

# Ontario Crossroad into the Future

## *Emerging Issues in the Automotive Sector*

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## **Abstract**

The automotive industry faces emerging challenges due to a number of issues including climate change, oil peaks, and carbon-constrained markets. Existing government policy does not adequately push the automotive sector to advance beyond business-as-usual practices. This goes against the observed changes in global market demands that are increasingly favouring high-efficiency. Based on the experiences of other governments, it is clear that regulating fuel efficiency standards is an effective policy measure to achieve conservationist progress. However, accounting for the long-term sustainability of economic, social and environmental wellbeing requires more extensive research involving simultaneous consideration of complex future projections as well as existing realities. Such research must incorporate expertise from both government and the automotive sector. Early action towards improving Ontario's automotive practices is highly favourable.

## **1.0 Introduction**

Public policy faces escalating challenges imposed by issues that materialize outside the scope of government influence. In terms of economics, this is partly due to the “interdependence” of trade transactions across jurisdictions (Reinicke’s 1998, p.55). As Reinicke’s (1998, p.65) explains, the increasing dependence of domestic affairs on external factors threatens the “operational internal sovereignty” of government (i.e. its capacity to effectively enforce public policy), since the spatial boundaries of economic activity performed by the private sector are no longer coincident with the boundaries within which governments could legally operate. As a result, public policy cannot act inclusively, even though government “remains the principal centre of political and economic power as well as the locus of decisionmaking” (Reinicke’s 1998, p.55, 65).

The externalities imposed by the asymmetric nature of public versus private influence are further complicated by the emergence of multifaceted global issues such as climate change and Peak Oil. The scientists, economists, and policy makers that convey these emerging issues demonstrate extensive consequential emergencies that could have substantial social and economic costs (Brown 2006; Flannery 2006; Intergovernmental Panel on Climate Change – IPCC 2007; Stern 2006). When viewed from the lens of government responsibility, and by factoring-in the inherent – and sometimes conflicting – pressures from the corporate sector and the electorate, these issues translate into a complex system of external and internal forces that constitute a highly contentious and problematic public policy formulation environment.

The purpose of this paper is to offer policy proposals for the Government of Ontario regarding the regulation and subsidy of Ontario’s automotive industry. The focus of analysis is to contextualize the long-term challenges facing the industry beyond the common, supply-

and-demand market perception by exploring – from a governmental perspective – the *economic* implications of climate change and oil peaks on the industry’s future prospects. The paper is structured in three main segments. First, an overview of the automotive sector is presented to introduce important aspects of the industry including its history, economic status, and the governmental regulations under which it operates. Then four emerging issues that emphasize critical factors threatening the long-term sustainability of the industry’s growth are explored. Finally, policy proposals are offered in consideration of the overall discussion and findings. Existing Ontario policies and initiatives are systematically examined along the course of discussion.

## **2.0 Industry Backgrounder**

“The foundation of Canada’s automotive industry is the Canada-United States Automotive Products Trade Agreement, or Auto Pact, which was established in 1965 and integrated the automotive markets in Canada and the U.S... [The] Auto Pact acted as a strong incentive to begin production in Canada to save on tariffs... In October 1999, the World Trade Organization (WTO) ruled that the Auto Pact constituted a barrier to trade. As a result, Canada has commenced, as of February 2001, phasing out all remaining facets of the Auto Pact. Notwithstanding its initial importance to the industry, the end of the agreement is expected to have little impact on the sector, given the Canadian industry’s general competitiveness and favorable access to North American markets through NAFTA.” – Charles River Associates (CRA 2001, p.7,8)

### **2.1 Economic Status**

Ontario contains more than 90% of Canada’s automotive industry (Canadian News Wire – CNW 2008). According to the Canadian Automotive Partnership Council (CAPC 2007), the industry produces more than 2.5 million light-duty vehicles every year, which makes Ontario the “leading jurisdiction for auto production in North America and the 10<sup>th</sup> largest globally.” The sector accounts for approximately 5% of Ontario’s gross domestic product (GDP) and 2% of Canada’s GDP; contributes over \$10 billion in tax revenue to all levels of government; exports about \$100 billion annually; and employs about 130,000 Ontarians. It offers an average annual salary of \$72,000, and has an average employment

period of 8.8 years for full time manufacturing employees. Approximately 85% of its production is exported to the U.S. (CAPC 2007; CNW 2008; Oliver 2007, p.6; Ontario Investment and Trade Centre – OITC 2008a).

According to OITC (2006, p.2), the industry constantly attracts new investors, with an average annual investment of \$2.6 billion over the last ten years. Its main production mix is “heavily weighted towards “core products” such as midsize to large cars, pickup trucks, and vans for which, barring severe energy shocks, demand is likely to remain relatively stable” (CRA 2004, p.4). All sources – which include the Government of Ontario; CAPC; Pollution Probe (an environmental organization); and CRA (a business consulting firm) – acknowledge the valuable social and economic benefits of the automotive industry in Ontario and in Canada (CAPC 2007; CNW 2008; OITC 2008a; Oliver 2007, p.6). However, the assessment of the sector is debatable in terms of fuel-efficiency standards and the long-term economic sustainability of its social benefits.

## **2.2 Fuel-Efficiency Standards and Regulations**

In 1982, the Canadian Parliament passed the *Motor Vehicle Fuel Consumption Standards Act* (MVFCSA) as a step towards establishing legislation to set fuel consumption standards for certain types of vehicles (Transport Canada 2007). However, as explained by Transport Canada, the Act was not proclaimed at the time based on a voluntary commitment by automotive manufacturers to continue to follow the U.S. Corporate Average Fuel Economy (CAFE) standards (see Appendix II for more information). According to Transport Canada, the commitment was “broadly consistent with the framework and authorities established by the MVCSA.” In 2005, the automotive industry agreed to “take actions to *voluntarily* reduce GHG emissions of new vehicles” (emphasis added) by 5.3 megatonnes by

2010. The government recently decided to enforce one national *mandatory* standard by proclaiming the MVFCSA in 2007. The standard will be developed for 2011 vehicle model year. (Transport Canada 2007)

The Government of Ontario does not enforce mandatory fuel-efficiency standards on the automotive production. However, it plans to develop “a harmonized, continental approach to vehicle fuel-efficiency standards; ... [and] a continental low carbon fuel standard” as a way of reducing provincial greenhouse gas (GHG) emissions (Go Green Ontario 2007a, p.10). Ontario has a sales tax that was introduced in 1992 – Tax for Fuel Conservation (TFFC) – on sport utility and passenger vehicles. TFFC is based on a consumption threshold of 6.0 litres per 100 km (see Appendix I), and consumers are eligible for a \$100 rebate on the retail sales tax of a car purchase below this threshold (Conservation Council of Ontario 2008; Ministry of Revenue 2008).

These policy measures are analysed in Policy Proposals; section 4.2.

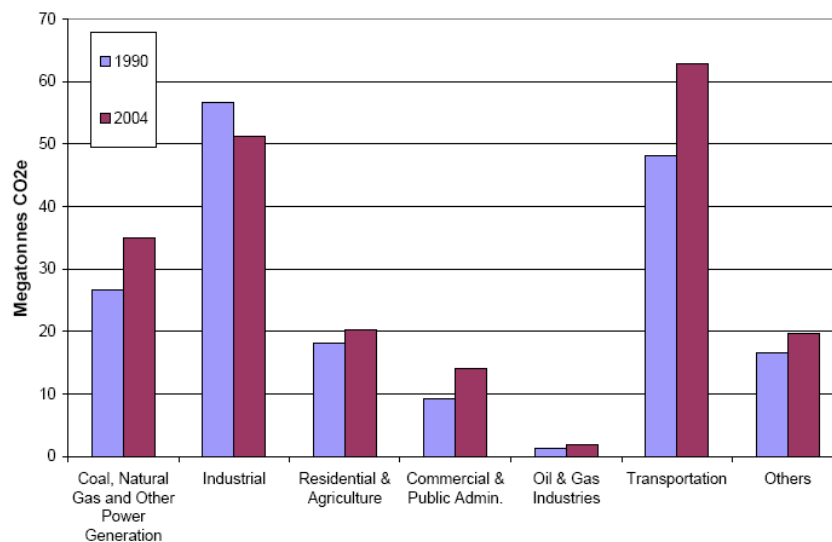
### **2.3 Provincial Subsidy**

In 2004, Ontario introduced a 5-year \$500 million program – *Ontario Automotive Investment Strategy* (OAIS) – in order to subsidize “large-scale capital projects that contribute to the long-term competitiveness of the automotive industry” (OITC 2008b). The Ministry of Economic Development and Trade (2004) specifies that projects must “be worth more than \$300 million in investment, or [ ] create or retain more than 300 jobs” to be eligible for OAIS. The program also requires projects to include “energy efficiencies and environmental technologies.” However, the Ministry does not specify efficiency standards, or guidelines concerning the “environmental” technologies.

### 3.0 Emerging Issues in the Automotive Sector

#### 3.1 Climate Change

The Intergovernmental Panel on Climate Change (IPCC 2007) identifies a wide range of current and future consequences – with varying degrees of certainty – due to climate change<sup>1</sup>. These consequences are expected to have serious impacts on ecosystems; societal settlements; food and water supply; human health; and industry (IPCC 2007, p.48-54). Stern (2006, p.6) projects “major disruption to economic and social activity, on a scale similar to those associated with the great wars and the economic depression of the first half of the 20<sup>th</sup> century.” Anthropogenic climate change is commonly understood to be due to GHG emissions that have been a ubiquitous end-product of human development since the industrial revolution (IPCC 2007, p.36-41). These emissions are believed to be speeding up the natural climate change process beyond the adaptive capacity of Earth’s ecosystems, which could trigger crises affecting virtually every aspect of human life (Flannery 2006).

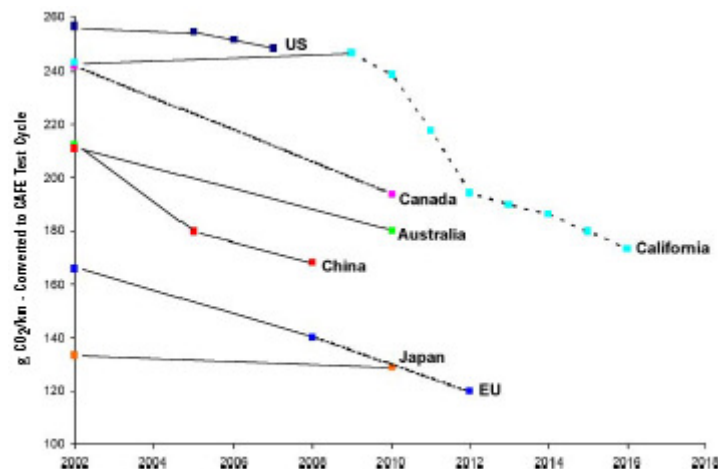


**Figure 1:** By sector GHG emissions in Ontario in 1990 and 2004 (Go Green Ontario 2007a, p.3)

<sup>1</sup> “Climate change in IPCC usage refers to a change in the state of the climate that can be identified (e.g. using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. It refers to any change in climate over time, whether due to natural variability or as a result of human activity” (IPCC 2007, p.30).



Transport has been identified as one of the main causes of anthropogenic climate change, contributing to 13.1% of global GHG emissions (IPCC 2007, p.36). In Canada, 26.8% of GHGs come from the transportation sector, which is a 32.8% rise in 2005 from 1990 levels (Environment Canada 2008). In Ontario, transportation contributes to more than 30% of total emissions and represents both the largest and fastest growing source of GHGs in the province (Figure 1, Go Green Ontario 2007b). According to Via Rail Canada (2008), “50% of personal GHG emissions come from private cars.” In the Greater Toronto Area (GTA) alone, “residents made approximately 10 million car trips per day in 2004 and were responsible for approximately 14 million tonnes of carbon dioxide emissions” (Office of the Premier, 2007).



Note: dotted lines denote proposed standards

**Figure 2:** GHG emission rates in different jurisdictions (An and Sauer 2004, p.26).

According to An and Sauer (2004, p.1), Canadian and U.S. vehicles emit the most GHGs compared to other regions (Figure 2). In addition, Magnusson (2005) states that SUV production is one of the “largest and fastest growing market segments in North America.” Despite the economic benefits of this growing market, according to Magnusson, SUVs emit 36% more GHG than small cars (B.C. Ministry of Environment 2008). In 2004, Canada’s SUV production had increased by 9 times since 1999 – from 2% to 18% of total light-duty vehicle manufacturing (Magnusson 2005).

While some climatic changes are already being manifested, the gravity of climate change is generally anticipated to materialize in future years with accelerating impacts (Flannery 2006, p153-165). The issue's causes and effects also differ by region. For example, while many countries in Africa are expected to suffer severe water and agricultural shortages by 2020, North America is projected to increase its "aggregate yields of rain-fed agriculture by 5% to 20%" in the short-term (IPCC 2007, p.50-52). Considering that an estimated 19.7% of the global population located in the industrialized world is responsible for 44.6% of global GHG emissions<sup>2</sup> (IPCC 2007, p.37), the disparity and ethics associated with the issue come into perspective. By factoring-in the inherent uncertainty (i.e. risk) of climatic projections, it becomes clear why a traditional supply-and-demand outlook for GHG-emitting products and services cannot account for the complex impacts of the crisis<sup>3</sup>.

### 3.2 Peak Oil

"The first [oil] wells were drilled [ ] in the mid 19th Century...The Industrial Revolution was already in progress being driven by the steam engine, fuelled by coal. But then in the 1860s, a German engineer found a way to insert the fuel directly into the cylinder inventing the Internal Combustion Engine, which was much more efficient...[This led] to [ ] rapid expansion... without necessarily recognizing that the expansion was driven by an abundant supply of cheap largely oil-based energy." – Colin Campbell (2008)

According to Campbell, *Peak Oil* "refers to the maximum rate [i.e. peak] of the production of oil in any area under consideration, recognising that it is a finite natural resource, subject to depletion<sup>4</sup>." Campbell explains that peak occurs when approximately half the oil in a given reserve had been extracted. He adds that many important producers have already peaked, which suggests that world peak "is now imminent." (2008)

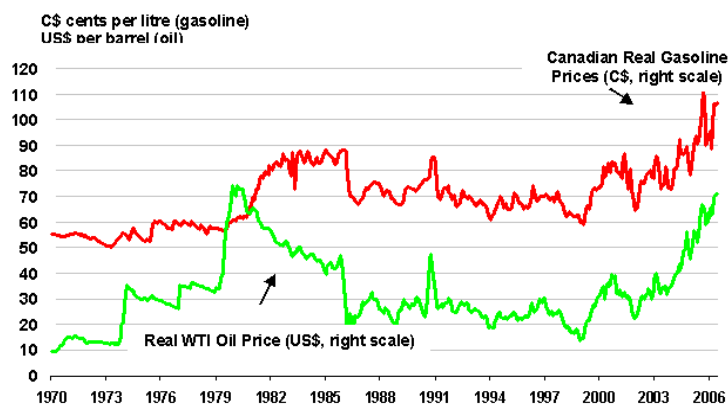
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<sup>2</sup> This excludes Brazil, China and India, which – based on 1994 measures – were collectively responsible for 23% of global emissions. Emissions in these emerging economies are on the rise (Centre for Clean Air Policy 2006, p.73).

<sup>3</sup> The Government of Ontario recognizes its global responsibility to reduce GHGs and has set targets to reduce Ontario's emissions by 6% by 2014 and 15% by 2020 (below 1990 levels). However, transportation initiatives are heavily weighed towards promoting public transit; while the automotive industry continues to lack mandatory standards in terms of fuel conservation (refer to section 2.2). (Go Green Ontario 2007a, p.2,7)

<sup>4</sup> According to Campbell (2008), current oil production comes from "two epochs of extreme global warming, 90 and 150 million years ago, when algae proliferated in the warm sunlit waters, and the organic remains were preserved in the stagnant depths to be converted to oil by chemical reactions... It follows that [oil is a] finite natural [resource] subject to depletion."

One consideration in Ontario’s case is that Canada is a large oil producer with potential for production growth (Brown 2006, p.22). However, the energy provisions under the North American Free Trade Agreement (NAFTA) ensure that Canada remains completely open to the North American energy market by prohibiting all forms of government intervention that would cause exports to decrease (Holden 2006). Thus, in the case of a global oil shortage – and considering the already high demand of the U.S. market for oil – Canada could still experience shortages despite its rich reserves<sup>5</sup> (Energy Information Administration – EIA 2008a,b; Holden 2006).

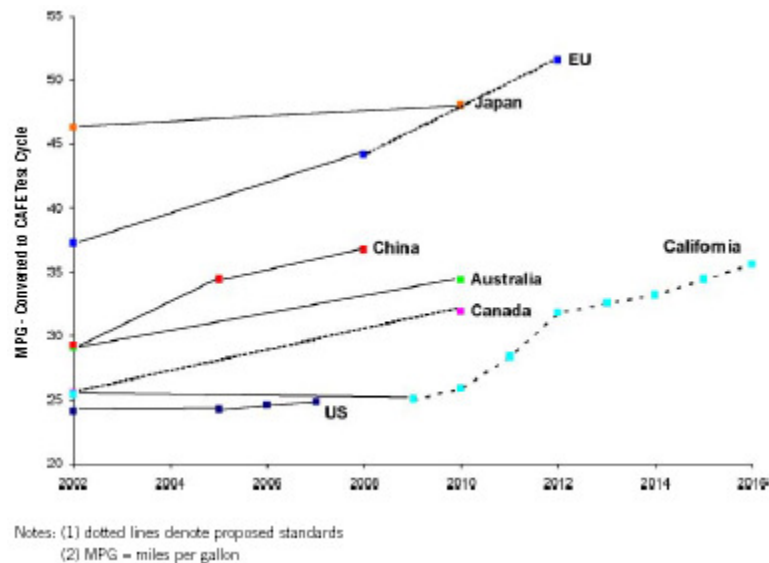


**Figure 3:** Gasoline and Oil Prices (Adjusted for Inflation) (source: Department of Finance Canada 2006)

The direct implications of depleting oil on traditional automotive production are evident, since oil is the primary resource used to fuel vehicles. According to Finance Canada (2006), “after adjusting for inflation, oil prices are nearing the record highs reached in the late 1970s” (see Figure 3). However, Peak Oil implies more extensive social and economic crises that are expected to affect nearly all aspects of modern life (i.e. food production, transportation, trade, industry, etc.) due to the dependency of modern society on the commodity (Brown 2006, p.21-40). This in turn translates to great urgency for government policy to prepare for numerous upcoming challenges. In Brown’s (2006, p.21) words, “adjusting to a shrinking oil supply is part of the economic restructuring needed to put the

<sup>5</sup> According to the U.S. Energy Information Administration (EIA 2008a), the U.S. is the world’s biggest oil consumer per capita. In addition, Canada is currently the top source of U.S. foreign supply, exporting 1.944 million barrels of crude oil and 2.586 million barrels of petroleum per day to the U.S. (EIA 2008b).

economy on a path that will sustain progress” (Brown 2006, p.21). In terms of automotives, this is a clear call for fuel-conservation measures.



**Figure 4:** Fuel economy standards in different jurisdictions – normalized by CAFE-converted mpg. Gasoline and Oil Prices (An and Sauer 2004, p.1, 25).

As Figure 4 demonstrates, Canada is among the “lowest standards in terms of fleet-average fuel economy rating” (An and Sauer 2004, p.1), which indicates that the automotive industry is lagging behind global trends in fuel conservation. Considering Canada’s high oil production, such low standards may not be an urgent concern in the short-term. However, NAFTA provisions; concern over energy security; and other externalities increase the need for conservation in order to prolong oil supplies.

Peak Oil is particularly problematic due to the general lack of specific information regarding the issue such as the “date of peak” or the “rate of subsequent decline” (Campbell 2008). In the absence of such information, governments lack the necessary requisites to accurately foresee the long-term implications of fuel policy. However, quoting Campbell (2008), “what matters — and matters greatly — is the vision of the long remorseless decline that comes into sight on the other side of [Peak Oil].”

### 3.3 Carbon-Constrained Markets

Of particular importance to the automotive industry is the way by which global markets are responding to the emerging issues discussed above. According to Oliver (2007, p.4), the EU implemented automotive standards to mitigate GHG emissions in response to climate change. The author argues – with reference to *The Economist's* 22/09/07 article by Charlemagne – that markets are following the EU as a “global regulatory leader,” which makes regulatory standards a source of “global competitiveness” (2007, p.13). As Figures 5 and 6 demonstrate, this is also shifting the global demand towards higher efficiency, except in North America.

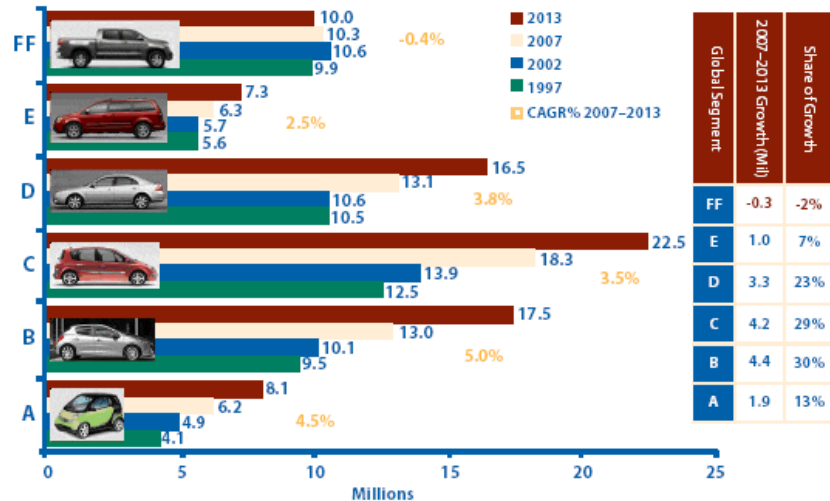


Figure 5: Global Outlook Production Trends by Segment (source: Oliver 2007, p.9)

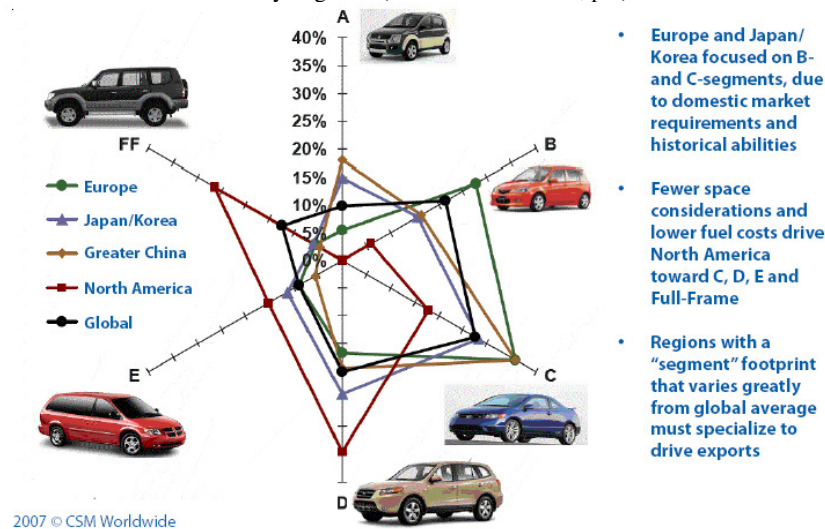


Figure 6: Global Outlook Production Trends by Major Region (source: Oliver 2007, p.9)

In Canada, however, the market shift is consistent with the global trend (i.e. favours higher efficiency), which, according to Oliver (2007, p.8-12) has stimulated the popularity of imported vehicles from more fuel efficient suppliers outside of North America. Although the writer is careful not to undermine the fact that a “substantial amount of Canada’s imports arrive from the US and Mexico” (2007, p.10). If Canadian drivers increase their demand for efficiency – which would be consistent with government plans to reduce GHGs (e.g., see Go Green Ontario 2007a) – Ontario’s automakers may risk shortfalls in domestic markets.

It is important to note, however, that 85% of Canadian automotive production is exported to the U.S. (CNW 2008). It follows that automakers depend mainly on U.S. demand in terms of trade. This is echoed in the consistent integration of Canada’s automotive policy with U.S. standards. For example, according to Transport Canada (2007), the 2011 MVFCSA standards will be “achievable within the integrated North American market, and [ ] benchmarked against a stringent, dominant North American standard” (Transport Canada 2007), which indicates that the forthcoming standard will depend on the agreement of the U.S. Given that U.S. standards are the lowest compared to other markets, and considering the increasing demand of the U.S. market for high-emission vehicles such as SUVs (Magnusson, 2005), following a U.S. benchmark may not be the most conservationist approach. In addition, Oliver (2007, p.9) argues that “Canada’s fuel consumption standards should require improvement against a Canadian baseline.”

The government’s approach emphasises the political sway that market demand has on policy decisions pertaining to the automotive industry. This is also reflected in Ontario’s rhetoric regarding automotive subsidies. For example, Minister Papatello announced that OASIS investments are what “help to keep [Ontario’s] industry strong and competitive,” with no reference to improved environmental standards (Ministry of Economic Development and

Trade 2006). Critics such as CRA (2001, p.125) draw attention to the importance of competitiveness – especially given Mexico’s emerging automotive industry and cheaper labour – and direct subsidies, but emphasise that Canada’s main challenge is to “pioneer” new technologies “with the potential to reduce material or other costs or to improve quality” in order to raise the competitive margin relative to “countries that currently base their cost advantage on low labour costs.” Considering the increasing global demand for high-efficiency, a conservationist orientation for the “new technologies” recommended by CRA would be a long-term investment, especially in the context of the future economic and social costs of climate change and oil peaks.

### **3.4 Government Policy**

Government policy confronts an escalating challenge of having to balance the interests of the private sector; the growing complexity of globalization (i.e. trade, international agreements, emerging issues with global consequences, externalities, etc.); and the present and future welfare of society. There are also factors to be considered in terms of existing market realities (i.e. demand, competition, etc) as well as technical and fiscal difficulties that add to the inherent challenges of changing the status quo.

This highlights an additional concern regarding government “awareness” of the specifics shaping the domain of public policy. Quoting Reinicke (1998, p.65), “information asymmetries have always been one reason why policy makers find it difficult to keep up with the changing nature of the marketplace.” He adds that the globalization of contemporary affairs “has led to a sharp increase in these asymmetries, making it almost impossible for governments to maintain even a minimum amount of crucial information.”

## 4.0 Policy Proposals

### 4.1 Knowing where we Stand

*Proposed to:* The Ontario Ministries of Economic Development and Trade; Energy; Environment; and Labour, in collaboration with industry.

*Summary of Proposal:* Conduct a research program in collaboration with the automotive industry in order to identify specific social, economic and environmental costs associated with emerging issues in Ontario's automotive sector.

#### *Policy Analysis*

The main purpose of the proposed research program is to mitigate the level of uncertainty (i.e. risk) facing society, government and the private sector due to climate change, oil peaks, and carbon-constrained markets. The study would thoroughly investigate multiple internal and external factors including: existing domestic/ international legislation; legislative changes in the U.S. pertaining to the automotive industry; a reasonable level of desired progress; the technical and fiscal feasibility of this progress; the anticipated social, economic, environmental and political costs of climate change in Ontario; future oil prices in North America; externalities; uncertainty; and other relevant factors according to the government and the automotive sector.

It is then recommended that the government identifies common grounds for the purpose of implementing mutually-acceptable policies that provide a reasonable balance between social, private and environmental interests. Collaboration with industry throughout the research and policy-making processes is essential to maintain constructive diplomatic ties with and a constant flow of information from automakers. It is also equally important for government to seek knowledge beyond the limitations of market expertise in order to establish a more complete picture of the challenges at hand.



## 4.2 Regulating Fuel Efficiency Standards

*Proposed to:* The Ontario Ministry of Transportation

*Summary of Proposal:* Set mandatory car efficiency standards based on an incremental plan, with strict deadlines, oriented towards catching up with EU standards.

### *Policy Analysis*

In terms of fuel efficiency, two main options are often discussed as potential motivators for more efficient vehicle production/supply. The first is enforcing a fuel tax – such as Ontario’s TFFC – hoping that higher fuel prices would increase the demand for higher efficiency, hence shifting the market towards more conservationist practices. The other option is to enforce regulatory fuel efficiency standards – such as the forthcoming MVFCSA – in order to force automakers to supply more efficient cars. (Oliver 2007, p.1-4)

Quoting Oliver, “generally speaking, increases in fuel prices have not translated into a corresponding increase in average new vehicle fuel efficiency levels or the use of technologies to reduce fuel consumption.” According to the author, this is consistent with the economic theory on fuel prices and fuel efficiency, where “demand for fuel efficiency-enhancing technology content in a new vehicle remains – at best – only part of a diffuse response to the price signal.” Oliver explains that in reality “consumers are unlikely to conduct an accurate cost-benefit analysis of fuel efficiency and probably attach little value to real fuel savings.” (2007, p.2,3)

Greene (2007, p.4) elaborates the same point by discussing “loss aversion” in consumer behaviour. The term, according to the prospect theory<sup>6</sup>, refers to the psychology of decision-making that involves risk, where “potential losses loom greater than relatively equal potential gains” (Byrns 2007). Translating this into the event of trading-off efficiency with

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<sup>6</sup> According to Byrns (2007), “Prospect theory is a collection of explanations for observed exceptions to standard economic assumptions: (a) that people’s preferences are orderly and conform to a general law of diminishing returns (strictly concave preferences, for those of a mathematical bent), and (b) that human behavior is “rational” in that choices can reasonably be expected to accomplish the decisionmaker’s goals.”

vehicle price, Green (2007, p.8) explains that consumers develop erroneous perceptions regarding the value of some vehicle-related elements that make “an expenditure on higher fuel economy a *risky bet*.” This can be explained based on the initial experiences of many European countries with fuel tax, where “opportunities to improve fuel efficiency were often traded off against increases in other vehicle attributes, such as horsepower, acceleration rate, speed and weight” (Oliver 2007, p.2). Since markets respond to consumer demand, and since consumers cannot adequately value the trade off for efficiency, the market “fails” to perceive the economic value of efficiency (Greene 2007, p.15; Oliver 2007, p.3).

The alternative policy option (i.e. enforcing fuel efficiency standards) has proven successful in the past. In the 1970s, the U.S. CAFE standards required automakers to double the fuel economy of their production over a 10-year period (Oliver 2007, p.1). According to Oliver, “this single measure... continues to save the U.S. 2.8 million barrels of oil per year [], reduces emissions by 100 megatonnes of carbon annually... [and has accumulated economic benefits] in the range of \$40 – \$80 billion in unadjusted dollars.” He adds that the automotive industry “continued to flourish under CAFE standards.” (2007, p.1)

The proposed regulatory standard selects the EU as a benchmark to ensure that Ontario’s industry is in line with the most progressive automakers, and responsive to Canadian demands for higher efficiency. However, there are two challenges associated with following EU regulation. First, it would likely be unfeasible for Canadian automakers to meet EU standards *and* deadlines, considering that the EU is already more advanced than Canada in terms of fuel efficiency (refer to Figures 2 and 4). For this reason, it is recommended that the government sets more lenient deadlines to allow automakers enough time to adjust to the proposed changes with little short-term economic costs. These deadlines would depend on input from industry to determine what is realistically achievable.

The second challenge – given that 85% of Canada’s production depends on U.S. demand – is fear of retaliation from the industry which would jeopardize Ontario’s market competitiveness and economic condition. This could arise if some automakers choose to avoid the costs of abiding by the proposed policy and relocate to a different jurisdiction. To prevent this problem, the government must commit to assisting the automotive industry with the costs required to advance the proposed policy.

### **4.3 Automotive-Transformation Fund**

*Proposed to:* The Ontario Ministries of Finance; Economic Development and Trade; and Research and Innovation

*Summary of Proposal:* Replace OAIS with a funding program with two primary focuses: 1. assist the automotive industry with upgrading vehicle efficiency based on EU standards; and 2. fund the research and development of alternative automotive technologies such as hybrid, solar and/or electric vehicles.

#### *Policy Analysis*

The main purpose of the first component of the proposed policy is to ensure that automakers do not bear the full financial burden of upgrading their production practices, hence mitigating any short-term setbacks to the competitive advantage of Ontario as an attractive jurisdiction for further investment. The second component of the policy is more aimed towards long-term progress and innovation of automotive practices. Given the province’s existing infrastructure and expertise in the automotive field, Ontario is well positioned for this type of investment. The current government is already heading in this direction through initiatives such as the *Ontario Fuel Cell Innovation Program (OFCIP)*, which aids the development and commercialization of fuel cells – an inherently conservationist technology<sup>7</sup> (Ministry of Research and Innovation 2008).

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<sup>7</sup> “A fuel cell combines hydrogen (which can be obtained from methanol, natural gas, petroleum or renewable sources) and oxygen (from air) without combustion to generate electricity” (Conservation Council of Ontario 2008). Ballard Power

OFCIP is a good start in the direction intended by the proposed policy. However, it is recommended that government invest in more large-scale, alternative technologies such as hybrid, solar and electric automobiles. Further research on the specific technicalities of alternative technologies is required to determine a reasonable *minimum* share of ATF for future research and development. This is to give automakers enough incentive to invest in long-term innovation.

The proposed ATF acknowledges the contributions of the automotive industry to Ontario's economic and social wellbeing, and recognizes that automotive pollution is a product of both industry and drivers (i.e. a large portion of tax payers). However, ATF raises a dilemma regarding the fairness of requiring non-drivers to subsidize the development of the automotive industry. It is only drivers that directly utilise automotive products and thus contribute to environmental pollution. Conversely, the automotive industry benefits all Ontarians through its overall contribution to the economic and social wellbeing of the province. The following proposal addresses this issue.

#### **4.4 Financing the Automotive-Transformation Fund**

*Proposed to:* The Ontario Ministry of Finance

*Summary of Proposal:* Set a fuel tax to help finance the proposed ATF in conjunction with traditional funds from Ontario's general tax revenue

##### *Policy Analysis*

The main concept here is similar to *tax-shifting*, which, according to Brown (2006, p.228), is a widely endorsed policy measure that advocates “lowering income taxes while raising levies on environmentally destructive activities.” The “environmentally destructive activity” being taxed here is fuel-consumption, and the “shifting” is applied through

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Systems – a Canadian world-leader, according to the Council – is already partnering with major automakers to commercialize fuel cells in the transportation sector.

preferential taxing. However, in this case, the proposed tax also takes into account the economically and socially “constructive” activities provided by the automotive sector.

The suggested tax would be fully billed to the automotive industry through the proposed ATF (refer to section 4.3) to relieve the financial burden from non-drivers, and ensure that subsidies are based on the level of a consumer’s contribution to environmental pollution. Germany enforces a similar measure to promote the economic competitiveness of its renewable energy sector by billing residents based on electricity consumption to subsidize operators of renewable energy plants (*Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit* – BMU 2006, p.2). Considering Ontario’s projected rise in population and vehicle sales, the proposed tax is likely to increase over the years, thus boosting the transformation of automotive practices as well as the competitiveness of the automotive industry.

The advantage to increasing existing provincial fuel tax is the potential of reducing the average car *use* in Ontario. This is different from car *sales* discussed in section 4.2, which means that the Canadian automotive market would not suffer. Conversely, raising tax is generally not a politically favourable initiative. An alternative option is to allocate a specific portion of existing provincial fuel tax to the proposed ATF<sup>8</sup>, or replace TFFC with ATF-tax.

To take into account the general social and economic benefits provided by the automotive industry to Ontarians, non-drivers would also subsidize the proposed ATF through provincial taxes. However, in this case the amount allocated to the industry would depend on the provisions of Ontario’s annual budget.

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<sup>8</sup> According to the Department of Finance Canada (2006), the 2006 provincial tax component of retail gas prices was 14.7% in Toronto, Ontario.

## 5.0 Concluding Remarks

In the early 1990s, the German Government decided to launch an extensive renewable energy policy with the following main objectives: 1. phase-out nuclear energy after the horrific consequences of the Chernobyl nuclear meltdown in 1986; 2. secure Germany's energy supply by reducing reliance on fossil fuels; 3. mitigate GHG emissions in order to act on climate change and meet international commitments under the Kyoto Protocol; and 4. develop technological expertise in the renewable energy field (BMU 2006, p.2; *Bundesverband WindEnergie – BWE* 2008; Zakzouk 2008, p.5-10). Based on 2004 records, – i.e. after approximately *14 years* of unwavering political endorsement for the renewable agenda – Germany is still considered the second largest producer of both nuclear and coal energy in the EU<sup>9</sup>, with higher than EU-average energy imports and a growing energy consumption<sup>10</sup>. (European Commission 2007, p.1; Zakzouk 2008, p.10-15)

This demonstrates the slow progress that is inherent to changing business-as-usual (BAU) practices. Nevertheless, Germany is now an acclaimed leader in renewable energy technology (and markets), with more GHG reductions than all EU-15 countries<sup>11</sup> (Feller 2004; Pew Center on Global Climate Change 2005, p.5; Zakzouk 2008; 10-15). In Ontario, the automotive industry is already well positioned to advance beyond BAU. Early action is strategic, considering that, sooner or later, change is required.

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<sup>9</sup> Based on 2004 records, Germany's domestic production consists of: 43% solid fuels, 32% nuclear, 11% gas, 10% renewable, and 4% oil (European Commission 2007, p.1).

<sup>10</sup> Germany's energy consumption increased by 30% from 1990 to 2004 (European Commission 2007, p.1)

<sup>11</sup> In 2001, Germany alone had reduced GHG emissions by 18.3% below 1990 levels, compared to an average reduction of 2.3% in EU-15 (Pew Center on Global Climate Change 2005, p.5)

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## Appendix I

### Ontario Tax for Fuel Conservation (TFFC)

**Table I:** Ontario Tax for Fuel Conservation – TFFC (source: Conservation Council of Ontario 2008)

<b>Highway Fuel Use Ratings (L/100 Km)</b>	<b>Tax on New Passenger Vehicles (\$)</b>	<b>Tax on New Sport Utility Vehicles (\$)</b>
Under 6.0	0	0
6.0 to 7.9	75	0
8.0 to 8.9	75	75
9.0 to 9.4	250	200
9.5 to 12.0	1,200	400
12.1 to 15.0	2,400	800
15.1 to 18.0	4,400	1,600
over 18.0	7,000	3,200

**Note:** Specific information regarding vehicle makes, model years, etc. can be found at the Ministry of Revenue [online]: <http://www.rev.gov.on.ca/english/guides/tffc/index.html>

## Appendix II

### U.S Corporate Average Fuel Efficiency (CAFE) Standards

**Table:** CAFE Fuel Economy Standards in mpg (source: DieselNet 2008<sup>12</sup>)

Year	Cars	Light Trucks		
		Combined	2WD	4WD
1978	18.0			
1979	19.0		17.2	15.8
1980	20.0		16.0	14.0
1981	22.0		16.7	15.0
1982	24.0	17.5	18.0	16.0
1983	26.0	19.0	19.5	17.5
1984	27.0	20.0	20.3	18.5
1985	27.5	19.5	19.7	18.9
1986	26.0	20.0	20.5	19.5
1987	26.0	20.5	21.0	19.5
1989	26.5	20.5	21.5	19.0
1990	27.5	20.0	20.5	19.0
1991	27.5	20.2	20.7	19.1
1992	27.5	20.2		
1993	27.5	20.4		
1994	27.5	20.5		
1995	27.5	20.6		
1996	27.5	20.7		
2005	27.5	21.0		
2006	27.5	21.6		
2007	27.5	22.2		
2008	27.5	22.5		
2009	27.5	23.1		
2010	27.5	23.5		

<sup>12</sup> <http://www.dieselnet.com/standards/us/fe.php>

### Appendix III Data Sources and Assumptions for Different Global Standards

(Source: An and Sauer 2004, p.27)

Region	2002 fleet fuel economy averages for new vehicles		Future fleet average fuel economy average for new vehicles	
	mpg	Data source	mpg & year	Data sources and assumptions
United States	24.1	U.S. EPA laboratory value for 2002, CAFE combined cycle (55/45)	24.3 by 2005 24.6 by 2006 24.9 by 2007	<ul style="list-style-type: none"> <li>Based on enacted standards</li> <li>Vehicle fleet remains 50% cars and 50% light trucks</li> </ul>
California	25.4	Calculation based on data provided by CARB: <ul style="list-style-type: none"> <li>2009 CO<sub>2</sub> emissions will be 1% less than in 2002</li> <li>2009 value is 307 g/mi</li> </ul>	25.0 by 2009 25.9 by 2010 28.4 by 2011 31.8 by 2012 32.6 by 2013 33.2 by 2014 34.4 by 2015 35.6 by 2016	<ul style="list-style-type: none"> <li>Based on approved standards under legislative review for each year</li> <li>Assumes vehicle fleet remains 53% PC/LDT1 (percentage reported by CARB)</li> </ul>
Canada	25.6	2002 combined fleet average from Transport Canada	32.0 by 2010 (proposed)	<ul style="list-style-type: none"> <li>Based on statements by government as part of plan to meet Kyoto commitment</li> <li>2002 baseline year for the 25% increase proposed for 2010 is assumed (however the official baseline has not yet been proposed).</li> </ul>
European Union	37.2	2002 value reported in progress report on the voluntary agreement with industry	44.2 by 2008 51.5 by 2012 (proposed)	<ul style="list-style-type: none"> <li>Based on targets specified in agreement between industry and the European Union</li> <li>Converted to gasoline equivalent mpg (does not account for diesel)</li> </ul>
Japan	46.3	2002 average fleet fuel economy value reported by JAMA	48.0 by 2010	<ul style="list-style-type: none"> <li>Standards state a 23% improvement in fuel consumption from 1995 baseline year</li> <li>1995 average fuel consumption of 14.3 L/km</li> <li>Fleet composition remains constant</li> </ul>
Australia	29.1	Industry agreement states an 18% improvement to 6.8 L/100-km by 2010	34.4 by 2010	<ul style="list-style-type: none"> <li>2010 car average value stated in voluntary agreement with industry</li> </ul>
China	29.3	2002 baseline data based on assessment from China Automotive Technology and Research Center (CATARC)	34.4 by 2005	Future values based on WRI dataset <ul style="list-style-type: none"> <li>Used fuel economy values and vehicle weights from similar vehicles sold in other market to estimate the effect of new regulations on the Chinese fleet</li> <li>Future fleet weight distribution assumed to remain constant</li> <li>Used standards for automatic vehicles</li> </ul>