General Motors of Canada Limited

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Oshawa, Ontario
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October 9, 1997

Ms. Sue Kirby
Director General, Energy Policy Branch
Natural Resources Canada
580 Booth St., 19th floor
Ottawa, Ontario
K1A 0E4

Dear Ms. Kirby:

Subject: 1227 General Motors of Canada Limited - Action Plan Update

Please find enclosed the 1997 General Motors of Canada Limited - Action Plan Update. Also enclosed, please find an electronic copy (Microsoft Word Version 6.0c format) on disc.

This update contains energy consumption, greenhouse gas emission and energy conservation initiative information for the 1990 to 1996 period. This update compliments our original Action Plan as submitted in November, 1995, and our first update submitted in December, 1996.

We recognize that the "Tier Two" Action Plan requirements are still in draft form, but we have, nonetheless, taken every possible step to ensure that this update conforms to that standard. We have not included detailed projections of future energy consumption and GHG emissions. In view of the globally competitive nature of our business, and based on our support for the government's intention that all VCR information be made widely available, we do not believe it is in the best interest of our business, or the livelihoods of our employees, to incorporate projections. As a result, we feel that our participation should be recognized as "Tier Two", should the Tier Two Action Plan be implemented in the coming months.

Please contact me at (905) 644-1996 or via facsimile at (905) 644-3830 with any questions.

Sincerely,

Bryan Swift
Manager,
Government Relations

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Introduction

General Motors of Canada Limited (GMCL) is Canada's largest industrial manufacturer and largest exporter with a workforce of 30,000 employees across Canada. With 1996 calendar year assembly production of 753,033 vehicles.

Manufacturing Operations

Oshawa, Ontario

Car Assembly Plants - Chevrolet Lumina sedans, Monte Carlo coupes, Buick Century and Regal sedans

Truck Assembly Plant - GMC and Chevrolet extended cab version of the full-size, two-wheel and four-wheel drive pickup trucks

South Fabrication Plants - Batteries, suspension components, exterior sheet metal stampings

Ste. Therese, Quebec

Car Assembly Plant - Chevrolet Camaro coupes and convertibles; Pontiac Firebird, coupes and convertibles

St. Catharines, Ontario

Engine Plant - 5.0L and 5.7L V-8 engines and 3AL DOHC V-6 engines

Components Plant - Transmission final drive and differential assemblies, real axles, front suspensions, brake and drum assemblies and components

Windsor, Ontario

Transmission Plant - Four-speed electronic, front-wheel drive automatic transmissions

London, Ontario

Diesel Division - Diesel locomotives and light armoured vehicles (LAVs)

Commitment to the Environment

"The goal of improved environmental quality around the world is one we share with many. The public - and our employees, dealers and suppliers - expect us to be accountable to the environment. It's part of being in business. It's the responsible thing to do.

The linkage of environmental responsibility to our business is clear. Quite simply, environmental success is critical to our business success. GM's environmental initiatives are driven by the GM Environmental Principles that serve as our philosophy with regard to the environment. They build on past successes - and opportunities - and look to the future.

Our focus remains to demonstrate our commitment to the environment and sustainable development through all of our actions worldwide."

V. Maureen Kempston Darkes
President and General Manager
General Motors of Canada Ltd.

General Motors Environmental Principles

As a responsible corporate citizen, General Motors is dedicated to protecting human health, natural resources and the global environment. This dedication reaches further than compliance with the law to encompass the integration of sound environmental practices into our business decisions.

The following environmental principles provide guidance to General Motors personnel worldwide in the conduct of their daily business practices:

- We are committed to actions to restore and preserve the environment
- We are committed to reducing waste and pollutants, conserving resources and recycling materials at every stage of the product life cycle
- We will continue to participate actively in educating the public regarding environmental conservation
- We will pursue vigorously the development and implementation of technologies for minimizing pollutant emissions
- We will continue to work with all governmental entities for the development of technically sound and financially responsible environmental regulations
- We will continually assess the impact of our plants and products on the environment and the communities in which we live and operate with a goal of continuous improvement.

The CERES Principles

In February 1994, GM became the first mainstream "Fortune 50" company to endorse a set of environmental principles as developed by the Coalition of Environmental Responsible Economies (CERES). CERES is composed of national environmental groups and socially responsible investors. By endorsing the CERES Principles, GM publicly affirmed not only our commitment to the environment but also the accountability for corporate performance. CERES endorsed GM's Environmental Principles as consistent with the goals of the CERES Principles.

We now annually issue a Corporate Environmental Report (including specific information relating to the activities of General Motors of Canada Limited) that follows the CERES report protocol. Our investment in issuing an annual report facilitates internal evaluation of environmental performance, increases employee awareness of GM`s environmental issues, and promotes open discussion with the public on environmental performance.

As a leader of the Canadian automotive manufacturing industry and as a responsible corporate citizen, General Motors of Canada is dedicated to protecting human health, natural resources and the global environment.

GM's quest for continuous improvement has encompassed more than three decades of environmental policy. Throughout GM, our employees continue to use their talents to better understand how our business and our products affect the environment. We're working hard to identify the environmental challenges and develop solutions.

VCR Action Plan Update

This report represents our second update, with data compiled for the 1996 calendar year.

Energy Use in Our Facilities

Energy use in our manufacturing, testing and office facilities is a function of a number of factors, the capacity utilization of each facility, the age and efficiency of the facility and weather conditions. GMCL facilities throughout Canada primarily utilize the following forms of energy: natural gas, coal, fuel oil and electricity. We reported both the aggregate level of annual energy consumption and GHG emissions from our facilities over the period 1990-1996.

The only GHG generated from stationary sources is CO_2 CH_4 and N_2O are emitted from our waste water treatment facilities in a very small, non-significant amount. Our emissions estimates cover 10 facilities located throughout Ontario and Quebec, and excludes joint ventures (CAMI, Ingersoll, Ontario) and small owned or leased offices.

Methodology

Since GMCL facilities do not directly measure CO_2 emissions, standard emission conversion factors of CO_2 for each utilized form of energy are used. For electricity, CO_2 avoidance was calculated based on kilo-watt hours saved through energy efficiency and conservation efforts tracked since 1990.

Energy Consumption Mix

Total energy consumption for GMCL Or the 1990-1996 period are presented below on Chart 1. Total energy consumption over this period has decreased by 34%.

Note: Scarborough Van Plant was closed at the end of 1993, and the St. Catharine foundry was closed at the end of 1995.

CHART 1:

Energy consumption Mix

Vehicle Assembly Production

Assembly operations account for over 70% of GMCL's energy consumption. How these operations perform on a consumption per unit basis is an essential indicator of our overall energy consumption performance. Chart 2 presents annual vehicle production .

CHART 2:

Vehicle Assembly Production

Energy Consumption Per Vehicle Produced

Energy consumption per vehicle produced data for our assembly operations is presented below in Chart 3. Two significant interruptions in 1996 caused a reduction in units produced. Because the assembly facilities still consume some energy when they are on standby during an interruption, there was some deterioration of the 1996 consumption per vehicle figures relative to 1995. Nonetheless, average consumption per vehicle for the period 1990-1996 is down 8.4%.

CHART 3:

Energy Consumption Per Vehicle Produced

Stationary CO_2 Generation

GMCL facilities on site generation of CO_2 in 1996, represented a 23.9% decrease in CO_2 emissions from the 1990 baseline. CO_2 emission data is presented below on Chart 4.

CHART 4:

CO_2 On-Site Generation

KWh Saved and CO_2 Emissions Avoided (Cumulative)

Cumulative CO_2 generation avoidance as described on Page 4 of this document under "Methodology" is presented in Chart 5.

CHART 5:

CO_2 Emissions Avoided KWh Saved (Cumulative)

Energy Conservation Initiatives in GMCL Facilities and Future Projections

GM continues to search for new ways to reduce energy consumption, driven by the combined incentive of reducing both production costs and environmental impact of our operations.

Over the past year, engineers at our facilities have completed numerous energy conservation projects, designed to reduce consumption of electricity or powerhouse fuels such as coal or natural gas. These initiatives are summarized in Appendix #1. Appendix #2 summarizes energy conservation initiatives that our plants have forecasted for completion over the next few years. There are still many more initiatives that are being investigated for their environmental impact and their economic viability.

The highly competitive and global nature of the automobile industry prevents us from publishing detailed projections of future energy consumption and GHG emissions. Facility emissions are tied directly to production. If production increases, energy consumption and therefore emissions, will increase. Factors affecting our production plans include consumer demand for automobiles, consumer preference (i.e. between makes, models, size and fuel efficiency), and competition for product allocation. GMCL is working to ensure that total energy consumption, and generation of greenhouse gases, remain below 1990 levels. To ensure our global competitiveness we believe this is particularly important with respect to the per vehicle produced basis. Year to date production and energy consumption for 1997 indicates that we will remain well below 1990 energy consumption and GHG emission levels. Looking forward, significant model changeover activity is expected to reduce production, energy consumption and GHG emissions from 1997 levels for the 1998 calendar year.

Working With Our Suppliers

PICOS^{TM} is a GM Supplier Development Program designed to help suppliers achieve the goals of improving quality, service and price. A comprehensive PICOS TM environmental resource package has been developed for our Canadian supplier base. This package is designed to help our suppliers improve environmental performance while becoming even more profitable and productive. The package is currently being piloted with four suppliers. As our Supplier Development Engineers conduct workshops at supplier facilities across the country, they assist the suppliers in identifying opportunities to improve energy efficiency, in improving materials utilization, and in reducing pollution.

Employee Awareness and Education

While our leadership are committed to continuing reductions in energy consumption and CO_2 emissions, we need the active involvement of every member of our workforce to achieve the maximum reductions possible. Accordingly, GMCL continues to undertake a wide range of initiatives to promote awareness for energy conservation with our engineers and general employee population. Our engineers responsible for energy programs attend regular workshops, meetings and seminars, and receive a quarterly internal newsletter which serves to communicate success stories and focus attention on specific initiatives. They also attend an annual conference where energy coordinators from across Canada meet and exchange ideas.

This year each energy coordinator has been actively involved in the development of this report, providing consumption data and developing energy initiative communication forms. Regular meetings with our environmental and energy coordinators were used to raise awareness for the VCR program within our technical community.

All employees continue to gain awareness for our energy conservation efforts through our annual "Energy Awareness Week". Displays and newsletter articles serve to remind each employee of their responsibility to demonstrate leadership on this issue, both at work and at home.

An update on our involvement in the VCR program will be provided to employees in our Fall edition of GM Today. This magazine is sent directly to the homes of all our current and retired employees, as well as all our car and truck dealerships.

Finally, all employees will be invited to contact the energy coordinator in their facility if they would like to look at, or discuss, our VCR submissions. They will also be directed to the Natural Resources Canada VCR website, and the GMCL website, for more information.

The Climate Change Issue

The issue of climate change is one environmental challenge that is receiving intense review among industrialized nations as they prepare for discussions in Kyoto, Japan in December, 1997.

The Kyoto meeting is an outgrowth of the 1990 United Nations treaty known as the "Framework Convention on Climate Change" that was signed at the 1992 Earth Summit in Rio. The treaty committed the signing nations to undertake best-efforts to stabilize their manmade greenhouse gas (GHG) emissions at 1990 levels by the year 2000. Few if any, of the countries ratifying the agreement will actually be able to completely satisfy their year 2000 goals.

Efforts have continued to evolve the agreement - the resulting Berlin mandate established a process to set targets and timetables for control of GHG emissions for developed countries after the year 2000. Further discussion on these targets is the subject of the Kyoto meeting in December.

The Kyoto discussions and negotiations will be particularly difficult for the Canadian government. Canada's economy is more vulnerable to the effects of applied targets and timetables than the economies of other developed nations because:

- Canada's economy is more energy-intensive than most developed countries. Exports drive our economy, and are generally more energy intensive products. Our exports are particularly vulnerable to aggressive targets and short timetables.

- Canada's geography, climate and population growth, creates more demand for energy and energy services, relative to other developed countries.

- Our energy mix is less carbon-intensive than other developed countries. Relatively inexpensive greenhouse gas reduction opportunities, such as fuel substitution, are not as readily available in Canada.

In order to ensure that this impact is equitable and practical, we must work towards solutions that take a total systems approach.

Canada's Contribution to Global GHG Emissions: For Canada, at total systems approach must recognize that as a nation we contribute only 2% of the world's carbon dioxide (CO_2) emissions. While we recognize the need to address CO_2 emissions, we must keep Canada's contribution in perspective.

Canada's Contribution to the World's Carbon Dioxide (CO_2)

Over the period from 1990-2020, CO_2 emissions from the Developing Countries are expected to increase by 137%, raising their contribution to global CO_2 emissions to 69%. Therefore, any balanced approach to addressing climate change must include both developed and developing countries.

Projected Increased Importance of Developing Countries

Economic Aspects of Climate Change: The climate change issue must also be examined from an economic perspective. Current stabilization and reduction proposals could have a dramatic negative impact on some regions and countries. Canada, because of its geography, weather, and energy intensive nature of its exports, could be particularly hard-hit by the current proposals. Canada's situation highlights the need for flexibility in approach from country to country, and region to region.

Potential Negative Impact on GDP of Stabilization Proposal

2030 GDP Losses for G-7 Countries Using Reduction Proposal

Components of Canada's GHG Emissions: Canada's gasoline and diesel autos and light duty trucks are responsible for only 14.7% of our country's GHG emissions. This represents less than half of one percent of the global GHG emissions. A balanced approach for Canada needs emissions from all significant sectors to be addressed.

Cars & Light Duty Trucks Represent 14.7% of Canada's GHGs in 1995

GHG Emissions From Our Products: GM has made significant achievements in the area of Fuel Consumption. Canadian on-road vehicle stock fuel consumption has improved 8% since 1990. Technology improvements for better fuel efficiency have included:

- Vehicle weight reductions
- Tire technology
- Fuel handling (injection) and combustion improvements
- Friction reduction (lubricants, engine internals, brakes)
- Transmission efficiencies, and
- Vehicle aerodynamic improvements

Significant Achievement by Automotive Industry

GM is further involved in other related research and development initiatives such as:

- Alternative Fuels
- Fuel Cells
- Hybrids, and
- Manufacturing Innovations

The "Take Back" Effect: While vehicle manufacturers have made significant fuel consumption improvements, these more fuel efficient vehicles and low relative fuel prices cause customers to drive more.

Fuel Pricing Is Part of the Balance

As Vehicles Become More Efficient - They Are Driven Further

The "take back" effect refers to customers offsetting improved vehicle fuel efficiency by choosing to drive more. Fuel efficiency technology provided by vehicle manufacturers, alone could decrease CO_2 emissions by 8% in the year 2000 from 1990 levels (constant Vehicle Kilometers Travelled (VKT). However, with more people driving and the lower cost of driving per kilometer, consumers are driving more which in turn increases CO_2 emissions.

Fuel Efficiency Is Part of the Balance

Balanced Systems Approach: GMCL is committed to continuing to reduce tailpipe emissions and to improving fuel efficiency, but it is clear that a balanced systems approach to addressing CO_2 emissions from the transportation industry must address:

- **Transportation infrastructure**: Land use, urban planning, road structure, public transit.
- **Market demand**: Utility, performance, safety, city vs. highway driving.
- **Vehicle kilometers traveled**
- **Traffic management**
- **Fuel pricing**
- **Fuel efficiency**
- **Fuel Formulations and Supply**: Compatible fuel formulations for high technology emissions equipment, optimum oxygenate blends and efficient refining as well as a blending of the octane pool (regular/premium) to match vehicle requirements with optimum energy production requirements. This can potentially reduce emissions by 1-1.5%.
- **Inspection and Maintenance Programs**: Ensure that vehicles are operated as designed with emissions controls functioning as intended. Studies conducted by the U.S. Environmental Protection Agency have suggested that vehicles which have been repaired under an approved emissions inspection and maintenance program may improve fuel efficiency by 7-15%.