

# Analysis of Ontario's Five Point Clean Air Plan

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## Executive Summary:

On June 21, the Ontario government announced a five-point action plan to reduce industrial air pollutants. According to the government, the five-point plan for cleaner air includes:

1. Applying tough nitrogen oxide (NO<sub>x</sub>) and sulphur dioxide (SO<sub>2</sub>) limits -- two of the most significant smog-causing pollutants -- to more industrial sectors than ever before.
2. Making the NO<sub>x</sub> and SO<sub>2</sub> limits even stricter in future years.
3. Setting tough new air standards, in some cases for the first time, for 29 harmful pollutants, including carcinogens and toxins that could pose a threat to human health.
4. Achieving a better picture of industrial emissions through updated technology.
5. A faster, risk-based approach to implementing new air standards.

This plan contains two policy packages. The first is a set of pollution limits and an emissions trading system for industrial emitters of nitrogen oxides and sulphur dioxide (points 1 and 2 above). The proposed Industrial Emissions Reduction Plan (IERP) is essentially an extension of the NO<sub>x</sub> and SO<sub>2</sub> caps and emissions trading system developed for the electricity sector in 2001 to other industrial sectors.

The second policy package (points 3-5 in the 5 point plan) is a new regulatory framework to govern emissions of air toxics from industrial sources. This package includes a much-needed update of the thirty year old air dispersion modelling system to assess compliance with standards. More controversial, however, is the combination of moving to effects-based standards and risk-based approach to implementation and enforcement of these new standards and air dispersion modeling. Traditionally, point-of-impingement standards for air toxics have been set at levels based on primarily technological and/or economic criteria. The new approach looks to shift to "effects-based" standards set at the (usually much lower) level determined to be protective of human and/or environmental health. Off-setting these tougher standards is a 'risk-based approach' to implementation and enforcement which means that facilities will be able to seek temporary exemptions from these tougher standards if compliance would cause unacceptable levels of economic hardship.

The principal findings of this analysis of Ontario's proposed Clean Air Plan are:

- The proposed Industrial Emissions Reduction Plan does extend NO<sub>x</sub> and SO<sub>2</sub> limits to more industrial sectors. Previously, only electricity generators were capped.
- Industry is not being asked to do its fair share to reduce air pollution. Ontario has committed to reducing NO<sub>x</sub> emissions by 45% relative to 1990 levels by 2010, but industrial emissions are only being reduced by 17%. Sulphur dioxide limits are only reduced by 13% relative to current levels by the 2010-14 period. Under the proposed 'tough' new limits, pollution levels would be reduced at a slower rate between now and 2010 than what occurred in the 1990 – 2001 period.

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- Emissions allowances – which represent a highly valuable public good (clean air) - are distributed free of charge to polluters based on historical emissions, with a large quantity set aside for new plants or expansions of existing plants.
- A major weakness in the Industrial Emissions Reduction Plan is the inclusion of the other industrial sectors in the emissions trading program designed for the electricity sector. Under the current rules, most of the reductions in air pollution due to the planned phase-out of Ontario's five coal-fired electricity generators could be sold to other industries in Ontario or the U.S., allowing them to increase emissions above their supposed 'caps' and undercutting the health and environmental benefits associated with the coal phase-out.
- The emissions trading system also allows companies that aren't subject to pollution limits (including companies in 12 U.S. states) to create 'emission reduction credits' that can be sold to companies that do have limits, allowing these companies to emit pollution at a level up to 33% above their nominal 'cap'.
- The adoption of the U.S. Environmental Protection Agencies air dispersion models in place of Ontario's 30 year old model for determining compliance with point-of-impingement standards and the shift to effects-based standards, which put limits on emissions of air toxics based on their health effects are positive interim steps. Ontario should ultimately move away from point-of-impingement standards in favour of an approach which looks at total ecosystem loading.
- The shift to a risk-based approach to the implementation and enforcement of these tougher standards may undercut their effectiveness. It could also overload enforcement capacity, particularly if it becomes reliant upon local communities and public health agencies to monitor and enforce these measures without providing resources to do so effectively.
- All of these changes will require effective monitoring and enforcement in order to provide a credible threat of serious consequences for failing to comply with environmental regulations. Budget cuts at the Ministry of Environment – which was already significantly cut over the last nine years – could make all of these regulations meaningless.
- Measures to reduce NOx and SO2 can also reduce greenhouse gas emissions.

### **Recommendations:**

To provide an incentive for further reductions and continuous improvement under the Industrial Emissions Reduction Plan, the provincial government should:

1. Lower the caps by reducing the quantity of emission allowances.
2. Auction some or all of the emissions allowances in order to generate revenues to fund monitoring and environmental improvements while creating an economic incentive for polluters to reduce beyond their maximum allowable emission levels.
3. Prohibit the trading of emissions allowances or credits of smog precursors (the preferred option).
4. If there is emissions trading:
  - Remove the electricity sector from the trading system and specify instead that all new electricity generators must achieve emissions levels per megawatt hour equal to or less than those from best available high-efficiency natural gas technology.
  - Eliminate the creation of emissions credits from uncapped sources.
  - Limit the rest of the trading system to Ontario-based sources (i.e. no international or interprovincial trading).

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- Include mechanisms to protect local air quality from adverse impacts of trading (e.g. the creation of hotspots where facilities in highly impacted areas trading their way out of reductions).

With respect to the new regulatory framework for air toxics:

5. Adopt the U.S. EPA's air dispersion modeling for determining compliance with air standards and move to health-based standards for air toxics, as proposed, as positive interim steps.
6. In the longer term, move away from point-of-impingement standards and towards health-based standards that look at total ecosystem loading.
7. The proposal needs much more specific criteria for exemptions, including:
  - Risk Criteria: Needs to be much stronger floor in terms of acceptable health risks
  - Technological criteria: Need to be able to demonstrate that no technology exists (including process change and product redesign) that would allow a facility to meet the required emission standard.
  - Economic criteria: Need to demonstrate facility not viable if compelled to adopt prevention/control technology. In the case of technological and economic criteria, the risk/health criteria must override. If unacceptable health/environmental risks and no technologically or economically viable options for the facility, then the facility reduce production or close.
8. To prevent exemptions from becoming the norm and to ensure a level playing field in the risk assessment process for those facilities seeking exemptions, the government should place the burden of proof on polluters seeking exemptions from the new standards. This would include ensuring that facilities seeking exemptions from the health-based standards:
  - Make appropriate funding available to local public health unit and/or community organizations to hire consultants of their choice to review facility proposals.
  - Publish notices in newspapers of general circulation in host communities from the Ministry that the facility is requesting an exemption from standards via a 'risk-based' approach.
  - Make all materials related to the request publicly available.
  - Be granted a maximum 5-year, one-time exemption, with annual reports on progress made available to the public.

## **PART ONE: ONTARIO'S INDUSTRIAL EMISSIONS REDUCTION PLAN**

The proposed Clean Air Plan contains two major policy packages. The first of these is a set of pollution limits and an emissions trading system for industrial emitters of nitrogen oxides and sulphur dioxide.

The proposed Industrial Emissions Reduction Plan (IERP) is essentially an extension of the NO<sub>x</sub> and SO<sub>2</sub> caps and the emissions trading system developed for the electricity sector in 2001 to other industrial sectors. The extension of pollution caps to other industrial sectors is partially a response to criticisms of Ontario's emissions trading system for electricity generators, but in practice there is a large loophole in the proposed system related to the government's stated intention to phase out Ontario's coal-fired electricity generators that could allow industrial polluters to increase emissions.

Even without the trading provision, however, the new NO<sub>x</sub> and SO<sub>2</sub> caps are not as 'tough' as advertised.

### **Emissions Caps**

The proposed Industrial Emissions Reduction Plan limits emissions of NO<sub>x</sub> and SO<sub>2</sub> from large emitters within the petroleum refining, iron and steel, pulp and paper, glass, carbon black and cement sectors and reduces these emissions over time. Previously, only the electricity system faced both NO<sub>x</sub> and SO<sub>2</sub> limits, while Inco and Falconbridge faced SO<sub>2</sub> caps.

In order to comply with the Canada Wide Standard for ground-level ozone, Ontario has committed to achieving a 45% reduction in NO<sub>x</sub> emissions from 1990 levels by 2010. Emissions will only be reduced by 17% relative to 1990 levels by 2010, which means that more will have to be done to reduce NO<sub>x</sub> emissions from the transportation sector (the largest source of NO<sub>x</sub> emissions). Moreover, NO<sub>x</sub> levels are already 12% lower than 1990 levels, so reductions relative to 2001 levels (the most recent data available) are projected to be a modest 5% by 2010 and 9% by 2015 (see Table 1).

There is a similar story with regards to sulphur dioxide reductions, at least with regard to pre-2015 reductions (see Table 2). Current emissions of SO<sub>2</sub> for non-ferrous smelters were already 84 kilotonnes below the former SO<sub>2</sub> cap of 365 kilotonnes, so if we use actual emissions rather than regulated limits. Under this Plan, SO<sub>2</sub> emissions are only required to be reduced by 13% relative to current levels in the 2010 – 2014 period. A larger cut (51%) is required by 2015, in line with the recommendations of the Acidifying Emissions Task Group in 1997.

In summary, the majority of the proposed emission reductions have already been achieved and the 'tough' new targets actually envision a slower rate of improvement than what has occurred since 1990 (with the exception of the more substantial post 2015 reductions in SO<sub>2</sub>). This represents a major lost opportunity, and the proposed IERP does not incorporate any incentive to reduce beyond the level of these caps.

### **Recommendation:**

Lower the caps by reducing the quantity of emission allowances to ensure that industry does its fair share to fight smog and acid rain.

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**Table 1: NO<sub>x</sub> emissions cap proposed by MOE June 21/04 (all figures in kilotonnes)**

Sector	1990	2001	Proposed Emission Budgets			
			2006	2007-09	2010-14	2015+
Petroleum	14.4	10.4 (-28% from '90)	11.9	11.0	10.2 (-2% from '01) (-29% from '90)	10.2
Iron & Steel	15.7	12.7 (-19% from '90)	12.8	11.8	10.9 (-14% from '01) (-31% from '90)	10.9
Pulp & Paper	8.9	6.8 (-24% from '90)	6.9	6.5	6.2 (-9% from '01) (-30% from '90)	6.2
Glass	2.1	2.1	2.1	2.0	1.8 (-14% from '01 & '90)	1.8
Cement	17.9	19.7 (+10% from '90)	20.3	18.6	16.9 (-14% from '01) (-5.5% from '90)	14.8 (-17% from '90) (-25% from '01)
New Source Set Aside			3.1	3.1	3.1	3.1
<b>Total</b>	<b>59</b>	<b>51.7</b> (-12% from '90)	<b>57.1</b> (-3% from '90) (+10% from '01)	<b>52.9</b> (-10% from '90) (+2% from '01)	<b>49.0</b> (-17% from '90) (-5% from '01)	<b>46.9</b> (-21% from '90) (-9% from '01)

**Table 2: SO<sub>2</sub> Emission Caps proposed by MOE June 21/04 (all figures kilotonnes)**

Sector	1990	2001	Proposed Emissions Budgets			
			2006	2007-09	2010-14	2015+
Petroleum	57.0	58.7 (+3% from '90)	54.8	44.8	34.9 (-39% from '90) (-41% from '01)	34.9
Iron & Steel	38.7	18.5 (-52% from '90)	19.0	17.8	17.2 (-56% from '90) (-7% from '01)	17.2
Pulp & paper	9.1	7.5 (-18% from '90)	7.6	6.6	5.8 (-36% from '90) (-23% from '01)	5.8
Cement	16.6	21.0 (+27% from '90)	22.2	21.2	19.6 (+18% from '90) (-7% from '01)	15.7 (-5% from '90) (-25% from '01)
Carbon Black	11.0	9.5 (-14% from '90)	11.0	10.4	10.7 (-3% from '90) (+13% from '01)	10.7
<b>Subtotal w/out smelters</b>	<b>132.4</b>	<b>115.2</b> (-13% from '90)	<b>114.6</b>	<b>100.8</b> (-24% from '90)	<b>88.2</b> (-33% from '90) (-23% from '01)	<b>84.3</b> (-36% from '90) (-27% from '01)
Non-ferrous smelting	365 (regulated cap)	281 <sup>2</sup> (-23% from 1990 cap)	331 (-9% from '90) (+18% from '01)	241 (-34% from '90) (-14% from '01)	241 (-34% from '90) (-14% from '01)	91 (-75% from '90) (-68% from '01)
New Source Set Aside			17.1	17.1	17.1	17.1
<b>Total</b>	<b>497.4</b>	<b>396.2</b> (-20% from '90)	<b>462.8</b> (-7% from '90) (+16% from '01)	<b>359.1</b> (-28% from '90) (-9% from '01)	<b>346.3</b> (-30% from '90) (-13% from '01)	<b>192.4</b> (-61% from '90) (-51% from '01)

<sup>2</sup> In 1985, under the Countdown Acid Rain program, non-ferrous smelters had their SO<sub>2</sub> emissions capped (265 kilotonnes for Inco and 100 kt for Falconbridge). In the IERP background document, this regulated limit is included in the table as their regulated limit for 2001, but according to Environment Canada's National Pollution Release Inventory actual emissions in 2001 from Inco only 242.7 kt and 38.3 kt for Falconbridge. The 281 kt actual emissions are used here rather than the 365 kt regulatory cap in order to give a more accurate picture of environmental improvement.

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### **Emissions Allowances and the Emissions Trading System**

Emission allowances are 'permits to pollute', i.e. they entitle the corporation who owns them to release harmful substances into our environment that cause smog and acid rain. As such, they represent a valuable public resource. While it is difficult to predict what the price of NO<sub>x</sub> in Ontario would be in advance of seeing the final market design and how integrated it is with the U.S. trading program, these credits are extremely valuable. Given that the 2004 price of NO<sub>x</sub> in the U.S. northeast under the NO<sub>x</sub>-SIP Call trading system has averaged Cdn\$3,915/tonne,<sup>3</sup> the 57,100 tonnes allocated for 2006 would be worth over \$200 million if they were all sold at that price.

There is also an indirect, but very real, cost associated with this allowances. Because they represent the legal right to pollute the air with contaminants that cause smog, acid rain and climate change, there are significant environmental and health costs associated with their use. The Ontario Medical Association has estimated that the direct health and economic costs of ground-level ozone and particulate matter (for which NO<sub>x</sub> and SO<sub>2</sub> are the primary precursors) are in excess of \$1 billion per year.<sup>4</sup> The industrial sectors capped under this program are also responsible for the majority of acid-rain causing emissions, which damage vegetation and aquatic habitats.

Furthermore, some environmentalists object to the transformation of environmental values (healthy eco-systems, clean air) into economic values (dollars), for this means that decisions will be made through the market by those who have the most money (corporations) rather than by those who are affected by pollution based on democratic decision-making processes.

Yet these allowances are to be distributed free of charge, based on historical levels of emissions. In effect, they are a transfer of current and future environmental values to industrial polluters. There is also a large quantity of emissions allowances 'set-aside' for distribution to new facilities or the expansion of existing facilities (6% of current NO<sub>2</sub> emissions and 4% of current SO<sub>2</sub> emissions are 'set-aside' in 2010, and these will be increased if existing plants shut down as the closed plant's allowances are added to the 'set-aside' allocation).

In discussions on the national greenhouse gas trading program, environmentalists pushed for the emissions allowances to be distributed via auction rather than given away for free. The money collected under such a system can be used to finance the regulatory system required to monitor emissions trading and other environmental programs. The auctioning of allowances also provides an economic incentive to go beyond the minimum. In response, the federal government has proposed allocating 85% of the greenhouse gas emission allowances in its national GHG emissions trading system for free, and auctioning the remaining 15%.

#### **Recommendation:**

Auction some or all of the emissions allowances in order to generate revenues to fund monitoring and environmental improvements, while creating an economic incentive for polluters to reduce beyond their maximum allowable emission levels.

Yet in contrast to smog and acid rain-forming gases like NO<sub>x</sub> and SO<sub>2</sub>, greenhouse gas emissions do not have any local impacts – they are equally dispersed around the globe. Allowing for emissions trading in pollutants with local impacts can create highly localized 'hot zones', also

<sup>3</sup> Source: [www.emissionstrading.com](http://www.emissionstrading.com). The number has been converted to Canadian dollars and metric tones.

<sup>4</sup> Ontario Medical Association, Illness Cost of Air Pollution (2000).

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known as 'sacrifice zones' where contamination is concentrated in one location and that population and ecosystem faces an unfair burden of illness.

Given the local health impact of NO<sub>x</sub> and SO<sub>2</sub> – and the generous allowances available to industry – there is no compelling reason to allow for emissions trading in smog-forming pollutants. By auctioning allowances, the government can create an economic incentive to reduce pollution levels below the capped levels, while ensuring that caps are not exceeded.

### **Recommendation**

Prohibit the trading of emissions allowances or credits for smog precursor gases.

If, however, the government does proceed with an emissions trading system for smog precursor gases, then at the very least it should address the loopholes in the emissions trading rules.

### **Loopholes in the Emissions Trading System for NO<sub>x</sub> and SO<sub>2</sub>**

There are four 'loopholes' in the emissions trading system that should be closed if the government chooses – contrary to the recommendation above – to proceed with emissions trading for NO<sub>x</sub> and SO<sub>2</sub>.

The major weakness of the proposed IERP is related to the extension of the emissions trading developed for the electricity sector to the other industrial sectors. In 2000, the U.S. and Canadian federal governments negotiated an Ozone Annex to the Canada-U.S. Great Lakes Air Quality Agreement that place limits on NO<sub>x</sub> emissions from the electricity sector in Ontario and the U.S. northeast.

In 2001, the previous government of Ontario adopted a hybrid emissions trading system which capped emissions from electricity generators, but allowed them to trade with the un-capped sectors who could create 'emissions credits'. This system was adopted in an attempt to comply with the requirements of the Ozone Annex. In essence, this trading system was designed to allow Ontario to continue operating its coal-fired electricity generating stations. It allocated generous NO<sub>x</sub> and SO<sub>2</sub> allowances to the electricity sector (see Table 3 below) on the assumption that the coal plants would continue to operate with some end-of-pipe technology put in place to 'scrub' out the capped pollutants (while increasing emissions of other pollutants such as mercury and carbon dioxide); if the scrubbers weren't enough, Ontario Power Generation (or successor companies) would be able to buy 'credits' from the un-capped sectors.

Both Environment Canada and the U.S. Environmental Protection Agency objected to Ontario's proposed emissions trading system because it allowed the capped sector (electricity generators) to trade with uncapped sectors (industrial and mobile sources), hence electricity generators could exceed their cap. In response, the Ontario government limited electricity producers exceeding their cap by more than 33% due to trading. This solution was also criticized by the U.S. EPA and Environment Canada, as well as numerous Ontario environmental groups, as inconsistent with the goals of the Ozone Annex.

However, the new government's commitment to phase out Ontario's coal-fired electricity generators by 2007 has dramatically altered the terrain for the emissions trading system. In 2001, Ontario Power Generation emitted 44.6 kilotonnes of NO<sub>x</sub> and 149 kilotonnes of SO<sub>2</sub>, with the vast majority of these emissions coming from its five coal plants. Under the existing trading rules, the electricity sector will be allocated 28 kilotonnes of NO<sub>x</sub> emissions allowances starting in 2007 and 131 kilotonnes of SO<sub>2</sub> allowances, so the sector would have to either reduce NO<sub>x</sub> emissions by

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16.6 kilotonnes and SO<sub>2</sub> emissions by 18 kilotonnes, or purchase a corresponding amount of emission credits from the uncapped sector (up to a maximum of 37 kilotonnes NO<sub>x</sub> and 174 kilotonnes SO<sub>2</sub>).

If the coal plants are phased out, however, emissions of NO<sub>x</sub> and SO<sub>2</sub> will be dramatically reduced. If the output from the coal plants are replaced through energy conservation and renewables, then all of these allowances (28 kilotonnes NO<sub>x</sub> and 131 kilotonnes SO<sub>2</sub>) will be available to be sold. If the plants are replaced by high-efficiency gas, then NO<sub>x</sub> emissions should be cut by approximately 90% while SO<sub>2</sub> emissions would be virtually eliminated. In either scenario, the unused allowances that would potentially be available dwarf the reduction requirements placed upon the other industrial sectors through the proposed Industrial Emissions Reduction Plan (see Table 3).

**Table 3: The Impact of the Coal Phase-out on Emissions Trading**

		Emissions Allocations to Electricity Sector	Estimated Electricity Sector Emissions (without coal plants)	Emission Credits Available to be Sold if Coal Plants are Closed	Credits needed by other Ontario Industry to meet proposed IERP caps <sup>5</sup>
2007	NO <sub>x</sub>	28	5	23	1.2
	SO <sub>2</sub>	131	0	131	37.1
2010	NO <sub>x</sub>	28	5	23	2.7
	SO <sub>2</sub>	131	0	131	49.9

Even if Ontario industry doesn't purchase all of these credits, they could potentially be sold to U.S. polluters, as the government has signaled its intention to integrate the Ontario trading system with the U.S. system.

This loophole in the trading system undercuts the environmental and health benefits anticipated from the coal phase-out announcement, as pollution reductions from the electricity sector could result in increases in other sectors or in upwind U.S. states. It is however, easily closed for the policy decision to phase out coal means there is no compelling reason to maintain an emissions trading system for the electricity sector, and a very compelling reason to eliminate it.

The second loophole in the emissions trading system is the ability of the capped sectors to trade with the uncapped sectors, thereby increasing real emissions from the 'capped' sectors above their nominal cap.

And there are lots of uncapped sources who could create and sell credits. In Ontario, not all industrial sources are capped; for example, the chemical sector emitted 11 kilotonnes of NO and 'other industry' emitted 24 kilotonnes of NO in 1999, but aren't capped.<sup>6</sup> Programs which reduce pollution from vehicles (e.g. Car Heaven) could also conceivably aggregate emissions reductions and sell them to industrial sources as emissions credits.

Nor is the creation of credits limited to Ontario sources. The trading rules allow emitters in the 12 key states named in the Ozone Annex (New York, Pennsylvania, New Jersey, Delaware, Maryland, West Virginia, Kentucky, Ohio, Michigan, Indiana, Illinois, Wisconsin) to create credits and sell them to Ontario's capped sectors. While it is true that down-wind sources do affect Ontarians, the

<sup>5</sup> These numbers are calculated from the data in Table 1 and 2 above by subtracting the proposed caps from current emissions.

<sup>6</sup> Government of Ontario, *Ontario's Anti-Smog Action Plan: Progress Through Partnership* (2002), p. 62.

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government of Ontario should not be creating a system whereby action in Ontario (such as the coal phase-out) allows downwind polluters to increase emissions.

In any case, it will be very difficult to verify whether these 'credits' represent real emissions reductions that go beyond business-as-usual, and even if they are real reductions in pollution, their beneficial effect is eliminated by allowing them to be sold as credits which simply result in increased emissions from Ontario's capped sectors.

If capped entities are allowed to trade allowances, there is still a need to address problems of local loading (i.e. 'hot' or 'sacrifice' zones). The trading system must have in place mechanisms to address situations where local air quality is unacceptable and to prevent degradation of existing good air quality via trading.

### **Recommendations:**

1. No emissions trading (the preferred option).
2. If there is emissions trading:
  - Remove the electricity sector from the trading system and specify instead that all new electricity generators must achieve emissions levels per megawatt hour equal to or less than those from best available high-efficiency natural gas technology.
  - Eliminate the creation of emissions credits from uncapped sources.
  - Limit the rest of the trading system to Ontario-based sources (i.e. no international or interprovincial trading).
  - Include mechanisms to protect local air quality from adverse impacts of trading (e.g. the creation of hotspots where facilities in highly impacted areas trading their way out of reductions).

## **PART TWO: THE NEW REGULATORY FRAMEWORK FOR AIR TOXICS**

The second proposed policy package in the government's 5 point Clean Air Plan is a new regulatory framework to govern emissions of air toxics from industrial sources. This package has three components:

- An update of the thirty year old air dispersion modelling system.
- Tougher standards for 29 air toxics as part of the shift towards "effects-based" standards that are based on levels determined to be protective of human and/or environmental health rather than on economic criteria.
- The shift to a 'risk-based approach' to enforcement.

In Ontario, air toxic standards are based on 'point-of-impingement' (POI) limits. Overall emissions from are source are not limited, instead the limits are set based on what concentration is anticipated to result from a particular source (e.g. a smokestack) that is a given distance away (the point at which the pollution impinges upon the community).

Point-of-Impingement standards have been critiqued for several reasons. First, by regulating concentrations a certain distance away, it allows industry to 'comply' with the regulation by simply building a taller stack and spreading the pollution over a greater area. This does not control pollution levels in the broader environment, but simply results in larger smokestacks each of which spreads its pollution further, 'impinging' upon more people. Secondly, POI standards limit pollution from one source at a time and don't account for the fact that there are many sources 'impinging' upon a given point, so that overall pollution levels may be above safe levels even if each source is within its limits. And thirdly, POI standards have proven difficult to enforce.<sup>7</sup>

### **Air Dispersion Modeling**

The new dispersion modeling is the least controversial aspect of the Clean Air Plan. As discussed above, many environmentalists are critical of the point-of-impingement standard itself, but if you are going to use point-of-impingement standards, you might as well use an accurate air dispersion modeling program.

Ontario is using a 30 year old dispersion model which is not very accurate, given the advances in air pollution science and computers in the last three decades. The U.S Environmental Protection Agency has developed an air dispersion model that provides a more accurate assessment of health and environmental impacts.

The Ontario Proposal is to adopt this model, and the Proposal also includes the possibility of including background levels in assessments<sup>8</sup>, which is a step forward in terms of looking at total loadings rather than single-source point-of-impingement.

The update of the air dispersion models for determining compliance with point-of-impingement standards is a positive step and should be supported.

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<sup>7</sup> For details, see David Estrin and John Swaigen, *Environment on Trial* (3<sup>rd</sup> Edition) (1993).

<sup>8</sup> Ministry of the Environment, Air Dispersion Modelling Guideline for Ontario: A Proposal for Consultation, (June 2004), p. 11.

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### **Health Effects-based Standards for Air Toxics**

Traditionally, point-of-impingement standards for air toxics have been set at levels based primarily on technological and/or economic criteria. This has resulted in 'lowest-common-denominator' standards, based on upon levels that the most polluting plants within the sector can achieve.

The shift to effects-based standards is a positive step from an environmental perspective. According to the Ministry of Environment, "Effects-based air quality standards are developed based on our understanding and interpretation of health and environmental effects, and do not address technological and economic issues."<sup>9</sup>

The specific proposal in the Clean Air Plan is to update the standards for 29 air toxics. The comparison for these standards is complicated by the move from ½ hour to one hour averaging periods, but in general they represent significant reductions (see Table 4 on the next page), and environmentalists generally support moving to health-based standards.

However, neither the better modeling program or the health-based standards will address the other limitations of a point-of-impingement approach noted above. Industry can still 'comply' by building bigger stacks, the new standards don't account for overall ecosystem loading as some 'points' will be 'impinged' upon by multiple sources, and legal prosecution under these rules is difficult. This is why, for example, the Countdown Acid Rain program adopted in 1986 used a total loading approach, i.e. looked at all the sources in order to see what kind of reductions were required from each in order to reduce the total load on the entire ecosystem to an acceptable level.

Hence, while the new modeling program and the effects-based point of impingement standards represent an advance over the former system and should be adopted as at least an interim measure, it may make sense in the future to move away from point of impingent standards altogether in favour of approaches which are more readily enforceable and look at total loadings on the ecosystem.

#### **Recommendations:**

Adopt the proposed U.S. EPA's air dispersion modeling for determining compliance with air standards and health-based standards for air toxics, as positive interim steps.

In the longer term, move away from point-of-impingement standards and towards health-based standards that look at total ecosystem loading.

### **A Risk-based Approach to Implementation and Enforcement of Air Standards**

In combination, the new dispersion modeling and standards could substantial reduce the allowable emissions of air toxics from Ontario industry. Since the standards no longer make allowances for technological or economic criteria, the proposal is to include these criteria in implementing and enforcing the new standards through a 'risk-based approach'.

A risk-based approach assumes that not all facilities will have to meet the new, tougher standard. Deciding which ones will be held to a less stringent standard is based on an assessment of the risk posed by letting them pollute at levels above the health-based standard.

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<sup>9</sup> Ministry of the Environment, *Proposed Guideline for the Implementation of Air Standards in Ontario: A Risk-based decision making process*, (June 2004), p. 5.

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**Table 4: Comparison of New and Old Air Standards**

Substance	Old Standard ( $\mu\text{g}/\text{m}^3$ ) <sup>10</sup>	New Standard ( $\mu\text{g}/\text{m}^3$ ) 1 hour concentration	Examples of industrial emitters
Acetone	48,000	29,700	Iron & steel, automotive, paints and varnishes, plastics and synthetics, rubber products
Acetonitrile	--	175	Plastics and synthetics, rubber products
Acrolein	23.3	0.2	Chemical production, leather tanning
Arsenic and compounds	1	No decision, but suggest current standard is 300x too high	Iron and steel, nickel/copper/zinc smelting, electric power
Cadmium and compounds	5	5	Non-ferrous metal refining, iron and steel, batteries
Chromium VI and III compounds	5	?	Plating, leather tanning, wood preservation
Cyclohexane	300,000	15,250	Paints & varnishes, petroleum & coal production, plastics & synthetics, rubber products
Di(2-ethylhexyl)phthalate (DEHP)	--	100	Automotive, paints and varnishes, plastics and synthetics, rubber products, pulp and paper
Di-n-octylphthalate (DNOP)	100	100	Plastics and synthetics, rubber products
Hexamethylene diisocyanate (HDI) monomer	1.5	0.075	Autobody refinishing
HDI biuret (HDI-BT)	3	2.5	
HDI isocyanurate (HDI-IC)	--	2.5	
HDI-BT and HDI-IC mixture	--	2.5	
Hexane	35,000	6,250	Grain and oil seed industry, food packaging, automotive products, petroleum products
Hydrogen cyanide	958	20	Non-ferrous mining and smelting
Hydrogen fluoride	4.3/8.6/17.2 depending on month	4.3	Non-ferrous mining and smelting, electricity power generation, petroleum and coal production
Isopropanol	24,000	18,250	Automotive, pulp and paper
Methane diphenyl diisocyanurate (MDI) monomer	3.0	1.75	Polyurethane foam manufacturing
Polymeric MDI		1.75	
Methylene chloride	5,300	550	Foam and expanded plastics, pharmaceutical manufacturing
Methyl isocyanate	--	2.5	Polyurethane foams and plastics
Nickel and compounds	5	5	Nickel production, petroleum refining, machinery and engine manufacturing
Phenol	83	75	Automotive, glass, iron and steel, petroleum and coal production
Tetrachloethylene (PERC)	10,000	900	Metal degreasing operations, dry cleaning
Trichloroethylene (TCE)	2875	30	Metal degreasing operations, adhesive coatings
Vinyl chloride	25	2.5	Plastics and synthetics, rubber products
Xylenes	2300	1,825	Gasoline and fuel manufacturing, ink, dyes, adhesives
2,4-Toluene diisocyanate	0.83	0.5	Polyurethane foam manufacturing

<sup>10</sup> Note some of these were guidelines rather than standards, and some were for a ½ hour concentration rather than 1 hour. Half hour concentration POI standards are usually 75% of the one hour concentration level.

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The proposed approach accepts that there is "a lower level below which risks are broadly accepted as being negligible (Broadly Acceptable Region), as well as an upper level or limit above which risks are considered intolerable (Intolerable Region). In between these two levels is a region where risks may be tolerable (Tolerable Region) only if risk reduction is impractical or if its cost are grossly disproportionate to the improvement gained (As Low As Reasonably Practical (ALARP) region)."<sup>11</sup>

The MOE intends to set air standards in the Broadly Acceptable Region, but make allowances for those firms unable to achieve these levels. According to the government's background document:

The Ministry of Environment recognizes that the introduction of new or revised air standards and models means that not all facilities will be able to achieve compliance with MOE air standards immediately due to technology limitations, economic realities and/or simply the need for more time to assess, plan, and if necessary, finance and install new equipment or processes to reduce ground-level concentrations (GLCs) and/or emissions. For some facilities, a reasonable phase-in period for new models and/or new/revised air standards would provide enough time to assess, plan, budget and implement technical solutions to ensure compliance with the air standards. For other facilities, assessments might demonstrate that compliance with the air standard might not be achievable within the proposed phase-in period, due to technical and/or economic barriers.

The recommended phase-in period for new standards would normally be 5 years unless otherwise prescribed by regulation. If a facility can identify feasible technical solutions that can be implemented within the phase-in period to achieve compliance, then it can proceed to do so (subject to the necessary approvals requirements).

If a facility demonstrates that compliance with the standard cannot be achieved by the end of the prescribed phase-in period, it is proposed that the facility could apply to the MOE to have a different standard apply to that facility for a certain period of time.

Barriers to implementing air standards may mean there is a need to establish interim site, sector or technology-based limits for some period of time with the goal of continuous improvement toward achieving the effects-based standard. Whenever the Regulation is amended to impose a new or revised standard or a new model, any facility identifying implementation barriers may apply to MOE to have a different standard apply to it for some period of time (e.g. site, sector or technology based limits). If approval is granted, this decision would be periodically reviewed to ensure technical or economic issues considered at the time are still relevant for that particular facility. Facilities would be required to apply for these temporary or interim site specific standards within a prescribed time period once a new standard or model is introduced into the Regulation.

It is proposed that this time period be within one year following the date that the Regulation is amended. As part of this application, the risk-based decision making process outlined in this Guideline for the Implementation of Air Standards in Ontario would be considered. For example, in those circumstances where compliance with new models and/or new air standards cannot be achieved within the phase-in period, this risk-based decision making process would be used to address time, economic and/or technical barriers. This risk-based decision making process is founded on the following basic principles:

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<sup>11</sup> Ministry of the Environment, *Proposed Guideline for the Implementation of Air Standards in Ontario: A Risk-based decision making process*, (June 2004), p. 6.

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- Facilities have demonstrated that they are doing the best they can reasonably do today to reduce their emissions in order to comply with the standard;
- Public transparency: stakeholders are aware of the compliance issue and the associated potential health and/or environmental risks;
- The local community understands the options that were considered including the nature of the technical and/or economic challenges reviewed;
- The facility will be expected to develop and implement an action plan (subject to MOE approval) that represents improvement of emissions (or GLCs) over time;
- The action plan will be revisited in a set period of time in order to ensure continual improvement and a re-evaluation of technical and economic considerations which evolve over time;
- An expectation that if the amount above the standard exceeds a prescribed risk threshold (see Section 2.3.4), then some minimum level of risk reduction must be implemented in order for that facility to continue operation at its current production level.<sup>12</sup>

Within the limitations of the point of impingement approach, the proposed framework does provide a more clearly defined structure to the process of standard-setting and implementation. It includes an assessment of health impacts and best available technologies, the development of an action plan by the company, and calls for community participation through stakeholder engagement with Medical Officers of Health and local environmental groups.

That said, there are still four major concerns with such an approach. First, it appears that the MOE is prepared to accept interim solutions that are several magnitudes greater than the health-based standard. In the background document (p. 16), the MOE indicates that interim solutions should not exceed a cancer risk of one in 10,000. Health-based standards usually have a cancer risk of one in 1,000,000 as a minimally acceptable level (i.e. 100 times stricter than the acceptable interim standard which could last indefinitely in practice). One in 10,000 does seem far too lenient, posing an unacceptable hazard to the community and most likely an even greater hazard to the workers in the plant. There also needs to be stronger criteria for technological and economic criteria, with a clear statement that the health and environmental risks will override technological and economic criteria.

### **Recommendation:**

The proposal needs much more specific criteria for exemptions, including:

- Risk Criteria: Needs to be much stronger floor in terms of acceptable health risks
- Technological criteria: Need to be able to demonstrate that no technology exists (including process change and product redesign) that would allow a facility to meet the required emission standard.
- Economic criteria: Need to demonstrate facility not viable if compelled to adopt prevention/control technology. In the case of technological and economic criteria, the risk/health criteria must override. If unacceptable health/environmental risks and no technologically or economically viable options for the facility, then the facility reduce production or close.

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<sup>12</sup> Ministry of the Environment, *Proposed Guideline for the Implementation of Air Standards in Ontario: A Risk-based decision making process*, (June 2004), p. 8-9.

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Secondly, the risk-based decision making process is clearly is a very time-intensive process which requires significant scientific and engineering expertise. Unfortunately, the MOE doesn't have sufficient personnel to police the existing system. The MOE has faced significant staff and budget cuts for environmental monitoring and enforcement over the last nine years, and it appears that further reductions will be required by the McGuinty government. While the Ministry of Environment's budget has been increased this year, most of that money appears to be allocated for implementation of the O'Connor Commission's recommendations on protecting water supplies.

The question that arises is: Will the necessary resources be made available, or will industries be granted exemptions because the MOE can't invest the time and resources required to properly assess the risks posed by the exemption or the possible improvements that could be achieved? Responding to a facility that challenges a standard would require the Ministry to either have or retain expertise in pollution control/prevention relevant to the specific type of facility in question. The Ministry would even be at a disadvantage because it won't have full access to the facility's economic and technical data.

Thirdly, the intention of involving the local community is laudable, but meaningless unless resources are available to allow genuine participation. In the absence of the capacity for independent research and critique of a company's plan, these risk assessment processes could become exercises in corporate 'greenwash', or become opportunities for 'job blackmail' where local industries threaten to close operations unless the community supports their exemption from environmental regulations. Local governments are far more vulnerable to this type of pressure – which is one of the reasons that provincial standards were developed in the first place.

Local health agencies are often already stretched to fulfill their provincially-mandated programs and may not have the capacity to deal with risk assessments of local industrial emissions which, as noted above, require very specific forms of expertise. Local environmental groups are even less likely to have the necessary resources.

Fourth, this new approach opens the door to the situation where different facilities in the same sector will be subject to different standards on the basis of their ability to make a case within a 'risk-based' approach. This is exactly the sort of problem that "standards" are supposed to avoid, and while it may be an improvement to have the standard set above the 'lowest-common-denominator' within a sector and force industry to make a case for why they can't comply with this tougher standard, the government should be prepared for legal arguments from some facilities that this represents an uneven playing field.

In short, the government is proposing to move to health-based standards rather than the

### **Recommendation:**

To prevent exemptions from becoming the norm and to ensure a level playing field in the risk assessment process for those facilities seeking exemptions, the government should place the burden of proof on polluters seeking exemptions from the new standards. This would include ensuring that facilities seeking exemptions from the health-based standards:

- Make appropriate funding available to local public health unit and/or community organizations to hire consultants of their choice to review facility proposals.
- Publish notices in newspapers of general circulation in host communities from the Ministry that the facility is requesting an exemption from standards via a 'risk-based' approach.
- Make all materials related to the request publicly available.
- Be granted a maximum 5-year, one-time exemption, with annual reports on progress made available to the public.

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former system based on best available technology that is economically achievable. The *quid pro quo* that the government is proposing to give to polluters is that they have the option of making a facility-by-facility case for a "risk-base" approach for exemption from the tougher standard. Yet if a large number of regulated facilities make requests for exemptions from the new standards (which is a strong possibility), then the Ministry and the public could simply be overwhelmed and the tougher standard becomes meaningless in practice.

It is also not clear if whether what is being proposed can actually be done via guidelines. The process for granting "risk-based" exemptions may need to be defined through regulation itself and any requests for exemptions granted by Cabinet.

### **The Clean Air Plan and Climate Change**

The major source of NO<sub>x</sub>, SO<sub>2</sub>, VOCs and greenhouse gases is the burning of fossil fuels in our homes, factories, electricity generating stations and vehicles. Measures which reduce emissions of NO<sub>x</sub>, SO<sub>2</sub> or air toxics (volatile organic compounds) will reduce greenhouse gas emissions directly (as ozone levels are reduced) and hopefully indirectly (as more efficient boilers and motors reduce fuel consumption and hence carbon dioxide emissions).

Measures which reduce one pollutant by installing an end-of-pipe solution like SO<sub>2</sub> or NO<sub>x</sub> scrubbers may actually increase greenhouse gas emissions as the overall fuel efficiency of the plant is reduced (i.e. more fuel is burnt to achieve the same level of production because energy is required to operate the scrubber). In developing air pollution reduction plans, corporations and governments should seek to promote measures which reduce multiple pollutants rather than one at the expense of all the others.

In particular, it is important to close the emissions trading loophole related to the coal phase-out. Otherwise, the greenhouse gas benefits from reducing coal use in electricity plants may be undercut as emissions (including greenhouse gases) rise in other sectors, particularly if emissions credits are traded to U.S. coal plants which face limits for NO<sub>x</sub> and SO<sub>2</sub> but not for carbon dioxide and hence could increase production.