

# SCRAP TIRE MANAGEMENT IN ONTARIO

by

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# Abstract

## SCRAP TIRE MANAGEMENT IN ONTARIO

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This project paper addresses the major problem of scrap tire management in Ontario. It examines the environmental and health impacts associated with current disposal practices. To address the absence of a management program and lack of regulation for tire disposal in Ontario, tire management programs implemented in other provinces in Canada are evaluated and compared with Ontario, in order to explore the causes of its failure to develop and implement a comprehensive scrap tire management program. The divergence from Ontario on adopting a similar kind of tire management program is because of its strong market driven tire industry and government's reluctance to implement another tax. This paper encourages a tire management system for Ontario as well, which is very similar to those already implemented in other provinces throughout Canada.

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## 1.0 Introduction

The management of scrap tires is a significant problem in the province of Ontario. In Canada, around 30 million tires (37.1 million Passenger Tire Equivalents PTE's) are discarded each year and Ontario alone contributes 10-12 million tires (12.2 million PTE's) (Gillespie, 2008a), which is about one third of the scrap tires generated annually in Canada (Table 1). It is predicted that the number of scrap tires in Ontario will grow to 15 million annually by 2014 (Leslie, 2009). Ontario's large share is due in part to the fact that almost one-third of regional shipments of medium and passenger truck tires are received by Ontario (Figures 1, 2 & 3) (Rubber Association of Canada, 2005). This indicates the dominance of Ontario with respect to the automobile industry and the large number of tire fleets registered in the province (The Rubber Association of Canada, 2005, pg 13). Tire fleets are national brands such as Bridgestone, Dunlop and Firestone, the associate brands (all other brand names owned by the manufacturers) such as Kelly, Dayton, etc and the private brands (brand names not owned by a tire manufacturer) such as Sears, Canadian Tire, Walmart, etc (Rubber Association of Canada, 2005).

Table 1: Scrap tire generation in Canada (1 PTE = 20 lbs) (Rubber Association of Canada, 2005)

<b>Scrap Tires Generated From Highway Tires (in millions of PTE)</b>	
<b>Province</b>	<b>PTE</b>
British Columbia	3.9
Alberta	5.4
Saskatchewan	1.3
Manitoba	1.1
Ontario	12.2
Quebec	10.6
New Brunswick	1.0
Nova Scotia	1.1
Prince Edward Island	0.1
Newfoundland and Labrador	0.4
<b>Canada</b>	<b>37.1</b>

Despite this huge contribution, Ontario is the only province in Canada without a scrap tire management program. The conditions and factors that led to the implementation of a tire management program in British Columbia in 1991 are examined followed by an analysis of similar programs in the provinces of Alberta in 1992 and Quebec in 1993. The most recent province to introduce a tire management program is Newfoundland in 2002.

This paper explains that the absence of a tire management program in Ontario is due to two main reasons. First, it is due to the lack of support from the tire industry and government. Second, the provincial government has been reluctant to introduce a tax on tire disposal because of the unsuccessful experiences previous governments had with a tire tax and public opposition to an additional tax.

The issue of used tire management is interesting in the context of comparative public policy. Ontario and British Columbia originally adopted similar approaches to tire management but later Ontario diverged by cancelling the tire tax. However, in contrast, other provinces continued to implement similar programs for the management of scrap tires within their jurisdictions. So, this is a case of one jurisdiction (Ontario) originally leading and then withdrawing from a policy initiative while other jurisdictions continued to adopt similar approaches. Thus, the scope of policy convergence, or the number of jurisdictions adopting the same tire management policy in Canada increased, while Ontario diverged. Ontario did not adopt a similar policy. This case study helps in understanding the conditions under which a jurisdiction may diverge from a dominant policy path.



Figure 1: Regional tire shipments in Canada for passenger tires (Rubber Association of Canada, 2005)

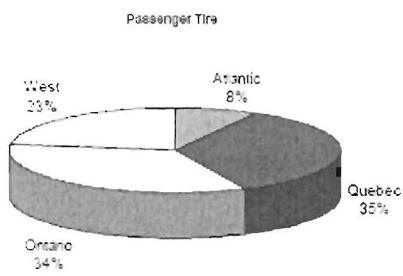


Figure 2: Regional tire shipments in Canada for medium truck tires (Rubber Association of Canada, 2005)

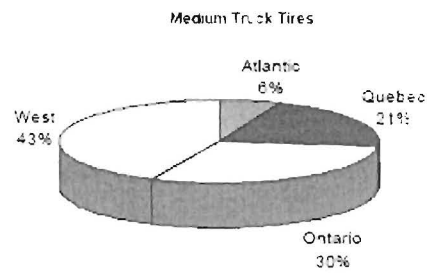
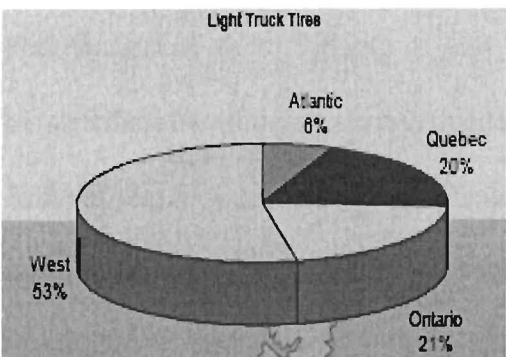


Figure 3: Regional tire shipments in Canada for light truck tires (Rubber Association of Canada, 2005)



To examine this issue, the paper first defines some key concepts and terms used throughout the paper. The paper then reviews the environmental and health impacts of scrap tires. A general discussion of the approach to tire management programs implemented in the US is presented followed by more detailed information on the provinces of British Columbia, Alberta and Quebec. Then, it examines the conditions in which Ontario took its first initiative to manage scrap tires and then cancelled it. The factors that led to the adoption of similar tire management policies in other provinces and territories in Canada are examined. Ontario is compared in general with all other provinces and in more detail with Quebec.

Quebec is chosen because it is the second largest producer of scrap tires in Canada with an annual generation of 10.6 millions of PTE which is comparable to 12.2 millions of PTE in Ontario and also because both of these provinces have huge amount of stockpiles of used tires (Rubber Association of Canada, 2005). Quebec is selected also because of its importance in dealing with the high volume of tires produced not only within its own jurisdiction but also imported from the province of Ontario (Gillespie, 2008a). A large number of tires from Ontario are sent to Quebec to be burned in their cement and pulp and paper industries. Hence, Quebec receives multidirectional flow of scrap tires. Both Ontario and Quebec also experienced huge tire fires in 1990. In the end, this paper evaluates the likeliness of a tire management policy being implemented in Ontario given that a new policy is now under consideration.

## 2.0 Concepts in Comparative Public Policy

To better understand the implementation of and similarities between tire management programs in Canada, the concept of policy convergence is useful. Policy convergence is defined as an increase in the similarity of policies between jurisdictions over time (Heichel et al. 2005) and as suggested by Holzinger and Knill (2005), there are three ways to conceptualize and analyze policy convergence: scope of convergence, degree of convergence and direction of convergence. *Scope of convergence* is defined as the number of jurisdictions with similar policies: The greater the number of jurisdictions with a similar policy, the higher the scope of convergence. The *degree of convergence* is the extent of similarity of policy between jurisdictions. The more similar the policy is across jurisdictions, the higher the degree of convergence. The third dimension for analyzing policy convergence is the *direction of convergence*. The direction of convergence focuses on the strictness of a policy in a jurisdiction. If the policy has an upward direction of convergence then the standards of that policy are becoming stricter. Kikewise, less strict regulations mean the policy has a downward direction of convergence (Holzinger and Knill, 2005).

Holzinger and Knill also suggest that governments may adopt similar policies due to direct and indirect pressure (imposition); they may be legally bound to adopt similar policy as a member of an international institution (international harmonization); or regulatory competitive pressures may require governments to mutually adjust their policies to avoid any regulatory burden. Convergence may also be due to transnational communication and lesson drawing, particularly when they are facing similar problems (Holzinger and Knill, 2005). Independent problem-solving is another causal mechanism

suggested by these authors. There are times when governments may adopt similar policies without any communication due to the fact that they share similar functional, technocratic or technological structures and/or parallel domestic pressures. In the case of tire management, many provincial governments adopted similar policies in response to solving a similar kind of problem, therefore illustrating both independent problem solving and lesson drawing.

In addition to the concept of policy convergence, this paper focuses a great deal on provincial tire management programs. Despite the regular reference to government programs in studies of government policy, explanations for what a program is are rare. For example, a classic Canadian text on Canadian public administration (Kernaghan and Siegel, 1999) provides no definition of a program. Despite this, in this paper and generally, a *program* can be understood as a series of projects, services, incentives, mechanisms or opportunities designed to meet a specific public purpose.

Other key terms used in this paper are legislation, regulation and policy. *Legislation*, or a 'law', is a bill that has been approved by a legislative assembly (legislature, parliament), consisting of elected officials. A bill introduced into a legislative assembly in Canada only becomes a law after it has received majority support in the assembly and after receiving royal assent (see McMenemy 2006, pg 193-196). Laws also often contain provisions that permit a Cabinet to make *regulations* or a list of powers to make regulations (see Estrin and Swaigen 1999, 11). Regulations, also have the force of law, but are more specific, legal mechanisms that usually function to operationalize legislation. Thus, regulations are the detailed rules – “the flesh to the skeletal statutes” (Ibid.). To illustrate, Estrin and Swaigen use the example of the

Ontario's *Endangered Species Act*, 1990. The Act made it an offence to kill any animal, bird, fish or plant of a species that the regulations designate as endangered. However, it took two years to designate any species as endangered (Ibid.).

Regulatory measures are also the primary mechanism used by governments to implement public policy objectives (Benidickson 2002, 105). One of the most common definitions of *policy* is very broad: 'whatever governments choose to do or not to do' (Brooks and Miljan 2003, 4). More specifically, a policy is generally understood to be a government's conscious choice or deliberate action to address a social or public need or issue (Ibid.). Governments and bureaucracies also have a set of internal policies, which guide how government agencies are to interpret, administer and enforce laws, and how agencies will exercise discretion (Estrin and Swaigen 1999, 12). While government policy is often publicly stated, policies are not required to receive consent from elected officials.

This paper primarily discusses provincial tire management programs. However, because many of the programs discussed are the result of or work in conjunction with provincial policy, legislation and regulation, these terms are important to note.

### **3.0 Environmental, health and economic concerns associated with scrap tires**

Scrap tires pose a significant disposal problem because they are made to be highly durable and long lasting making their disposal difficult. In Ontario, unlike other provinces in Canada, most of the scrap tires are stockpiled, sent to a landfill, burned as a fuel, or illegally dumped (MOE, 2008). These practices are a threat to both public health and the environment. Reductions in the numbers of tires discarded each year could be

achieved by increasing the recovery (reuse and recycling) of scrap tires or by decreasing the number of tires produced. The life of tires has already increased in the past years and to further extend tire life would require higher pressure, thicker treads and less flexible material (Jang et al., 1998). This would result in higher costs, more fuel consumption and rougher rides (Jang et al., 1998).

The primary advantage of disposing tires at a landfill is that it avoids the cost of processing. Also, no GHG emissions are associated with the whole tires at a landfill as tires decompose very slowly but the environmental hazards from these tires is of great concern (Pehlken and Essadiqi, 2005). Whole tires do not compact and when they are disposed of at a common landfill they reduce the capacity of the landfill, filling up the landfill faster and generating need for more landfills (Barlaz, 1993). The tires may also float to the surface of the landfill cracking and damaging the compacted clay liner or the cover. Surface water could enter the landfill through this broken cover and form harmful leachate (Ceçich et al., 1995). Large numbers of tires lying at a landfill also pose a fire hazard (Pehlken and Essadiqi, 2005).

Used tires can produce high energy and are commonly used as Tire Derived Fuel (TDF) in cement and pulp and paper industries. Coal can generate between 26,000 to 31,000 kJ/kg of energy when burned, while whole tires and fuel derived from tires can yield from 30,000 to 35,000 kJ/kg of energy (Barlaz, 1993). The two major environmental concerns with paper and pulp and cement industries are their air emissions and ash disposal (Barlaz et al., 1993). The comparison of coal and TDF shows that when tires were replaced for coal, it resulted in reduced NO<sub>x</sub> and SO<sub>x</sub> emissions; however, it increased chlorine emissions (OMOE, 1991). Also, the emission of particulate matter

with TDF is likely to have high zinc content because it is added in the tire manufacturing process. However, the emissions data are highly dependent on the type of emission control equipment in use, the portion of TDF used as an energy input for the boiler as well as the operating conditions (Barlaz et al., 1993). Thus, substituting TDF for coal in the boilers in pulp and paper and cement industries would result in increasing some pollutants and decreasing others. The actual values will vary depending on the type of air pollution control equipment in place and the fraction of TDF burned. Another potential concern with using TDF is metal in the tires. These metals get incorporated into the cement followed by their release from cement into the environment (Barlaz et al., 1993).

Stockpiles of discarded tires present health concerns as well. In the case of a tire fire, air pollutants, a wide range of pyrolytic hydrocarbons, metals and ash residues in the form of thick black smoke released into the environment pose a serious health hazard not only for the people living near the tire deposit. The transport of these toxic air pollutants may require evacuation of a huge area (Blumenthal et al., n.d). Organic pollutants from incomplete combustion are found to be carcinogenic to humans and rodents and mutagenic in bacteria and mammalian cells (Pehlken and Essadiqi, 2005). Another health concern with regard to stockpiles of scrap tires is their high impermeability. They can hold water for long periods of time creating ideal breeding grounds for mosquitoes and their larva developments (Engstrom and Lamb, 1994). Besides, the major nuisance of mosquito bites, mosquitoes can also spread several diseases such as West Nile virus, dengue fever, and yellow fever. A study done in Ohio showed that most of the children suffering from mosquito-vectored disease were living within 100 yards of a tire deposit

(Liu et al., 1998). Mosquito-transmitted viral diseases can also cause brain inflammation/encephalitis (NCID, 2007).

Tire dumps are also serious fire hazards. Because of their high void space (almost 75%), they can lock in sufficient amounts of oxygen to start a fire and thus contaminate air with huge amount of air pollutants released with it (Khan et al., 2005). This includes carbon monoxide (CO), sulfur oxides (SO<sub>x</sub>), nitrogen oxides (NO<sub>x</sub>), and volatile organic compounds (VOCs). They also include other hazardous air pollutants, such as polynuclear aromatic hydrocarbons (PAHs), dioxins, furans, hydrogen chloride, benzene, polychlorinated biphenyls (PCBs), and metals, such as arsenic, cadmium, nickel, zinc, mercury, chromium and vanadium (Lemieux and Ryan, 1993). It is extremely difficult to extinguish a tire fire once started (Khan et al., 2005). According to the United States Environmental Protection Agency USEPA, a single melted tire can produce up to two gallons (7.60 liters) of contaminated oil and using water on the tire fire increases the production of pyrolytic oil, creating a means of transporting oil off site, thus contaminating the soil and ground-water (Cecich et-al., 1995) with benzene, toluenes, xylenes, zinc oxide, phenols and ammonia, as well as trace amounts of polychlorinated dioxins and furans (Legzdins, 1990). The litres of water used on the tire fires may also wash the oil into nearby aquifers.

There is a huge financial cost associated with not managing scrap tires in an environmentally responsible way. The most important cost is the governmental liability for the restoration of contaminated sites. Governments have to spend millions of tax dollars dealing with the consequences and cleaning up the mess afterwards. Air pollutants released into the environment may last there for several years. As seen in the case of tire



fires in Ontario and Quebec, the governments had to spend \$10 and \$12 million dollars respectively for the decontamination of the sites and the surrounding area (MOE, 2008).

Despite these arguments in favour of tire recycling, due to heavy metals and other chemicals such as carbon black, zinc oxide and sulfur in tires, tire recycling also has some associated environmental costs. Any manufacturing process releases some pollutants (such as emissions) to the environment, consumes energy and produces waste. This would certainly be true for tire recycling and reuse programs. But if compared with the negative impacts of stockpiles of tires noted above, recycling tires seems to produce fewer direct environmental and health problems.

For example, a major use of scrap tires is in the production of crumb rubber, which is used in surfacing applications such as playground surfaces. Public concerns with regards to its applications include environmental toxicity of leaching and possible release of carcinogens (Pehlken and Essadiqi, 2005). If the metal ions (part of tire composition) are released into the environment they are relatively mobile and can contaminate soil, ground and surface water. However, in most cases the concentration is very minute and the impact is relatively low (Pehlken and Essadiqi, 2005). Scrap tires used in other civil engineering applications may cause exposure of volatile constituents through skin contact or inhalation. However, a report concluded that “there was little potential for an exposure sufficient to cause adverse health effects in children” (Pehlken and Essadiqi, 2005).

On balance, the concerns that arise from a business-as-usual approach to scrap tire disposal seem to be outweighed by the benefits of tire recycling and reuse. Despite this, the government of Ontario has failed to implement a comprehensive tire management program. In the next two sections, approaches to tire management in the US and three

Canadian provinces (British Columbia, Alberta and Quebec) are reviewed before examining Ontario.

#### **4.0 Scrap Tire Management in the US**

Developing and implementing a tire management program is a complicated process because it requires management between various stakeholders such as retailers, manufacturers, and government agencies. In the US, in 2003, 290 million scrap tires were generated. This is in addition to 275 million scrap tires in stockpiles. The major part of all scrap tires (almost 91% ) stockpiled in the US are concentrated in the states of Alabama, Colorado, Connecticut, Michigan, New Jersey, New York, Ohio, Pennsylvania, Texas, Massachusetts and Washington (Rubbers Manufacturers Association, 2004). This has led to a rapid evolution in tire recycling within the US.

Until 1990, only 17% of tires were recycled. In 2008, 233 million tires were reused and recycled, which is almost 80.4% of total number of scrap tires generated annually (US EPA, 2008). About 16.5 million scrap tires are retreaded and 27 million scrap tires (9.3%) are disposed of in landfills (Rubber Manufacturers Association, 2004). Many retreaded tires are exported to other countries to be reused. According to an estimate done by Mexico's National Association of Tire Distributors, almost 20% of tires sold in Mexico are imported as used tires from the US (US EPA, 2008).

In 1984, Minnesota was the first state to implement a tire management program followed by Oregon, Wisconsin, Florida, and Washington by 1989 (US EPA, 2008). In the US, thirty-eight percent of states have banned whole tires from landfills; thirty-five states allow shredded tires to be placed in landfills; eleven states ban all tires from

landfills; seventeen states allow processed tires to be placed into monofills and eight states have no restrictions on placing scrap tires in landfills (Rubber Manufacturers Association, 2005). Many states have cleaned up their large numbers of tire stockpiles. Minnesota, Wisconsin, and Maryland are the three states which report having cleaned up all scrap tire stockpiles. By 2008, forty-eight states had enacted laws to manage scrap tires. Alaska and Delaware are the only two states without any scrap tire laws or regulations (US EPA, 2008).

To help local governments reduce the economic burdens and environmental risks associated with scrap tire piles, the US EPA, with support from members of the national Resource Conservation Challenge Scrap Tire Workgroup, have developed the Scrap Tire Cleanup Guidebook (US EPA, 2008). The guidebook reflects the experience of several professionals in one resource designed to help state and local officials to successfully clean up scrap tire piles in their jurisdictions. The guidebook provide help in starting a cleanup program, working with contractors, and implementing prevention programs that will help to reduce illegal dumping of scrap tires (US EPA, 2008). As in Canada, many states in US also collect fees to fund their scrap tire management programs or for stockpile cleanup. Tire fees are typically assessed on the sale of new tires or on vehicle registrations. Fees generally range from \$0.50 to \$2 per passenger car tire, and truck tire fees range from \$3 to \$5 (US EPA, 2008).

## **5.0 Tire Management Programs in Canada**

Tire management programs in Canada started because provinces faced a similar problem of managing their scrap tires in an environmentally sound manner.

In general, under these programs, consumers are charged a tire tax (levy) each time they buy a new tire which is collected by the retailers. Retailers then submit these funds to a tire management board, which is responsible for running the tire management program in the province and is answerable to the provincial government. As used tires are categorized as municipal waste, their disposal falls under provincial and municipal jurisdiction. Hence, provincial governments are responsible for the compliance and enforcement of the tire management program.

These programs address a diverse range of tire recycling organizations from low technology small plants to companies with international patents that promote their products around the world (Murray, 1996). Some recycling firms produce rubber boomsticks for-use as bumpers between a tug boat and a log boom; other high-technology tire-recycling companies have developed processes to recover 98% of the useable rubber from the steel in tires for the conversion of steel-belted tires to rubber crumb (Murray, 1996).

The first tire recycling program in Canada was started in 1991 in British Columbia. This section examines how the program operates in British Columbia followed by an overview of the tire program in Alberta which was the second province in Canada to implement a tire recycling program. Quebec is the last province to be considered before Ontario. While each of these provinces claim that their tire management programs are cost neutral, there is not enough data to verify these claims. There is an absence of

detailed data and information on program costs and revenues are drawn from provincial reports.

### ***5.1 British Columbia***

In 1990, a predisposal fee of \$3 was introduced for each new tire sold in British Columbia having a retail value of more than \$30. This fee supports the Sustainable Environment Fund to be used for paying for the collection and processing of tires province-wide (Environment Canada, n.d). In 1991, the British Columbia (BC) Ministry of Environment started a tire recycling program called the FIRST program (Financial Incentives for Recycling Scrap Tires Program) to recycle scrap tires. The program was intended to change scrap tires from being an environmental burden to being a commodity.

In British Columbia, 3.2 million tires are sold each year while 2.5-3 million scrap tires are generated each year (BC MOE, 2008). With a levy of \$3 for each new tire collected by the retailers (2,000 retailers), approximately \$10 million of revenue is generated annually by the program which is passed on to the provincial government (BC MOE, 2008). With the revenue generated, the program pays a transportation credit to transporters for collecting the scrap tires from their generators and moving them to the closest eligible processors. Transporters are paid by distance travelled and weight carried from the generating site to an eligible processing site, independent of the type of end use. All processors with an eligible end use under the program are entitled to transportation assistance (BC MOE, 2008).

The processors registered under the FIRST program are also eligible for end use credit. There are four major processors in the program which process almost 3.4 million passenger tire equivalents. Before the implementation of the program, only 15% of the 2.5-3 million scrap tires were recycled, usually by retreading (Environment Canada, n.d). Now, after the implementation of the program the province produces crumb rubber to be used in rubberized asphalt, cow mattresses, running tracks, playing fields, blasting mats and many other products. Scrap tires are also used to produce tire-derived fuel (TDF) (Environment Canada, n.d). The program pays incentives to the eligible processors on providing proof of the sale of the recycled tire product at a per tonne rate that is based on the type of end use of the material. For example, different rates are paid for crumb rubber, shredded rubber, cut tires, whole tires, and tire derived fuel (a higher rate is paid for more processing, such as rubber crumb, than all other end use products with less processing).

The program does not allow burning of scrap tires at a landfill nor the stockpiling of tires. It pays incentives, where eligible, for cleaning up the stockpiles (BC MOE, 2008). The provincial government is responsible for the complete compliance and enforcement of the program (BC MOE, 2008). The Ministry of Environment monitors and examines the processors receiving financial assistance by the program and it may ask its participants to submit audit reports and they themselves are responsible for paying for these audits (BC MOE, 2008).

The annual recovery rate is calculated to be approximately 100% for all tire sizes collected (Environment Canada, 2007a). Around 300,000 PTEs (passenger tire equivalents) are received by the program every month. As of 2004, approximately 38

million PTEs, standardized to a weight of 8.2 kilograms, have been diverted from landfills and other forms of disposal, at a total program cost of \$65 million leading to a unit cost of \$1.71 for the program (\$65 million/ 38 million tires: total program cost / total number of tires diverted) (Environment Canada, 2007b). The implementation of the program also created 200 employment opportunities for the province (BC MOE, 2008). These improvements by the program show its success and progress given that it was the first province to start a tire management program. The program in British Columbia showed other jurisdictions that economic and environmental benefits could be achieved through a comprehensive system built on incentives. However, more detailed information about the cost of administering the program could not be retrieved to make a clear and categorical statement that the program was not costing the province. A similar kind of program was implemented in the province of Alberta in 1992.

## ***5.2 Alberta***

A tire recycling management program in Alberta started in 1992. The program has a multi-sector board of directors consisting of twelve members. Initially, the program was monitored by the Tire Recycling Management Association (TRMA). In 2004, the government of Alberta implemented the Designated Material Recycling and Management Regulation (Alta. Reg. 93/2004) under the Alberta Environmental Protection and Enhancement Act. Since then, the Tire Recycling Management Association became the Alberta Recycling Management Authority (ARMA). The regulation authorizes ARMA to make bylaws for the program and these bylaws provide the decision making framework of ARMA such as committees and financial obligations (ARMA, n.d).

Under the program retailers provide their collected scrap tires to the processors and the program provides financial incentives for the first step of processing, which is shredding. This incentive provides for both the collection of whole tire as well as shredding (\$175 per tonne of shredded material produced) (Environment Canada, 2007d).

There are eleven processors (3 shredders, 3 crumbers, and 5 manufacturers) in the province, which process approximately 3 million PTEs each year (Environment Canada, n.d). The recycled rubber is then used as a shred for civil engineering projects such as road asphalt and industrial flooring, loose crumb for playground surfaces, poured-in-place materials, molded products, coatings and sealants. The program pays incentives according to the extent of processing done (more for shredders than crumbers). There is a pre-calculated amount of credit that is paid to a processor on providing the proof-of-sale of new recycled products (Environment Canada, 2007d). Manufacturers are also paid \$100 per tonne of the tire recycled product that is sold (Environment Canada, n.d).

The ARMA manages the program for the government. It has to report to the Minister of Environment for its accomplishments and targets through its three-year business plan, annual budget, annual report and Memorandum of Understanding with the Minister (Environment Canada, n.d). There are around 1800 retailers registered under the program. They are responsible for collecting a \$4 levy for each tire and they all report to ARMA on the amount of tires sold in the province (ARMA, n.d).

The program has showed continued progress. Albertans produce 4-4.5 million scrap tires annually (ARMA, n.d). According to annual reports by ARMA, 2.83 million tires were recovered in 2000-2001 and it increased to 4.16 million tires by 2004-2005 (Environment Canada, n.d).



The Tire Recycling Management Association initially operated the program until in 2004, when the Government of Alberta put into effect the Designated Material Recycling and Management Regulation (Alta. Reg. 93/2004) under which the Tire Recycling Management Association became the ARMA, with the responsibility to act as a tire board for the tire recycling program in the province (ARMA, n.d).

The program produces \$11.75 million of yearly income and the annual expense for the program is estimated to be \$10.4 million according to ARMA (Environment Canada, n.d). Ninety percent of the revenue generated from the program is used for incentives and five percent is spent on administration and grants (Environment Canada, n.d). The tire recycling program in Alberta is a second case to demonstrate that economic benefits can result at the same time as disposal benefits. Managing these tires in a responsible manner reduces governmental liability to deal with the hazards and consequences of scrap tires pile up and provide with immeasurable environmental benefits. However, there are no statistics available to suggest that the program is self-sufficient. If a waste management issue is ignored and left unaddressed by a jurisdiction, it not only has to face the economic loss and environmental consequences but also the continuous input from the incoming stream of waste. This in combination with the already accumulated waste makes the problem even worse and difficult to handle. As an example, Quebec faced a similar kind of situation before it started a tire management program.

### *5.3 Quebec*

In 1990, Quebec had a huge tire fire in Saint-Amable in which 3.5 million tires burned for more than sixty days. The government of Quebec had to spend \$12 million for the decontamination and the restoration of the site and the surrounding area (Recyc-Québec, n.d). The same year the Quebec government decided to invest \$2.2 million to make tire storage safe through fencing and isolation operations. The scrap tire recycling program in Quebec started in 1993 and was initially funded by Recyc-Québec which was formed in 1990 to promote reduction, reuse, recovery and recycling of waste material with a view to conserve resources. In 1999, a tire levy was implemented under which the consumers had to pay a tire levy of \$3 per tire collected by retailers. The funds collected were solely to be used for tire recycling and management purposes by the program (Recyc-Québec, 2008). It is important to note here that over \$150 million collected from tire tax in Ontario between the period of 1989-1993 went to general revenues and very nominal amount was spent on recycling (as explained below) (Gillespie, 2008 c).

In 2000, “The Regulation Amending the Regulation Respecting Used Tire Storage” and the “Regulation Respecting Solid Waste” came into effect in Quebec. Under these regulations, all the tire storage sites were to be cleaned and closed by the end of year 2008. With the implementation of the regulation in 2001, it became illegal to store, bury or burn scrap tires and compelled that scrap tires must be made accessible to recycling and reclamation companies for their proper treatment (Recyc-Québec, 2008). There are remolding, recycling and reclamation facilities that produce remolded tires, tires for wheeled carts, mud flaps, blasting mats, anti-skid and anti-wear mats, carpet underlay, acoustic underlay, sports surfaces, floor coverings, soundproofing panels, speed

bumps, adjustment risers, doorstops, asphalt, planters and even crafts. Most of these recycled products are exported but the processors are not required to do so. They receive incentives from the program on providing proof of sale of these products (Recyc-Québec, 2008).

Recyc-Québec manages the program and is held responsible by the government (the Quebec Minister of Sustainable Development, Environment and Wildlife). The levy per new tire is collected by the retailers then passed onto Recyc-Québec. With the involvement of 15 recycling companies the program has created 100 jobs in the collection and 500 jobs in the processing and recycling sectors (Environment Canada, 2007c). According to Recyc-Québec the annual revenue generated from the levy in year 2004-2005 was \$22.4 million, all of which was directed towards the program: 42.5 percent towards transportation, about 30 percent towards processing, 1.7 percent towards research and 25.8 percent towards cleaning-up the stockpiles (Recyc-Québec, n.d). As these stockpiles are cleaned each year, their numbers are reduced and hence, the net unit cost vary from year to year. The target (85 percent) set in the 2001-2008 policy for cleaning the stockpiles through reuse and recycling initiatives has been achieved since the year 2001-2002 (Environment Canada, n.d). Thus, Quebec shows that recycling scrap tires can produce both economic and environmental benefits. This is particularly important for Quebec as it is the second largest producer of scrap tires in Canada.

## **6.0 Ontario: Explaining Action**

The problem of used tires is significant in Ontario not only because of the high number of used tires generated, while another contributing factor is the existence of high volume of stockpiles across the province. It is an economic loss for the government to deal with the consequences of used tires given its significant impact on public health and the environment. It is also a loss of opportunity for creating jobs in the collection, recycling and processing sectors.

Ontario was the first province in Canada to propose a scrap tire management program. It has been twenty years since the first initiative was taken by Ontario, but, until today it remains without a comprehensive tire management program. In order to explain this uniqueness, and to investigate the causes and circumstances that led to its current status, this section examines the current setup of tire industry in Ontario and the initial actions taken by the government to explicate the reasons for the absence of a comprehensive program.

### ***6.1 Ontario's current tire collection system***

Unlike other provinces, Ontario's tire industry is motivated to dispose tires in the least expensive manner which leads to a compromise on quality disposal management. Ontario has the largest number of tire fleets registered in the province (Rubber Association of Canada, 2005). It also receives the largest shipment of medium and passenger tires in Canada indicating its strong economic character with respect to automobile industry (Figure 1, 2 & 3) (Rubber Association of Canada, 2005).

It is important to distinguish between a tire collection system and a comprehensive tire management program. Ontario does have a tire collection system. There are approximately 10,000 to 12,000 tire retail points and under its current system, a fee is charged at each stage of processing. Retailers collect old tires as a service to their customers who purchase new tires from them and non-customers may also drop off their used tires (OTS, 2009). Tire dealers and retailers charge disposal fees (either separately or in the sale price of a new tire) according to their own business needs, and the fee varies across the province (OTS, n.d). The retailers then pay the haulers to collect these used tires from them (OTS, 2009).

Haulers generally drop off their collected tires at the dumping site and pay a tipping fee. In Ontario, any site storing more than 5,000 tires is required to have a Certificate of Approval issued from the Ministry of Environment. These private tire sites may be operated illegally, i.e. without a valid Certificate of Approval or legally by storing less than 5,000 tires or with more than 5,000 tires under a Certificate of Approval. In the current collection system in Ontario, collectors are contracted for the removal of accumulated used tires with tire haulers serving their area. Haulers now charge the collector a fee to remove the tires. The collectors then recover this cost by charging customers and non-customers for accepting used tires from them (OTS, 2009). Hence, even though a fee is charged at each stage of the collection system, most of these tires are disposed off in an environmentally unfriendly manner. Ontario's current tire industry has opposed a tire management program because they have argued that Ontario already has an efficient tire collection system in which tires are collected from the retailers and passed onto the processors. But the current system fails to encourage processors to

recycle tires (no incentives) and hence they are usually disposed off in a least expensive and environmentally unfriendly manner.

## ***6.2 Government's Reluctance: Scrap Tire Management in Ontario 1989-2004***

In 1989, David Peterson's Liberals introduced a levy of \$5 per tire in the province. At the time, it was thought that the funds generated from the tire tax were going to be used towards a tire management program. Instead, the money went to the General Revenue Stream. In 1993, Bob Rae's NDP government cancelled this program and over \$150 million in revenue from the tire tax collected during 1989-1993 went to the consolidated revenue fund. Less than one-tenth of that amount was spent on promoting scrap tire recovery and recycling (Gillespie, 2008 b). In June 2002, the Ontario legislature passed the Waste Diversion Act to promote reduction, reuse and recycling of waste. This act established a multi-stakeholder board, Waste Diversion Ontario (WDO) to develop, implement and operate waste diversion programs. A year after, in June 2003, Ontario Regulation 84/03 came into effect and OTS (Ontario Tire Stewardship) was incorporated as a non-profit organization to develop a tire management program for Ontario (Environment Canada, 2007e).

In September 2004, WDO approved the Scrap Tire Diversion Program for Ontario (developed by the OTS) and submitted the proposal to the Minister of Environment for final approval. In the proposed plan, a \$4 fee on passenger vehicle tires and a \$6 fee on truck tires were to be paid by consumers each time a new tire was purchased. While this plan was under review, the Ontario Tire Dealers Association (OTDA) and the Ontario Tire Collectors Association (OTCA) jointly released their own plan: Ontario Tire

Recycling and Economic Development plan (OnTRED) (PPS, 2005). Unlike the plan proposed by OTS, incentives were offered to the consumers on purchasing recycled products and no incentives were offered to the processors. Environmental groups, including the Toronto Environmental Alliance (TEA) and the Canadian Environmental Law Association supported the OnTRED plan (PPS, 2005). Despite the fact that both environmental and industry groups supported the plan, the Ontario Liberal government did not support their plan. At that time, the government already had negative responses from Ontarians to the Ontario health care premium, and was well aware of the bad feeling caused by the tire tax introduced by the Peterson Liberal government in the late 1980s. Thus, the Premier and his finance minister wasted no time in turning down the proposal of a new fee for tires. In 2005, Premier Dalton McGuinty said, "There will be no tire tax. Everybody get that one?" (PPS, 2005). In doing this, McGuinty, killed an opportunity for Ontario to have a tire management program, at a time when every other province had already started a program. The government at the time did not want to be blamed for imposing a new tax when Ontario already had one of the highest provincial tax rates and the government was embarrassed for having a catastrophic tire fire in 1990 when the tire tax was still implemented. The government ignored the issue rather than deal with it.

In 1990, Ontario was not only without a tire management program but it also had weak monitoring of tire disposal and management, further aggravating the problem. According to Ontario's general waste management regulations, any tire site storing more than 5,000 tires is required to have a Certificate of Approval issued by the MOE (EPA, R.S.O. 1990, c. E.19). There were several sites all across Ontario storing large number of scrap tires without any such valid certificate issued by the Ministry (MOE, 2008). The

Melbourne tire site is a privately owned tire site situated in Middlesex County. This site also illegally stored used tires. The estimate for the number of tires stored at this site was done by the Ministry of Environment itself in 2004, and thus this site was known to be the largest illegal stockpile in Ontario having more than 300,000 tires piled up without a valid certificate (MOE, 2008). In 2007, the Middlesex-London Health Unit issued a report showing their concerns that the tire site posed a potential risk of West Nile virus. But, nothing was done about it.

In 2003, after more than a decade of negligence, the Ontario MOE started taking strong action against the illegal stockpile of tires across the province. It ordered the owners of nine used tire sites to remove illegally stored tires as they did not have an applicable Certificate of Approval from the Ministry of Environment.

MOE used its Environmental SWAT Team to carry out strict inspections of used tire sites. As part of this cleanup, the tire sites to be cleaned were Otterwood tire site in Norwich Township, Dom's Auto Wreckers in the Municipality of Clarington; the Erie-Vu Trailer Park in Elgin County; the Havelock tire site in Havelock-Belmont-Methune Township; the Albert Helmer tire site in Norfolk County; the Bill Lane tire site in the Municipality of Southwest Middlesex; the Minden tire site in the Township of Minden Hills; the Teefy tire site in the City of Kawartha Lakes; and Uxbridge Auto Wreckers in the Township of Uxbridge. The Ministry of Environment ordered all of them to remove tires from their sites (MOE, 2003, pg 30). The same year, the owners of Casboro Industries in Brampton were also ordered by the Ministry of the Environment to cleanup illegally stockpiled tires from their site (MOE, 2003, pg 30). In case of non-compliance



the ministry allocated \$1 million to take action against the owners of these sites (MOE, 2003, pg 30).

In March 2008, the Ministry of Environment finally decided to spend \$2 million to clean up the Melbourne tire site. This was the third major clean up carried out by the government of Ontario that year. The other two major sites were at Otterville located in Oxford County in 2004 and at Manitoulin located in First Nations reserve in 2007 (MOE, 2008).

Since then the government has not taken any further measures to address this issue and with no up-to-date inventory, it is presumed that there are still many illegal stockpiles all across the province posing a serious threat to public health and the environment. This is an important example of implementation gap and enforcement deficit by the Government of Ontario on an environmental issue.

## **7.0 Explaining Implementation of Used Tire Programs in Canada**

Fortunately, scrap tires are useful resource that can be recycled and managed properly to produce value-added products, thus been beneficial to both the environment and the economy. This section analyses the conditions under which scrap tire management program was first started in Canada and led to the transfer of a similar program in other provinces and territories in Canada.

### ***7.1 Tire fire at Hagersville***

In January 1987, the owner of the Hagersville tire site was ordered by the MOE to divide these tires into smaller divisions so it would be easier for fire fighters to control the fire in

case it catches fire (CBC, 1990). The owner appealed the decision in the court and lost it and then it was re-appealed and was pending in divisional court at the time of fire. The owner argued that division of tires will not help in controlling the fire.

Subsequently, while the decision was still awaiting in court, on February 12, 1990, a huge pile of scrap tires in Hagersville, Ontario caught fire and burned for three weeks; releasing toxic fumes into the air and over 600,000 litres of oil were released into the surrounding soil (Gillespie, 2008b). At that time, piles of scrap tires were present in almost every province in the country. Almost 14 million tires were burned covering over 20 acres of land at the Hagersville fire (CBC, 1990) and the government of Ontario had to spend \$10 million to fight the fire and clean up the mess (Gillespie, 2008a). In the fire, around 2500 people were affected and the MOE had to setup air monitoring stations at Hagersville and Hamilton area. Crews from 11 different fire fighting departments battled to control the fire (CBC, 1990). This acted as a wake-up call to all provincial governments in Canada, alerting them of the potential of the same disaster in their own backyards. The same year, British Columbia introduced the FIRST program and became the first province in Canada to implement a used tire management program (Environment Canada, 2007a).

This idea of a predisposal fee for tires actually started in Ontario but was modified and applied in the form of a used tire program in British Columbia. It was then adopted by Alberta in 1992, Quebec in 1993, and so on and so forth for all other provinces and territories in Canada. The most recent program was implemented by NFLD (Newfoundland and Labrador) in 2002 as shown in Table 2.

All provinces adopted similar tire recycling programs because they were facing the same problem of managing their scrap tires. The number of scrap tires generated in each province was different and so was the existing status of the stockpile and recycling capacity. The programs implemented by British Columbia and Alberta worked out well, therefore it seemed that all other provinces learned from these early experiences and worked towards adopting similar programs. This helped other provinces to successfully achieve competent results. The Canadian Council of Ministers of the Environment (CCME) also encouraged provincial action.

## **7.2 CCME**

The Canadian Council of Ministers of the Environment (CCME) is a major intergovernmental forum in Canada. Its purpose is to promote the cooperation and harmonization of interprovincial issues such as waste management and air pollution. It proposes nationally-consistent environmental standards to achieve a high level of environmental quality across the country. However, it cannot impose its suggestions on its members since it does not have the authority to implement or enforce legislation. Each jurisdiction has the right to independently decide whether or not to adopt CCME proposals (Environment Canada, 2004). After the Hagersville fire, the issue was taken up by the CCME. It promoted the diversion of waste tires from waste streams and encouraged provincial governments to reuse and recycle tires. They proposed a goal of 50% waste reduction in waste by the year 2000. *tires*, Dec 1990 and *Processing Technologies and Manufactured Product from used tires*, Jan 1991 (Environment Canada, 2004).

Table 2: Scope of Convergence: Tire Management Programs in Canada

PROVINCE	PTE	YEAR	PROGRAM	TIRE BOARD	TIRE TAX	ELIGIBLE TIRES
British Columbia	3.9	1991	Financial Incentives for Recycling Scrap Tire Program	British Columbia Ministry of Environment	\$3	PLT
Alberta	5.4	1992	Tire Recycling Management Program	Alberta Recycling Management Authority (ARMA)	\$4	Licensed Highway Vehicles
Manitoba	1.1	1994	Used Tire Stewardship Program	Manitoba Tire Stewardship Board (MTSB)	\$3	Licensed Highway Vehicles
New Brunswick	1.0	1996	Tire Stewardship Program	New Brunswick Tire Stewardship Board	\$3, \$9	PLT HT
Nova Scotia	1.1	1997	Used Tire Management Program	Resource Recovery Fund Board	\$3, \$9	PLT and HT
Saskatchewan	1.3	1998	Scrap Tire Program	Saskatchewan Scrap Tire Corporation (SSTC)	\$3.50 up to \$35	PLT, MT, HT and ORT
PEI	0.1	1999	Tire Recovery Program	Island Waste Management Corporation	\$4	PLT and MT
Quebec	10.6	1999	Quebec Integrated Used Tire Management Program	Recyc-Québec	\$3	PLT and MT
Yukon	--	2002	Used Tire Management Program	Yukon Provincial Govt (Department of Environment)	\$5	PLT and HT
NFLD	0.4	2002	Tire Recycling Program	Multi-Material Stewardship Board (MMSB)	\$3, \$9	PLT HT
Ontario	12.2	200?	Tire Stewardship Program	Ontario Tire Stewardship (OTS)	--	PLT HT and ORT

PTE: Passenger Tire Equivalents (produced per year)

PLT: Passenger Light Tires

HT: Heavy Tires

ORT: Off- the-Road Tires (heavy mining, agricultural and industrial tires including farming and airplane tires)

MT: Medium Tires

In 1989, the provincial government in British Columbia adopted the proposed goal to divert 50% of its waste from going into landfills. It produces 2.5-3 million scrap tires each year. Prior to the implementation of a tire program, 85% of the scrap tires were sent to a landfill, stockpiled or used for accelerating the burning of land-clearing debris from forest harvesting operations. This was reducing the availability and capacity of landfills in the province. It was also a challenge to the commitment by the BC Solid Waste Management Program for reducing 50% of waste from going into the landfill.

This led local governments and the municipalities to recognize the need for a tire recycling program. In 1990, tire tax was implemented and the revenue generated was used for providing incentives for the collection and processing of tires province-wide (Environment Canada, 2007b). It was transformed into a tire program under the *Waste Management Act* in 1991 which made British Columbia the first province in Canada to implement a used tire management program.

In 1989, the government of Quebec also adopted a similar program on integrated solid waste management in response to Quebecers' growing concerns over the way waste was handled. In 1990, Recyc-Quebec was established and a used tire program was started in 1993 which at that time was funded by Recyc-Québec. Thus, comparing British Columbia to Quebec, both provinces adopted similar policy goals but initially took different approach towards achieving those goals. They chose different policy instruments/ regulatory tools to achieve those goals. In Quebec, the program was initially run by Recyc-Québec with no tire levy implemented. After six years of operation under government funding, in 1999, Quebec also implemented a tire levy to make the program self supported. It is important to remember here that Quebec is the second largest

producer of scrap tires in Canada and in the absence of a tire levy the government had a huge financial burden to bear the complete cost of the program. This could be gauged from the amount of over \$22 million (collected from tire levy) spend towards the program in year 2004-2005 (Environment Canada, 2007b). After the levy was introduced, it resulted in stricter regulations coming into effect in 2000. This seems to be consistent with other research examining the convergence of environmental policy and law. Sometimes when a jurisdiction follows the actions of other jurisdictions (increasing convergence), not only do the number of jurisdictions with similar policy increase (the scope of convergence), but an upward direction of convergence can also occur; that is, the regulation may become stricter in the new jurisdiction (Knill, 2005).

Under Quebec's regulations, "The Regulation Amending the Regulation Respecting Used Tire Storage" and the "Regulation Respecting Solid Waste" all the storage sites were to be cleaned and closed by the end of year 2008 (Recyc-Québec, 2008). It was made illegal to store, bury or burn scrap tires and it also required that scrap tires be made accessible to recycling and reclamation companies for their proper treatment.

In general, the tire programs in all provinces require customers to pay a predisposal fee each time when they buy a new tire. Tire retailers usually collect this fee and in order to operate in the province they must be registered in the tire recycling program. They then submit these funds to oversight board, which is responsible for the collection of all fees, and use of these funds for proper management and disposal of used tires. Incentives are provided for the collection and processing of used tires but the companies are also required to be registered under the program to be eligible for

receiving these incentives. Tire boards also support research and development, promote recycling, educate customers, etc. Provincial governments are responsible for the complete compliance of the program.

## **8.0 Explaining Convergence in Tire Management Programs**

Early leaders in implementing tire management programs did so in isolation of others as part of independent problem solving and later on the provinces adopted similar programs as part of lesson drawing and inter-provincial policy convergence. British Columbia, Alberta and Quebec took different approaches at the beginning of their programs but then converged towards adopting similar programs. At the beginning of these programs there were concerns with the interprovincial flow of these tires. Tire recyclers would prefer provinces offering the most generous recycling subsidy. In response to this concern, in 1994 CCME's analysis showed that the provincial programs were not harmonized but there was no significant evidence that it may be contributing to cross-provincial movement of tires (Environment Canada, 2004). This led to a number of models being proposed by CCME, to be adopted by any province under the process of developing a tire management program or by other provinces to make their program more self-funded by introducing a tire tax (Environment Canada, 2004). Every other province in Canada then followed this model, as part of lesson drawing.

When trying to understand similarities between jurisdictions, the concept of policy convergence is useful. Convergence of a policy between regions on an environmental issue can also be explained on the basis of institutional similarities between them, as suggested by Lenschow et al. (2005). In Canada, provinces that have

comprehensive tire management programs seem to have done so through independent problem solving and lesson drawing. These programs began as independent problem solving because provinces faced a similar problem but initially chose different policy instruments. Then later on, as part of lesson drawing and inter-provincial policy convergence, similarities emerged further increasing the scope and degree of convergence. All provinces have used the same instrument; that is, they all have introduced a levy which is collected by a tire board, and all programs seek the proper collection, transportation and processing of used tires. Thus, used tire management programs in Canada have a high scope of convergence (many doing the same thing).

However, the degree and direction of convergence varies in the western and eastern parts of Canada. The number of tires produced, current tire recycling, strength of the market, and also the distribution of incentives varies in provinces. The incentive varies for collection, processing and recycling sectors. The provinces and territories with less population and less generation of used tires such as Northwest Territories, Yukon, Nova Scotia, Saskatchewan, PEI and Newfoundland, where the scale of the tire problem is not the same as eastern provinces, have no regulations to restrict the landfilling of used tires (Environment Canada, n.d). Tire retailers in these regions also collect tire levies and then submit their funds to the tire board which uses it for recycling, but there are no incentives provided to the collectors, transporters or processors. However, in other provinces, that generate a high volume of scrap tires such as British Columbia, Alberta, Quebec and Manitoba, the provinces have developed programs to divert used tires from landfills and established recycling programs with incentives.



The provinces in Canada adopted similar tire management programs in response to solving a similar kind of problem. Implementing a tire program helped them in achieving their existing waste management goals. However, differences between these programs also exist. Currently, Saskatchewan is the only province to cover the collection of ORT (Off- the-Road Tires: heavy mining, agricultural and industrial tires including farming and airplane tires) in their tire recycling program. The tire management program being proposed for Ontario is also considering including ORT. Thus, even though the basic approach adopted by all the provinces in Canada for the development of their tire management programs is very similar, the provinces have implemented their programs with modifications that best suit their conditions and individual requirements.

It remains, however, that Ontario is the only province that does not have a comprehensive tire management program. It will be interesting to see if the tire management program currently being considered for Ontario will adopt a similar approach to other provinces. Some modifications will certainly be needed if the province is to successfully deal with the huge accumulation of scrap tires. In the next section, recent initiatives taken by the government of Ontario are reviewed to assess the likeliness of implementing a similar program.

## **9.0 Initiatives taken by the Government of Ontario for Tire Management in 2008**

In 2008, Environment Minister John Gerretsen asked WDO to develop a used tire program for Ontario (MOE, 2008, pg 1). He directed WDO to develop a program that will recycle 90% of Ontario's used tires and cleanup existing tire stockpiles as quickly as possible. The program should be self-funding (MOE, 2008, pg 1). It will be interesting to

see whether the program to be implemented in Ontario will also be able to claim and prove cost-recovery, given that it has to deal with a high volume of stockpiles as well. Considering other provincial experiences, particularly Quebec's, it is valuable to consider this recent move in Ontario in relation to how and under what conditions other provinces established tire management programs.

As explained by Knill (2005), policy convergence may be evaluated based on the similarity of the problem faced by the jurisdictions. The degree and scope of convergence that is observed will also depend on how similar and significant the problem is in the regions. Jurisdictions that are similar and face the same type of problem are likely to adopt similar policies. In this case, Quebec is a useful focus. Quebec receives a large number of used tires from Ontario to be used as TDF in cement kilns (Environment Canada, 2004). Hence, Quebec is not only dealing with its own used tires but also Ontario's.

At the beginning of the tire management program in Quebec, the provincial government was providing complete funding for the program. Given the large number of tires the province produces each year, it was a big financial burden on the government. At that time all other provinces who had started a tire management program had implemented a tire levy and hence, in 1999 Quebec also implemented a tire levy. Ontario did introduce a tire levy in 1989 but after its cancellation by the NDP government in 1993, no Ontario government took the initiative of starting a tire management program. Both provinces, Ontario and Quebec, had huge tire fires in 1990, but Quebec responded to the problem by starting a tire recycling and management program and has been successful in cleaning up the stockpiles across the province. Ontario did take some

initiatives for clearing up illegal stockpiles but in the absence of a comprehensive tire management program, unlike in Quebec and other provinces, it is still facing significant tire disposal problems. However, a similar kind of program is now under consideration for Ontario.

Ontario has to confront several industry and political challenges in the process of developing and adopting a tire recycling program. The biggest challenge is that there is no accurate information on the millions of stored tires all across the province. In March 2008, the government decided to reserve \$200,000 to prepare an up-to-date inventory of tire stockpiles (MOE, 2008). Even today, when Ontario is working on developing a tire recycling program, it is politically challenging for the Liberals because opposition parties are trying to label it as a broken promise of not raising taxes. MP Tim Hudak (PC-Niagara West-Glanbrook) accused the premier of imposing a new tax and called it a Liberal tax grab (The Canadian Press, 2009). The NDP condemned the government's initiative suggesting that industry should be the one paying the tax rather than the consumers otherwise tire manufacturing industries will not move towards developing new methods for better design and easy recycling (Canadian Press, 2009). They welcomed the plan but criticized the government of Ontario for not holding good records of meeting waste diversion goals (The Canadian Press, 2009).

The political opposition and resistance from Ontario's tire industry is still there, but given the significance of the problem the strength of this opposition to a new management regime is changing – a point considered in more detail in the next section. Premier McGuinty, who did oppose the tire fee proposed by the WDO in 2005, has now agreed and admitted that the negative impacts of these tires on our environment and

health should be addressed (Benzie, 2008). The plan under the *Waste Diversion Act* 2002, Ontario Regulation 84/03 has already been approved and is under the implementation stage (OTS, 2009).

### **10.0 Interpreting Ontario's Action**

In this paper it is argued that the provinces in Canada were confronted with a similar issue of scrap tires. They had waste management goals in place and since implementing a tire management program helped them in achieving their existing goals, they adopted similar policies for scrap tires. Ontario's new proposed program is also very important as it provides an opportunity to address a longstanding tire management challenge in the province. The likelihood of Ontario's implementation of the new program depends on the fit between existing policy arrangements and the future implications of the incoming policy (Lenschow et.al, 2005). British Columbia had a waste management goal in place to divert 50% of its waste from landfills due to related health and environmental concerns and establishing a used tire program fitted well within its existing policy structure for the BC solid waste management program. From a policy perspective, tire management was part of a broader waste management goal. All the provinces in Canada at the time were faced with the problem of high volume of used tires generated annually along with the existing stockpiles without any sustainable means to handle them. The scrap tires were not only creating health and environmental concerns but were also a challenge in accomplishing the goal of existing waste diversion policy. On the other hand, costs and benefits also influence the choice of policy instrument.

Tire management programs in the provinces claim to provide major funding for the program from the tire tax, hence, these programs are likely to be cost neutral but this is not verifiable. As also suggested by Essadiqi and Pehlken (2005) in their report on “Scrap tire recycling in Canada”, differences and discrepancies in scrap tire generation and processing in Canada could be explained by the fact that the data published by Rubber Association on scrap tire generation is an estimate and not exact in theory and practice. Second, there is always some gap in the number of tires whose fate is unknown and are not part of the statistics (Essadiqi and Pehlken, 2005).

As suggested by Knill (2005), the simplest way for assessing policy convergence is to evaluate the extent to which jurisdictions have adopted similar policy over time. British Columbia was the first province in Canada (second to Ontario) to introduce a tire levy and to establish a tire program followed by Alberta in 1992. In 1993, when Quebecers started the tire program, it was second largest producer of scrap tire in Canada. Recyc-Québec was responsible for supporting and managing the program. No tire fee was legislated until after six years in 1999 when a \$3 levy was introduced with stricter regulations. Hence, these programs were started in isolation of other provinces and this provincial policy convergence was a result of similar but independent responses followed by lesson drawing from earlier provinces to a similar problem. On the other hand, Ontario diverged when all the other provinces converged due to the distributional conflicts between the provincial stakeholders and provincial reluctance to impose a new tax on citizens.

In Ontario, the current tire management is essentially a market driven industry. It is strongly influenced by manufacturers and retailers. Ontario been the largest importer of

Canada's tires and consequently the biggest contributor to scrap tires generated annually. Unlike other provinces, it already has an existing tire collection setup greatly controlled by manufacturers and tire retailers. Tire retailers and manufacturers have argued that there is no need for a tire program when Ontario already has an efficient tire management system (Gillespie, 2008). However, most of these tires end up being disposed of in an environmentally unsafe manner. In Ontario's current tire industry setup, residents and businesses pay retailers a tire fee of about \$5 to manage these used tires when they are removed. Each time tires are passed from one party to the other, from retailers to waste management companies to the haulers to the recyclers or landfill operators, there is a cost charged for each service. The major flaw in this system is that choices are made by each stakeholder on the basis of lowest costs possible, not the environment, so most of the Ontario tires end up in cement kilns in Quebec or are exported to the U.S. where they are burned to be used as Tire Derived Fuel (TDF). This creates shortage of supply of used tires for processors and recyclers in the province to be turned into other useful rubber products (Leslie, 2009). Ontario's current tire management system is driven by the lowest-cost option. While, Ontarians have not been receptive to another tax and the Premier has been reluctant to impose such a tax, the absence of a comprehensive tire management program in Ontario is imposing unknown environmental, health and financial costs and burdens, and missing an opportunity to produce economic and environmental benefits demonstrated by other provinces.

## 11.0 Key Findings

In Canada, in the case of tire management, provinces adopted similar programs because they were faced with the same problem of managing their scrap tires in an environmentally responsible way and it also helped them in achieving their existing waste diversion goals. However, Ontario is unique because of the lack of industry and political support and reluctance from Ontario's provincial government to introduce another tax. This reluctance was due to its unsuccessful experiences in past and its failure to manage scrap tires while a tire tax existed. This is consistent with the context of comparative public policy that jurisdictions facing similar problems adopt similar policies. But each jurisdiction has unique conditions/contextual factors that influence policy making and outcomes within that jurisdiction. The historic~~of~~ evolution of policy developments in a given jurisdiction, therefore, are important when trying to determine why certain actions are taken. However, the historical patterns and reasons for particular policy responses in a jurisdiction do change with time. A tire recycling program is now under consideration for Ontario and it is very likely that the province will also have a comprehensive tire management program similar to those implemented in other provinces in Canada given the need to address scrap tires, the public appetite for initiatives that have human health and environmental benefits, and potential economic benefits too.

## 12.0 Conclusion

The disposal of scrap tires is a significant problem in Ontario today. It is the only province in Canada without a strong tire management program. The large number of tire fleets (manufacturer's, retailers, dealers and importers) and the strong character of the domestic stakeholders in Ontario along with the political opposition amount to a huge gap in the implementation of a tire policy between Ontario and all other provinces and territories in Canada. In this paper, it is argued that Ontario's reluctance in adopting a similar kind of program as in other provinces is because of the fact that it has the largest number of tire fleets registered in the province indicating its strong economic strength with respect to the automobile industry and also due to the existing tire industry setup in Ontario. While a tire collection system exists in Ontario, the benefits of recycling and reusing those tires are not gained in Ontario, and most of these tires are disposed of in an environmentally unfriendly manner. A fee is charged at each stage of processing and the revenue generated is not used towards managing these tires in a responsible way and therefore most of these tires are burned, sent at a landfill or are illegally stockpiled or dumped (Gillespie, 2008a).

In 2008, the government of Ontario directed WDO to prepare a plan for Ontario. The plan will address stockpiles in the province and will be self-funded as implemented in other provinces. This implies that Ontarians will also have to pay a tire fee each time they buy a new tire, but this fee will be used to support a reuse and recycling program, as well as stockpile cleanup. Political leaders who opposed the program earlier (like Premier McGuinty) have agreed that scrap tires are a growing concern for Ontario and the issue should be addressed. Some other elected leaders are still criticizing the program but the



government of Ontario is now committed to developing the new program. The Environment Minister, John Garretson said in an interview, "It's unacceptable that Ontario is the only jurisdiction in Canada that doesn't have (a tire recycling program) right now and that's why we want to get one going as quickly as possible" (Gillespie, 2008)b.

It is unfortunate for Ontario not to have a scrap tire program given the fact that it is the biggest contributor towards the scrap tire problem in the country. The minister has already approved the proposal by WDO. In addition to providing an explanation of the gap between Ontario and other provinces in Canada in relation to tire management, the comparison of Ontario and other provinces illustrates how the tire industry, along with provincial reluctance to impose new taxes, can directly influence a government's willingness to introduce new regulation or law even if it is thought to be of high importance. In fact, lack of industry and political support along with the government being reluctant, usurped the goals and benefits of tire management in Ontario while other provinces moved ahead.

This paper also explains the causes of convergence between other provinces in Canada in tire management. All other provinces in Canada adopted similar kinds of policy because they were faced with the same kind of problem and the new policy fit well within their existing goals for waste and tire management. It helped them in achieving their waste diversion goals of diverting 50% of their waste from landfills. Initially, Quebec chose a different policy instrument towards achieving its goal but then as part of lesson drawing and harmonization (role played by CCME), it also adopted a similar policy approach by implementing a tire levy after six years of its program

implementation. Therefore, the tire management policies in Canada have high scope of convergence but with varying degree and direction of convergence as these programs still vary in their complexity (Table 3). Ontario is likely to follow other provinces this time, further increasing the scope of converge. When a tire levy was implemented in Quebec it resulted in stricter regulations and thus with an upward direction of convergence. It will be interesting to see if the implementation of the tire program in Ontario will also be followed by stricter regulations.

Table 3: Degree and direction of convergence

<b>Eastern Canada</b>	<b>Western Canada</b>
Incentives based programs	Non-incentive based programs
Eligible tires does not include ORT (considered for Ontario)	Eligible tires include ORT (Saskatchewan)
High generation of scrap tires	Less generation of scrap tires
High volume of stockpile	Less volume of stockpile
Strict regulations with regards to burning and landfilling of scrap tires	No or less strict regulations with regards to burning and landfilling of scrap tires

The case of tire management is an important issue in the study of comparative environmental policy as it shows that jurisdictions with similar problems adopt similar policy but each jurisdiction has unique contextual factors that affect policy making and outcomes in each jurisdiction. The history of policy evolution also plays an important role in defining, explaining and predicting a policy outcome in a jurisdiction. As seen in Ontario, even when everything seems lined up to promote a jurisdiction to move in a particular policy direction, the important contextual factors that are unique to a specific jurisdiction may prohibit that jurisdiction from acting the way one would think would be

obvious. In this case, government reluctance along with industry and political opposition explain the long delay in the implementation of a tire management program in Ontario. But, Ontario is likely to converge as a similar new policy is now under consideration for Ontario showing that the contextual factor affecting the policy making and outcome do change with time.

Like other provinces, a tire tax is likely to be implemented in Ontario and the structure of the tire management program is also expected to be very similar to other provinces. OTS while preparing a plan for Ontario did review used tires diversion programs in other provinces to learn from their best practices in place (OTS, 2009). Hence, convergence for Ontario is part of lesson drawing and harmonization. This initiative will provide Ontario with both economic and environmental benefits. Establishing an effective scrap tire management program is a highly complex process as it requires interactions between diverse stakeholders including manufacturers, dealers, collectors, processors, product end users, environmental regulators, and enforcement agencies. Due to the strong character of the domestic stakeholders in Ontario, WDO and OTDA (Ontario Tire Dealer Association) will have to work closely and co-operatively for the complete success of the program.

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