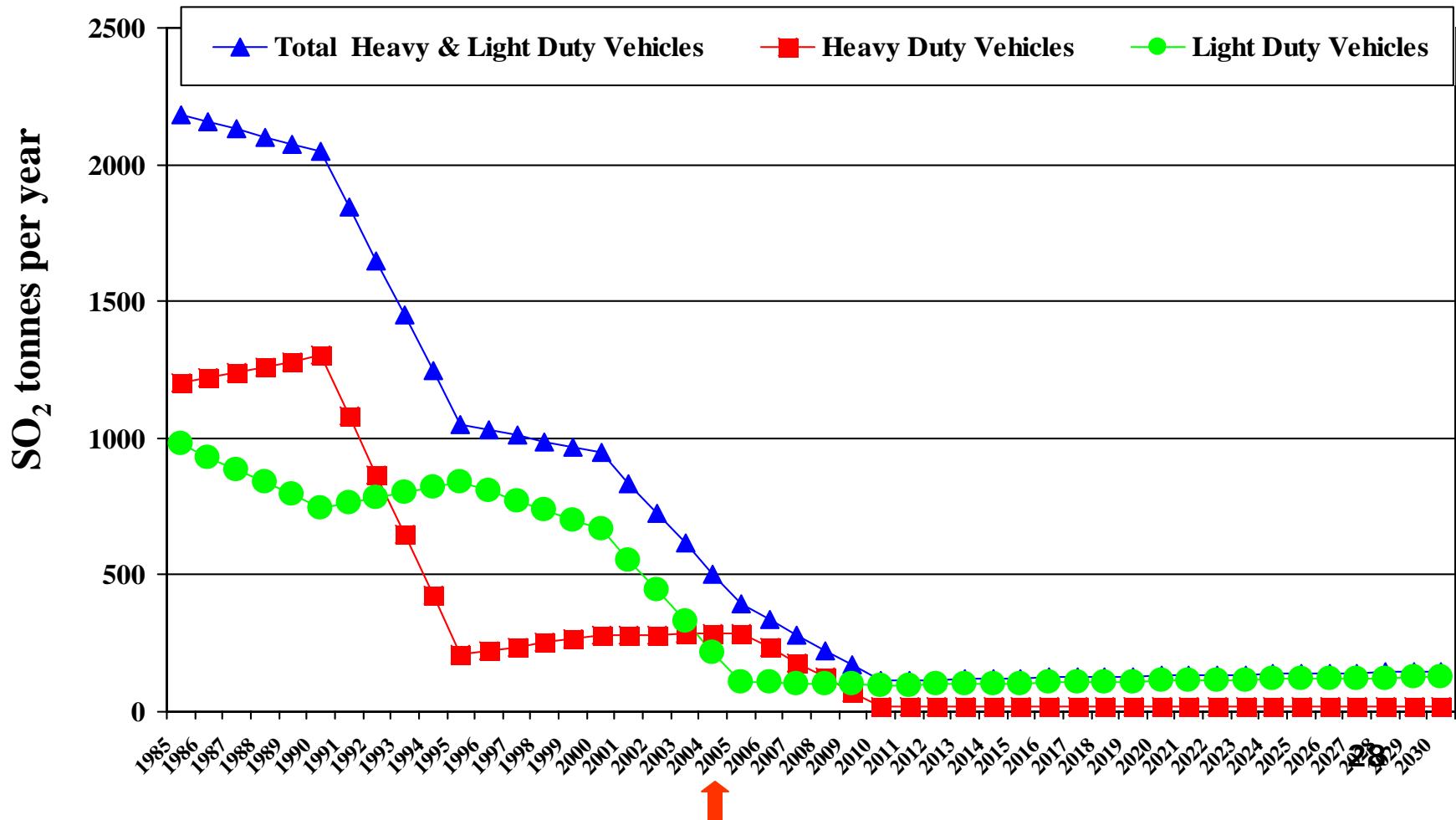


On-Road Vehicle Emission Inventories for 1985 - 2030

SO₂ Emissions - Lower Fraser Valley

% Reduction:

(1985 - 2030) ⇒ 93% (2005 - 2030) ⇒ 63%

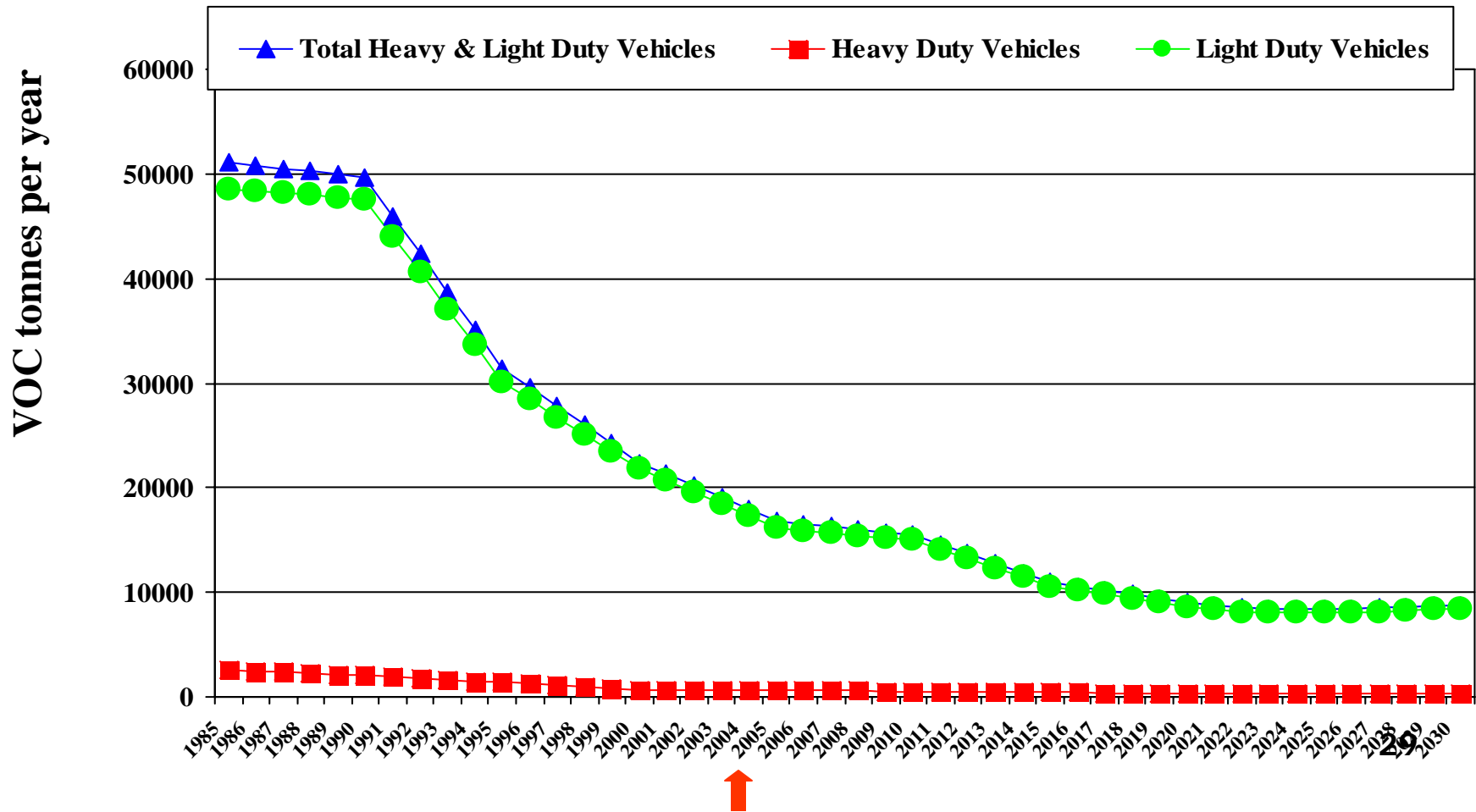


On-Road Vehicle Emission Inventories for 1985 - 2030

VOC Emissions - Lower Fraser Valley

% Reduction:

(1985 - 2030) ⇒ 83% **(2005 - 2030) ⇒ 48%**



On-Road Vehicle Emission Inventories for 1985 - 2030

CO Emissions - Lower Fraser Valley

% Reduction:

(1985 - 2030) ⇒ 64% **(2005 - 2030) ⇒ 0%**

