CONSULTATION REGULATION IMPACT STATEMENT

REDUCING EMISSIONS FROM NON-ROAD SPARK IGNITION ENGINES AND EQUIPMENT

Prepared by Yamaha Motor Australia Pty Ltd

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1. INTRODUCTION

The necessity to decrease air pollution has been recognised by the marine engine manufacturers for many years.

It has been well understood that unless marine engines achieve acceptable levels of air pollution their existence as a source of propulsion for water craft is threatened.

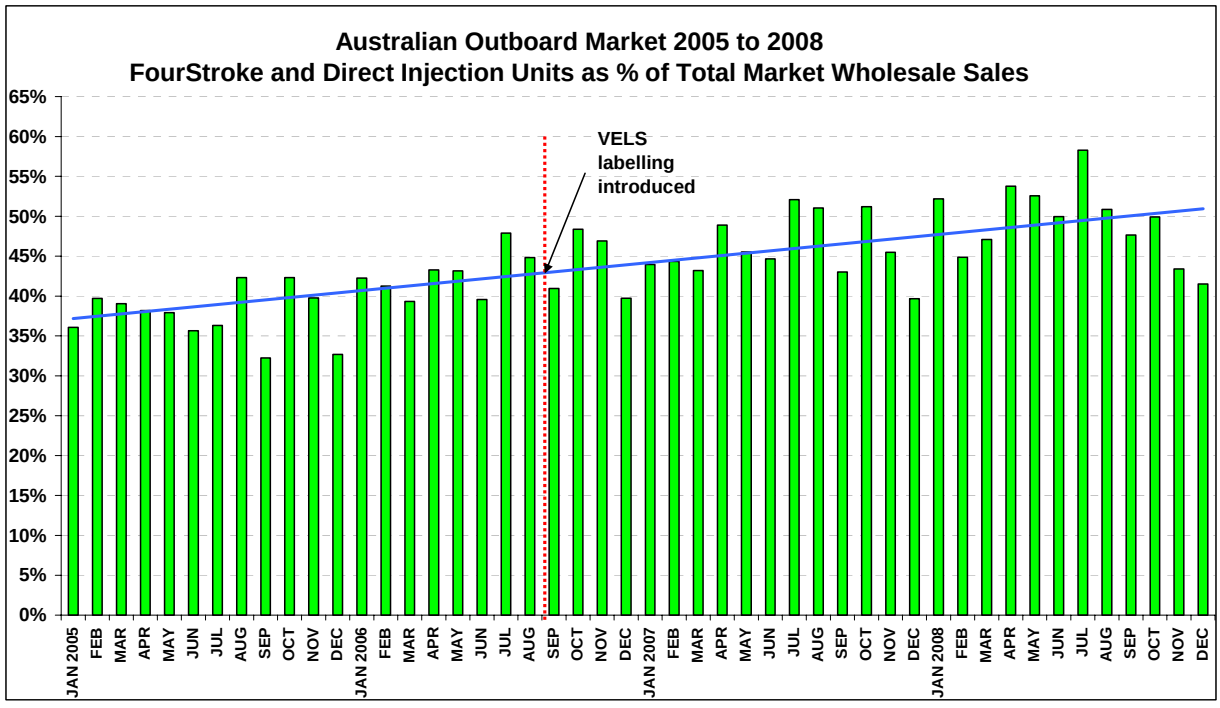
To that end, enormous resources have been expended in the development of clean engines.

The largest markets for recreational marine engines have always been the USA and Europe. So most of the research and development has occurred in these countries, where the effect of the development of clean engines will have the greatest impact on reducing global emission levels.

While not a main target market, Australia has benefited from the development and introduction of these clean engines.

The increasing availability of these engines allowed the industry to introduce the Voluntary Engine Labelling Scheme (VELS) in January 2007. Under this scheme the emission levels for each engine are identified to allow customers to make an informed choice of outboard engine type.

Figure 1



Note - RIS document references Outboard market data to 2005 only. Above data for 2005 to 2008 supplied by OEDA and includes all 6 major manufacturers.

Since VELS was introduced, the proportion of clean engines has grown significantly. More detailed results will be discussed in Section 3.

It is clear that under VELS the level of emissions has decreased significantly (a minimum of 43% in Yamaha's case) – way ahead of any of the governments stated goals and in a much shorter time frame.

Beyond VELS, Yamaha is supportive of a regulatory solution to further decreasing air pollution from outboards. However the timing of the introduction of these regulatory measures is of prime importance in the Australian market.

A phased introduction of existing and proposed international regulations into Australia is recommended to take into account the following circumstances:

- The different operating conditions of outboards in Australia, compared to Europe and USA with regard to the environment, density of boating and actual usage times.
- The lack of regulation in the past leading to a position where boat builders need time to adapt their product to accept the full range of clean outboards.
- Specific user groups such as indigenous fisherman and older recreational users who find it impractical to use the new technology engines in their current design formats.
- The capacity of the manufacturers to change their production forecasts and schedules over a short period.
- Removing certain engine categories from the market in a short period will leave gaps in the product line up that can not be filled by currently available clean engines for reasons outlined above and explained in more detail in Section 7. This will have a debilitating effect on small business that service the industry with a knock on affect of lost government revenue and lower employment rates.

This response to the RIS will seek to provide data and information that will enhance the scope of the RIS, enabling DEWHA to better evaluate the introduction of emission legislation.

2. THE PROBLEM

The RIS highlights the problem of air pollutants and the resultant health impacts deriving from non-road spark ignition engines in Australia.

In Australian urban environments, non-road engines contribute 3% to 7% of CO and VOC emissions.

This estimate was made in 2007. Since then the product mix of two-strokes to four-strokes has changed. This change of product use in outboard engines and PWCs has created a lower contribution to the emissions from these products.

It is also arguable that outboard and PWC use is away from urban areas (compared to lawn and garden equipment, light commercial equipment etc). So the influence from these products is reduced in comparison to other non-road products.

Of the total non-road emissions, recreational and commercial marine contributes 5% of CO emissions and 7% of VOC emissions.

Given that these figures were compiled in 2005, the mix is now reduced from the percentages represented in the RIS. Section 3 will highlight the changes in outboard emissions since 2005.

Based on the 2007 and 2005 data of the RIS, the emissions from marine engines contributed between 0.15% and 0.35% of CO and between 0.21% and 0.49% of VOC emissions.

With 43% reductions in emissions already achieved since 2005, the impact of further reductions will contribute little to the overall air pollution in Australian urban areas.

This statement does not diminish Yamaha's commitment to the introduction of emission legislation but it does highlight our contention that introducing legislation in a phased manner will have very little negative impact on the outcome.

3. THE CASE FOR GOVERNMENT INTERVENTION

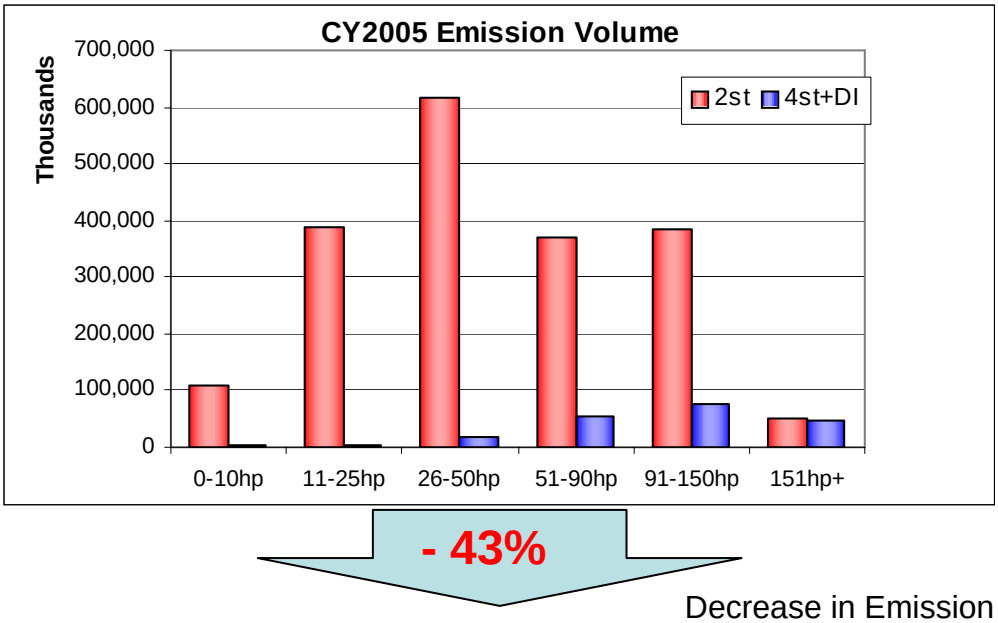
The following information updates the progress of emission reduction for Yamaha outboards for the period 2005 to 2008.

Figure 2

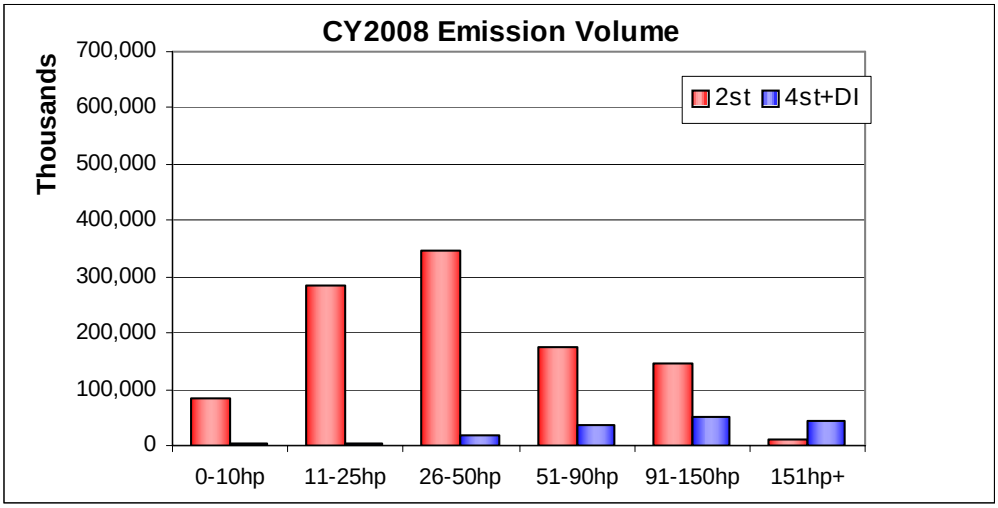
Based on annual usage of 26HRS 2-Stroke and 28HRS 4-Stroke

2005 **Emission (HC+NOx (g))**

	2st	4st+DI	Total
0-10hp	107,838,390	2,193,406	110,031,796
11-25hp	388,108,717	3,656,201	391,764,918
26-50hp	615,557,164	18,207,297	633,764,461
51-90hp	368,812,050	54,610,796	423,422,846
91-150hp	385,175,216	77,109,698	462,284,914
151hp+	50,581,594	48,100,959	98,682,554
Total	1,916,073,131	203,878,358	2,119,951,489



Decrease in Emission volumes



2008 **Emission (HC+NOx (g))**

	2st	4st+DI	Total	vs 2005
0-10hp	82,486,802	1,940,498	84,427,300	-23%
11-25hp	285,323,133	3,284,355	288,607,488	-26%
26-50hp	345,040,924	17,586,914	362,627,838	-43%
51-90hp	176,508,304	37,948,156	214,456,460	-49%
91-150hp	145,584,487	51,120,177	196,704,664	-57%
151hp+	11,317,816	42,234,470	53,552,287	-46%
Total	1,046,261,466	154,114,570	1,200,376,036	-43%

NOTE: The above is based on an average usage of 26 hours for two-strokes and 28 hours for four-strokes. While these usage numbers have been used widely, Yamaha believes the real usage figures for small engines are much lower.

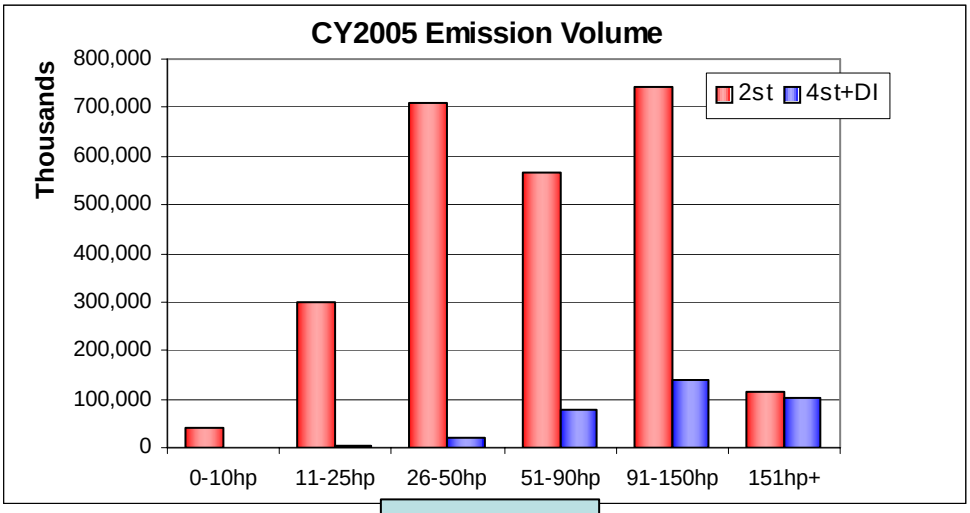
An in depth survey needs to be conducted to confirm this but anecdotal information points to more usual figures of around 10 hours for engines in the lower HP range up to 60 hours for the larger HP. If these usage figures were applied then the decrease in emissions would be even more significant.

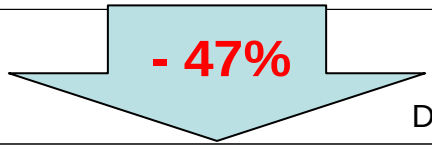
Figure 3

Operation hours adjusted to more realistic usage

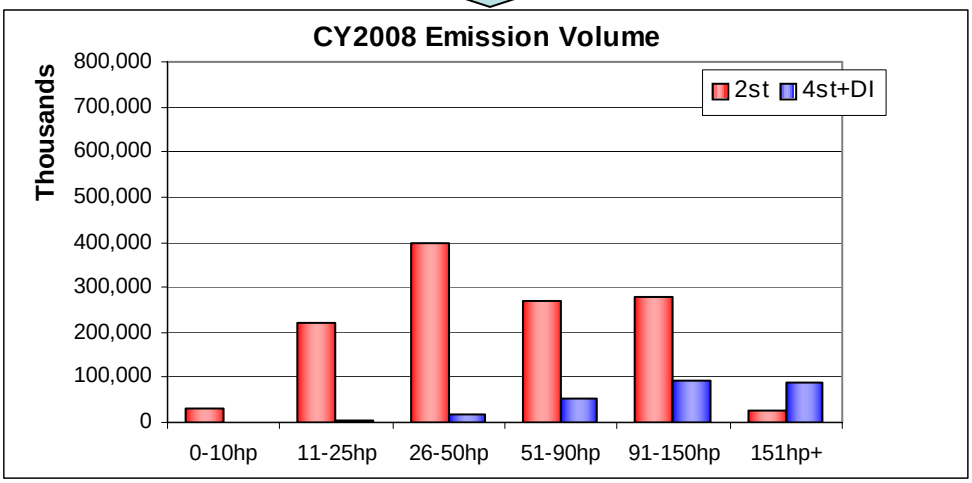
2005 **Emission (HC+NOx (g))**

	2st	4st+DI	Total	Operation Hours (hr)
0-10hp	41,476,304	783,359	42,259,663	10
11-25hp	298,545,167	2,611,572	301,156,739	20
26-50hp	710,258,266	19,507,818	729,766,084	30
51-90hp	567,403,154	78,015,423	645,418,577	40
91-150hp	740,721,570	137,695,890	878,417,459	50
151hp+	116,726,756	103,073,484	219,800,240	60
Total	2,475,131,216	341,687,546	2,816,818,763	28





Decrease in Emission volumes



2008 **Emission (HC+NOx (g))**

	2st	4st+DI	Total	Operation Hours (hr)	Emission vs 2005
0-10hp	31,725,693	693,035	32,418,728	10	-23%
11-25hp	219,479,333	2,345,968	221,825,301	20	-26%
26-50hp	398,124,143	18,843,122	416,967,265	30	-43%
51-90hp	271,551,237	54,211,651	325,762,888	40	-50%
91-150hp	279,970,168	91,286,030	371,256,198	50	-58%
151hp+	26,118,038	90,502,437	116,620,474	60	-47%
Total	1,226,968,611	257,882,243	1,484,850,854	28	-47%

As illustrated above, with more realistic usage applied (still averaging 28HRS) a reduction of 47% has already been achieved from 2005 - 2008. Over the coming years as new technology becomes available further dramatic reductions are expected even under BAU conditions.

On Page 11 of section 3 of the RIS it is stated that *"Australian jurisdictions would need to reduce ambient levels of a specified pollutant(s) by an agreed percentage, eg by 20%."*

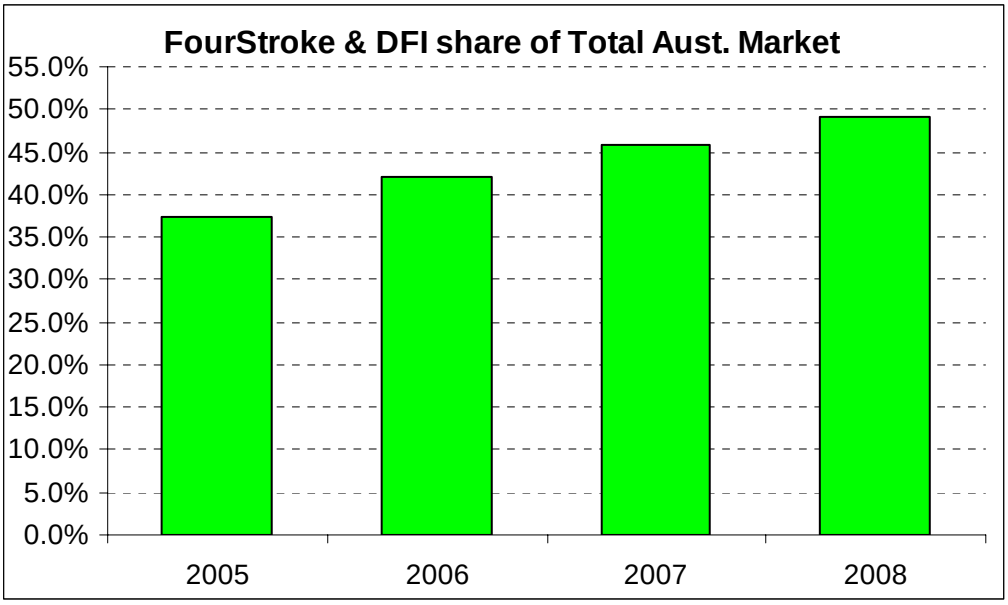
Sales of Outboard Engines by Technology

An update of the information in figure 3.1 in the RIS for the whole of the industry is illustrated in Figure 4:

Figure 4

Australian Outboard Engine Sales by Type per Year

Year	**2005**	**2006**	**2007**	**2008**
2-Stroke	30028	26733	25119	20264
Direct Injection	2959	3710	4989	4412
4-Stroke	14950	15791	16168	15157
Total Wholesale Units	**47937**	**46234**	**46276**	**39833**
FourStroke & DFI %	37.4%	42.2%	45.7%	**49.1%**



The update clearly shows that the uptake of clean technology has accelerated beyond the figures shown in the RIS.

This further strengthens the case to phase in any emission legislation in a way that does not cause unnecessary hardship for consumers and industry while continuing an aggressive move to "clean" engines.

4. OBJECTIVES

Yamaha agrees with the objectives stated in the RIS. Action already taken by Yamaha has surpassed all government stated objectives for air pollution reduction.

5. SELECTION OF FEASIBLE OPTIONS TO ACHIEVE OBJECTIVES

Yamaha supports the establishment of emission standards based on the USA EPA standards. USA EPA recognises that manufacturers, distributors, dealers and customers need some flexibility in meeting these new regulations.

EPA uses Averaging, Banking and Trading (ABT) to provide manufacturers with a way to comply with the regulation and still maintain a product line. Engines and equipment that can be certified below the standard generate emissions credits and engines that are over the standard consume credit. Each manufacturer must maintain a positive credit balance.

In addition, there are caps on the emission levels of any given engine family to prevent high polluters from being placed on the market. For outboards, the cap is at the equivalent of the CARB 1 Star Standard.

There are no actual engines certified to the 1 Star level, so the ABT program is simply averaging 2 and 3 Star level engines and the fleet average is the 3 Star level or better. This is important because statements that have been made that large numbers of high polluting engines could be dumped on the Australian market if ABT was allowed in Australia. With the caps in place, this is not true.

DEHWA has stated that at no time would regulations be more stringent than that introduced in to the USA. However, The USA regulations have been discussed with the marine industry in that country for nearly 15 years and even now some components to be adopted are still being developed. Further, Australia has stated it will not allow Averaging, Banking and Trading (ABT), a critical component for the US manufacturers which if not introduced in Australia will severely reduce the range of engines allowed into this country.

6. EMISSION STANDARD - PROPOSED MODEL FOR ADOPTION.

Yamaha Motor Australia suggest the below model for the phasing out of large 2-stroke engines for the Australian market.

With the differences between the Australian European and US usage patterns and market size outlined previously in this response, we strongly suggest the following table for the phased implementation of clean technology engine.

1. December 31st 2015 – 90HP and above, only low emission engines to be imported.
2. December 31st 2016 – 61HP and above, only low emission engines to be imported.
3. December 31st 2017 – 26HP and above, only low emission engines to be imported.
4. 0 to 25HP exemption (this would allow organizations such as Surf Lifesaving, military services, retired travellers and other small boat users that require light weight simple engines for their boating needs.
5. Low emission engines are classed as up to 64.8 g/kwH of HC + NOx, as listed in table 5.1 page 17 of the RIS.

7. IMPACT ANALYSIS OF FEASIBLE OPTIONS

Impact on Current Users

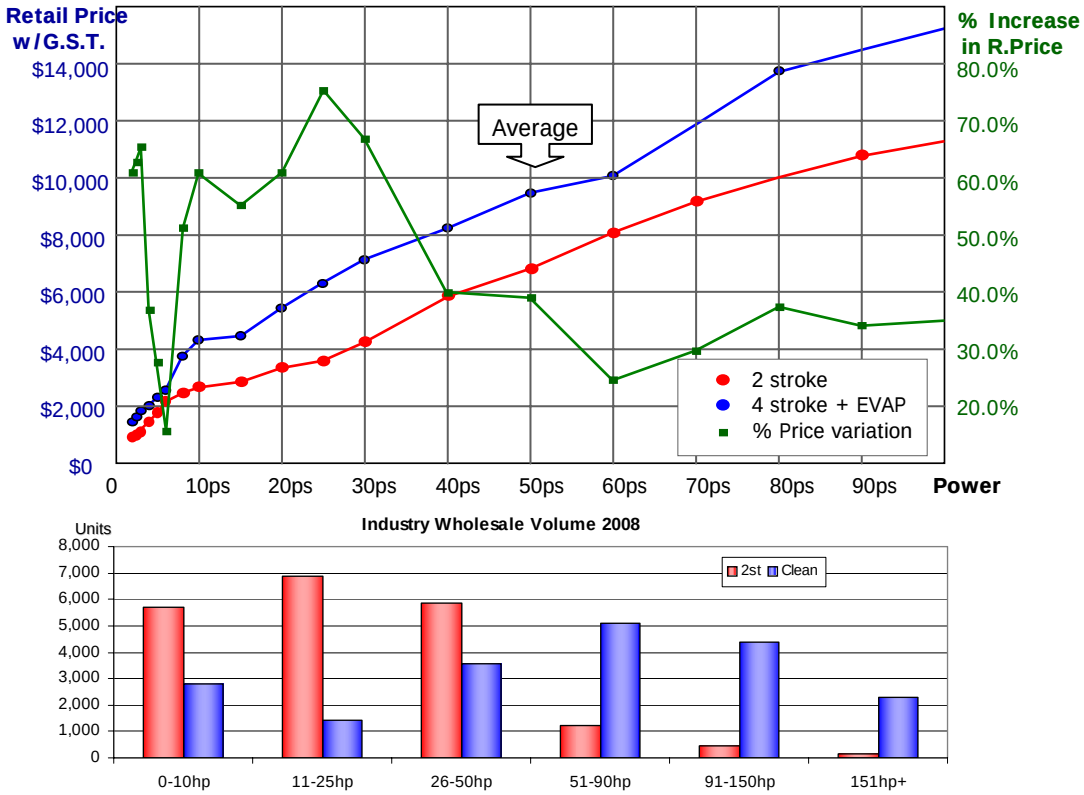
One of the most obvious barriers to the introduction of clean engines across all user groups is cost.
Certain user groups, eg older users, retirees, indigenous groups, lower wage earners and entry level users will experience financial hardship if faced with choosing cleaner engines before price parity is achieved at the manufacturing base.

The following graph indicates the current pricing issues facing such users:

Figure 5

Yamaha Retail Price Comparison 2-stroke vs 4-stroke

Customer bears approx. 40 % higher cost when switching from two stroke outboard motor to four-stroke



All the above mentioned groups tend to purchase outboards in the lower horsepower bracket, EG 2HP to 50HP. The graph clearly indicates that the price differential is highest in this HP spread. It also indicates that this range contains a large volume of engines.

The multiplying factors of high price differential and large volume clearly indicate that this user group will suffer more than other users if emission regulations are introduced without sufficient lead time.

While the group contains a larger than average proportion of two-strokes, the impact of these higher emission engines is mitigated somewhat by the lower usage patterns of this group.

Another factor that will disadvantage these user groups is one of extra weight Figure 6 illustrates the weight difference between 2-strokes and the “clean” engines from 2HP to 50HP.

In this HP range the majority of engines are portable and in many instances the engines are separated from the boat when not in use. It is unreasonable and impractical to expect older users, female users and entry level users to safely carry the extra weight.

As the weight of new technology engines improves over time, the weight difference will become closer. This time is yet to arrive so the phased in approach with exemptions on some HP models will reduce the impact on users & business.

Figure 6

Australian Market Comparison of 2-Stroke with 4-Stroke Outboard Product Weights

* All weights expressed in kilograms

* Data collated from manufacturers websites and F&B magazine - July 2010 issue

Horsepower	Mercury 2-Stroke	Mercury 4-Stroke	Yamaha 2-Stroke	Yamaha 4-Stroke	Tohatsu 2-Stroke	Tohatsu 4-St or DI	Suzuki 2-Stroke	Suzuki 4-Stroke	BRP 2-Stroke	BRP 2-St DI	Honda 2-Stroke	Honda 4-Stroke
2.0			16.5									12.2
2.5	13.0	19.0		17.0	12.5	17.5		13.0				
3.0			16.5									
3.3	13.0											
3.5		19.0			12.5	17.5						
4.0	20.0	25.0	21.0	28.0	19.0			25.0				
5.0	20.0	25.0	25.0	28.0	19.0	25.0		25.0				27.0
6.0	26.0	25.0	27.0	28.0	26.0	25.0		25.0				
8.0	26.0	38.1	27.0	38.0	26.0	37.0		39.5				42.0
9.8					26.0	37.0						
9.9	35.0	38.1	36.0	39.0	41.0		38.5	39.5				
10.0	34.0											42.0
15.0	35.0	50.0	36.0	51.0	41.0	52.0	38.5	44.0				46.5
18.0					41.0							
20.0		52.3	48.0	51.0		52.0						46.5
25.0	51.0	71.0	48.0	78.0	52.0	68.5		69.0		66.0		72.5
30.0	51.0	78.0	54.5	99.0	52.0	68.5	57.5			66.0		72.5
40.0	69.0	98.0	80.7	99.0	85.0	96.0	76.0	110.0		105.0		98.0
50.0	93.0	112.0	86.0	110.0	85.0	96.0		110.0		109.0		98.0

Horsepower	Median Values 2-Stroke	Median Values 4-Stroke	Difference Weight	Difference %
2.0	16.5	12.2	-4.3	-26%
2.5	12.8	17.3	4.5	35%
3.0	16.5			
3.3	13.0			
3.5	12.5	18.3	5.8	46%
4.0	20.0	25.0	5.0	25%
5.0	20.0	25.0	5.0	25%
6.0	26.0	25.0	-1.0	-4%
8.0	26.0	38.1	12.1	47%
9.8	26.0	37.0	11.0	42%
9.9	37.3	39.0	1.8	5%
10.0	34.0	42.0	8.0	24%
15.0	37.3	50.0	12.8	34%
18.0	41.0			
20.0	48.0	51.5	3.5	7%
25.0	51.0	70.0	19.0	37%
30.0	53.3	72.5	19.3	36%
40.0	78.4	98.5	20.2	26%
50.0	86.0	109.5	23.5	27%

EVAP Standards

Introducing the new EVAP standards at the same time as the proposed outboard emission standards would create problems for the boat builders as well as for the outboard manufactures. Australian Boat Builders have yet to respond or even grasp the implications of the proposed legislation. In the USA where builders have been working on this for some time, solutions are only just being developed. It will be a significant period before such changes are possible for the local industry. Yamaha believes the EVAP standards need to be handled as a separate issue.

From an outboard manufacturers perspective the introduction of new EVAP standards means that changes of specification need to be made to every outboard in the model line-up. Changes to fuel lines, gaskets and parts related to fuel movement throughout the engine are required. This is a development beyond the capability of all manufacturers, over such a short time scale as different countries have different production lines and mix of models.

Manufacturers Production Capacity

Since the Global Financial crisis of 2008 and 2009 most marine engine manufacturers have been forced to drastically reduce their production capacity.

Factories have closed and outside parts suppliers have rationalized their output ability. Manufacturers are now operating with very little flexibility; they are unable to change their production planning without considerable lead times.

Current sales forecasts by model are based on a 3 year cycle. Only minimal changes to the model mix can be achieved in the short time prescribed in the RIS.

Based on the likely schedule of introduction of legislation (mid 2011), any change to Yamaha's model line-up would not be possible by the proposed 2012 start time. Without a phase in period there would be gaps in the model line up that would result in financial hardship for Yamaha dealers and boat builders.

Phased vs Non Phased Introduction of Commonwealth Regulation

Page 38 (table 7.9) of the RIS shows that the difference in Net Present Value through application of either a Phased or non Phased approach to Commonwealth Regulation is slight.

Given that these calculations are based on the data that overstates both sales volumes forecasts and 2-stroke volumes against "clean engines" at time of legislation introduction, it would be sensible to introduce a phased in approach that minimizes the impact on consumers and marine businesses.

CONCLUSION

Yamaha Motor Australia restates its commitment to achieving uniformity with international standards of emissions for Outboard Motors and PWC's in order to reduce the impact of air pollution ion Australia.

In doing so YMA also has a responsibility to reduce the financial, social and personal impact on its business partners and customers.

We believe this can be achieved through on ordered phase in of the new standards as outlined in this response to the RIS.

Please feel free to contact the spokesman for YMA indicated below for further clarification or information.

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