



ENVIRONMENTAL DEFENSE

finding the ways that work

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BY OVERNIGHT DELIVERY

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Attention: EPA Public Docket No. A-2000-01

Re: EPA's Snowmobile Emission Standards (66 Fed. Reg. 51,098, Oct. 5, 2001)

Dear Mr. Fraas:

Thank you for taking the time to discuss EPA's snowmobile emission standards. The enclosed briefing book examines information – much of it generated by snowmobile manufacturers – demonstrating that cleaner, quieter snowmobiles engines with greater fuel economy are available now. We believe that should EPA fail to adopt more rigorous emission standards than those proposed, the Agency will contravene its delegated rulemaking authority and will miss an important opportunity to achieve cost-effective emission reductions in hydrocarbons and other airborne contaminants.

All Major Snowmobile Manufacturers Already Are Producing Cleaner, Quieter Snowmobiles (TAB 1). There are four major snowmobile manufacturers that account for 99% of all domestic sales. All four of these manufacturers have introduced new 4-stroke technology for either Model Year 2002 or 2003. At least three of the manufacturers will be releasing more than one model by 2003. TAB 1 of the briefing book contains documents produced by these four snowmobile manufacturers and niche publications about cleaner, quieter 4-stroke snowmobiles. Excerpts from these materials are set out below.

❖ *ARCTIC CAT*

From Arctic Cat Website, "Not just a new kind of snowmobile, it's a new kind of snowmobiling."

"Meet the sleds that challenge virtually every preconceived notion about our sport. More important, meet the sleds that offer a whole new way to enjoy the beauty of winter. If you want to experience nature, nature will barely notice your presence. Thanks to their C TECH 4 engines, they run quiet – so quiet, you'll hear the sound of the skis cutting through the ice and snow. They run cleanly and efficiently – averaging 20-25 mpg at trail speeds. They offer the convenience of electric start and run on straight regular-grade unleaded fuel. Both models feature our AWS V front suspension for a smooth ride and responsive handling. ... Introduced in limited numbers last year, they're in full production for 2002. Why not be the first to experience the future of our sport?"

❖ *BOMBARDIER*

From: "Bombardier to Showcase 4-Stroke Snowmobile Engine at 2002 Games"

"Bombardier introduced a concept Ski-Doo® snowmobile with a four-stroke engine that will be showcased at the Salt Lake 2002 Olympic Winter Games. The prototype 1000cc Rotax 4-TEC is the first V-configuration OEM four-stroke engine engineered exclusively for snowmobile use, and the most powerful snowmobile four-stroke to date."

"'Bombardier is committed to cleaner and quieter snowmobiling,' said José Boisjoli, President, Snowmobiles, Watercraft and ATV, Bombardier Recreational Products. 'We want to show the public that more environmentally-friendly – yet still fun to drive – snowmobiles are right around the corner.'"

* * *

"This 4-TEC is expected to reduce hydrocarbon emissions by 80 percent and increase fuel economy by 30 percent compared to conventional two-stroke snowmobile engines."

From Bombardier Website, Cleaner Engines

"Displacing 1000cc, the [4-TEC] V-1000 is the first four-stroke specifically designed for snowmobiles. Engine-builder Rotax is known throughout the world for its four-stroke expertise, especially with upscale German and Italian motorcycles."

❖ *POLARIS*

From Polaris Website, Frontier Classic

“The Frontier Classic is the ultimate fusion of engineering and luxury. It features the first twin-cylinder, fuel injected four-cycle engine designed specifically for snowmobiling – with a lower center of gravity that enhances stability and control on the trail. Not only does it offer a better ride, it’s also quieter, cleaner and more fuel efficient.”

From Polaris Website, Frontier Touring

“The Indy Frontier Touring sets new standards in comfort and quality. It’s powered by our 48 hp Polaris Liberty four-cycle multi-port EFI engine for effortless starting and clean, quiet operation. 20-25 MPG at trail speeds with an expanded size fuel tank mean the miles fly by without having to stop. . . . Based on the best-selling EDGE chassis, the Frontier Touring features the same new revolutionary EDGE Touring rear suspension found on our 700 Classic Touring, making it an ideal two-up or one-up cruiser.”

❖ *YAMAHA*

From Snowmobile online, Sled Review: “Yamaha’s 2003 RX-1, Mega Horsepower Four-Stroke!”

“Two-stroke motors have always been the choice for big power, reliability and light weight. The set back has been fuel burn efficiency and exhaust scavenging. This inefficiency has been used against us snowmobilers by the ‘Greenies’, so the manufacturers stepped up to the plate by introducing four-stroke engines. For the performance enthusiasts, these engines lack the power to do anything off the trail and indicating [sic] they would never own a four-stroke. Enter Yamaha Motors.”

“If any manufacturer could create a four-stroke engine that is light weight, reliable and generate some huge power it is Yamaha. Enter the 2003 RX-1.”

* * *

“The new RX-1 is definitely the new standard of future snowmobiles. You can now have the best of both worlds. Four-stroke efficiency with two-stroke power. Imagine no more pulling of the starter cord, no more adding two-stroke oil, and better gas mileage. Only a year ago anyone outside of the Yamaha development team would have said it could not happen. Who would of thought?”

“Can the other manufacturers step up to the plate? It looks like they have no choice. As I rub my crystal ball to predict the future... Ahh forget about the crystal ball, it sure did not pick up on Yamaha’s new four-stroke. The Yamaha dealers are going to sell a lot of RX-1’s this next season, period!”

From “Creating a New Category of Snowmobile: Yamaha RX-1” SnowTech (Sept. 2002)

This article from the September 2002 edition of *SnowTech* magazine examines the research and development that went into Yamaha's recent unveiling of its high-performance 4-stroke engine. The quotation below is from the R&D project leader:

"I'm sure that most people will really be surprised to see how small the engine is for a 4-cylinder and how compact we have been able to make the sled. One of the first things people will discover when they start up the engine is its appealing 4-stroke sound that comes from our unique exhaust system design. Then, when you accelerate you'll discover its awesome power. The aggressive response you get when you accelerate from the mid-speed range is out of this world. And, the overall riding comfort is quite good."

"You will find new enjoyment in riding this model with its exciting power more than ever before. There is also its light, nimble handling. Anyone who comes to our RX-1 with the preconception that a 4-stroke is heavy and has poor response are in for a big surprise."

Examples of Available Four-Stroke Snowmobiles

<p>Arctic Cat:</p> <ul style="list-style-type: none">• 4-stroke Trail:<ul style="list-style-type: none">○ 4-stroke engine○ 25-30 mpg○ also comes in a "Touring" model <p>http://www.arctic-cat.com/snowmobiles/index.asp</p>
<p>Bombardier (Ski-Doo):</p> <ul style="list-style-type: none">• Rotax 2-TEC:<ul style="list-style-type: none">○ Semi-direct injected 2-stroke○ 50% emission reductions○ 25% better fuel economy• Rotax 4-TEC:<ul style="list-style-type: none">○ 4-stroke engine○ 80% HC reduction○ 30% better fuel economy <p>http://www.ski-doo.com/SkiDoo2003/web/jsp/100_mainPage.jsp?Params=N.US.710.0; see also statement in narrative above</p>
<p>Polaris:</p> <ul style="list-style-type: none">• Frontier (a number of different models)<ul style="list-style-type: none">○ 4-stroke engine○ 20-25 mpg <p>http://www.polarisindustries.com/product/detail.asp?ContentID=03SNOTLUXFRONTIERCLASSIC and http://www.polarisindustries.com/product/detail.asp?ContentID=03SNOTWOXFRONTIERTOURING</p>
<p>Yamaha:</p> <ul style="list-style-type: none">• RX-1:<ul style="list-style-type: none">○ 4-stroke engine

- 20 mpg
 - rated best 4-stroke model in terms of power
- <http://www.off-road.com/snowmobile/reviews/2003/rx1/2003rx1.htm>

Small Snowmobile Manufacturers Also Are Producing Cleaner, Quieter Snowmobile Models (TAB 2).

There are a number of small manufacturers that tend to specialize in expensive, high performance designs. At least one of these “boutique” manufacturers is already advertising a 4-stroke model. As indicated in TAB 2 of the briefing book, Blade Snowmobiles is releasing a Model Year 2003 snowmobile called the Blade Venom: “BLADE Snowmobiles is ready to release Venom™ into the veins of the snowmobile industry, featuring gutsy, torquey, four-stroke, American made V-Twins by S&S, a cycling industry icon for more than 44 years that have earned their reputation at Bonneville and the leading dragstrips.”

The Reviews of New Cleaner 4-Stroke Snowmobiles are Favorable (TAB 3). TAB 3 contains articles from maximumsled.com, the Anchorage Daily News and the Bangor Daily News reviewing new 4-stroke snowmobile models.

- ❖ “*Stroke Me, Stroke Me 4-Stroke Madness*” from www.maximumsled.com

“While 4-strokes have been used on snowmobiles in the past, the technology for improved performance, lighter weight and cost reduction is there.”

“Yes, I like the power-to-weight ratios of my 2-strokes, but I like the economy and longevity with the low oil consumption of the 4-stroke. The technology is young with a lot of room to grow, so if it means that I have to ride a 4-stroke ten years from now or give up snowmobiling, then by all means, stroke me.”

- ❖ “*Just One Word – Incredible! Yamaha Introduces the four-stroke RX-1*” from www.maximumsled.com

“When we first saw the RX-1, it blew us away. However, we did not realize that the ride would be even more incredible. To imagine that the fastest and most powerful sled we’ve ridden would be a four-stroke was not even in our realm of thinking. And then to include excellent trail manners, a comfortable ride and radical new looks that are sure to draw crowds at each pit stop – well, we were sold. And you will be too.”

“If someone told you your next sled would be a four stroke, you’d probably scoff at the idea. With the RX-1, this is not only possible but could be very probable. Your next sled may very well be a four-stroke – and you’ll love it! Yamaha’s crystal ball shows this technology to be the future of snowmobiling and we could not agree more. There is simply nothing else like it and that is what makes the new Yamaha RX-1 so incredible!”

- ❖ “*New, quiet snowmachines use little gas; Arctic Cat, Polaris offer fuel-efficient models with get up and go.*” [Anchorage Daily News](#) (Jan. 27, 2002).

“Less than five years ago, snowmobile industry engineers were claiming the technology just wasn’t there for a clean, quiet four-stroke snowmobile. It would be too heavy, they said; it would be too slow; it would be unmarketable.”

“The [Polaris] Frontier squelches those arguments. It is the first step toward making the most practical vehicle for transportation in the Alaska Bush more like the automobile urban Alaskans use to meet their daily transportation needs.”

“With Polaris and Arctic Cat four-strokes trail machines already on the market, with Yamaha unveiling a hot-rod four-stroke sled, and with Ski-Doo about to offer up an all-new four-stroke as the official snowmobile of the Winter Olympics in Salt Lake, the future is here.”

- ❖ “*Snowmobile sales clean up; Four-stroke engines popular*” Bangor Daily News (Dec. 29, 2001)

“While several snowmobile dealers around the state said they would wait to see how the first four-stroke sleds sell before buying any, Maine dealers selling them already have the answer, because most have sold out of them.”

* * *

“Yet if the sales in Maine at the start of the winter are any indication, four-strokes are here to stay.”

“On Thursday, Elwood Tidd was waiting for his first Polaris four-stroke to arrive at his store, Tidd’s Sport Shop in Houlton. He wasn’t sure how fast it would sell but he was happy to have it.”

“‘People have liked the two-strokes for so long,’ Tidd said. ‘But the four-strokes will catch on because they are economical.’”

Collegiate-Level Engineering Students Have Demonstrated that 2-Stroke Direct Injection Snowmobiles With Catalysts Can Achieve Considerable Emission Reductions and Operate More Quietly (TAB 4). TAB 4 of the briefing book contains a report on the 2002 Society of Automotive Engineers Clean Snowmobile Challenge. The greatest emission reductions in the competition were achieved by a direct injection 2-stroke engine:

“In perhaps the biggest surprise of the competition, the [Colorado State University] two-stroke shocked the field by winning the emissions portion of the event. The direct injected, catalyst fitted two-stroke reduced CO emissions by 99.4% and hydrocarbon output by 88.6%, compared to the control snowmobile. The CSU sled was just one decibel shy of passing the competition’s strict noise standard, and fell out of the running for the top prize.”

* * *

“Colorado State University brought a snowmobile featuring a 594 cc Suzuki two-stroke engine modified for direct injection and outfitted with a catalyst. Their groundbreaking entry in the competition took home the third place trophy and the award for Best Emissions. Their impressive emissions performance has received notice from third world countries – where the two-stroke motorbike is the preferred method of transport and the air quality suffers.”

Likewise a Technology Review in the September 2002 Issue of *SnowTech Magazine* Indicates that 2-Stroke Engines Are Being Developed to Meet EPA’s New Emission Standards (TAB 4).

TAB 4 contains a copy of this article which finds that both 2-stroke and 4-stroke engines are on parallel development paths to meet EPA’s emission standards:

“Today, in the glow of raves over Yamaha’s four-stroke RX-1 snowmobile, it seems as if the two-stroke engine is being left behind in the rush to meet exhaust emissions standards.”

“That is an illusion. Effective two-stroke emissions-control technologies not only exist, but are in production and being actively developed. With these technologies, the two-stroke is transformed into a fuel-efficient, low-emissions power source. The question of whether to meet design goals with two-stroke or four-stroke has become entirely an economic one, answered by a given manufacturer’s needs (and capabilities).”

“While Ski-Doo has shown a 1000-cc V-twin four-stroke snowmobile engine and a related three-cylinder four-stroke watercraft unit, they are also producing two-stroke sled engines that are expected to meet upcoming emissions levels through use of what the company calls Semi-Direct Injection (SDI). Yamaha’s success with four-stroke technologies has not stopped that company from continuing to produce and develop its HPDI (High Pressure Direct Injection) technology for its large two-stroke outboard engines.”

“In other words, two-stroke and four-stroke are parallel paths by which to reach low emissions levels.”

Snowmobiles are a Major Source of Deleterious Hydrocarbon Emissions, Especially in Microenvironments (TAB 4).

Snowmobiles are significant contributors to local and national hydrocarbon inventories, emitting about 200,000 tons annually. U.S. EPA, *Draft Regulatory Support Document: Control of Emissions from Unregulated Nonroad Engines*, September 2001, at p. 6-26. The adverse health and environmental effects of hydrocarbons are exacerbated by the deleterious impacts that can occur in microenvironments. Those individuals that operate, work, recreate or are otherwise in the vicinity of snowmobiles for significant periods of time face particular risks. For example, University of Denver researchers found that during the 1998-99 season, more than 62,000 snowmobile and 1300 snow coach trips entered Yellowstone National Park. The researchers estimated that snowmobiles accounted for 77% of annual emissions of hydrocarbons and 27% of annual emissions of carbon monoxide.

EPA Has A Legal Duty To Establish Emission Standards That Reflect Cleaner Snowmobile Engine Technology (TAB 5).

TAB 5 contains an Environmental Defense-spearheaded environmental coalition letter to Governor Christine Todd Whitman and EPA General Counsel

Robert Fabricant in which we explain that the failure of the Agency to adopt more rigorous emission standards for hydrocarbons and carbon monoxide, whether by tightening the proposed phase 1 and 2 standards or establishing a phase 3 standard, will contravene EPA's delegated rulemaking authority under the federal Clean Air Act.

A Durable Well-Designed Labeling Program Is Sound Public Policy (TAB 5). A well-designed labeling program can empower consumers, including second-hand consumers, to make informed decisions about the environmental impacts of their purchase and thereby create important market-based incentives for cleaner snowmobiles. Indeed, information disclosure is eminently sound public policy. EPA's proposed labeling program would limit labeling to dealership hang tags on vehicles meeting the proposed Blue Sky voluntary standard. By limiting consumer labeling to hang tags, dealers can selectively display or remove tags, as they desire. Further, the retail purchaser will almost certainly dispose of the hang tags. Therefore, hang tags alone are an ineffective tool to provide the durable transparency necessary for informed consumer decision-making.

A program that requires permanent labels on all snowmobiles will ensure that all consumers have access to meaningful air quality information when purchasing a new or used snowmobile. In addition, a multi-tiered and comparative labeling program is imperative. By employing labels that disclose comparative pollution levels, consumers can make more informed decisions. California's comparative multi-tiered labeling program for personal marine vessels provides a blueprint for federal program design. Likewise, the European Union has done intensive consumer testing and market research on fuel economy labels for passenger cars. This research shows that a comparison of a specific car's fuel consumption to those of other cars is critical. Such labels send powerful market signals to vehicle manufacturers and reward cleaner engine design. An effective, well-designed consumer labeling program can harness market forces to achieve significant emissions reductions and reward those manufacturers that produce cleaner snowmobiles. Information on both the California Watercraft Labeling Program and the EU Analysis is set out in TAB 5 of the briefing book.

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Thank you for your consideration of our views and please do not hesitate to contact us at 303-440-4901 if we can be of further assistance.

Respectfully Submitted,

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Enclosures