HOUSE OF REPRESENTATIVES

STANDING COMMITTEE ON ENVIRONMENT, RECREATION and the ARTS

INQUIRY INTO THE REGULATORY ARRANGEMENTS FOR TRADING IN GREENHOUSE GAS EMISSIONS

SUBMISSION

BY

AUSTRALIAN MAGNESIUM CORPORATION Pty. Ltd.

OUTLINE OF SUBMISSION

SUMMARY

The Australian Magnesium Corporation Pty. Ltd. [AMC] is finalising proposals to construct the world's largest magnesium metal producing plant in Central Queensland. The project which will use the locally developed AM process will have an initial productive capacity of 90 000 tonnes per year of magnesium metal. The plant is being designed so that its output can be increased by at least a factor of four.

The project which has an estimated capital cost of A$800 million is expected to receive financial commitment by mid 1999 enabling to commence production in late 2002. The bulk of the output from the plant will be exported mainly for use to produce diecastings for motor vehicles.

The manufacture of magnesium metal is an energy intensive process and as such contributes to the emissions of greenhouse gases through the process itself and also in the supply of electrical power and other forms of energy to the metal plant It is estimated that a 90 000 tonne per year magnesium metal plant using the AM process will result in an overall increase in CO_2 equivalent emissions of 2 573 000 tonnes per year. This is without the use of sulphur hexafluoride.

Sulphur hexafluoride [SF_6] is in world wide use in the magnesium metal industry as an important component of the cover gas to protect molten magnesium from oxidation in foundry operations. Unfortunately SF_6 has a high global warming potential. It is one of the six gases mandated for reduction in the Kyoto Protocol. AMC is undertaking a major research effort to eliminate the use of SF_6 in the commercial magnesium metal plant. It believes that this is achievable. This will result in AMC's commercial plant operating with CO_2 equivalent emission levels at 17.3 percent below those of an similarly sized and configured project using the current world benchmark consumption of SF_6 of 0.5 kg per tonne of magnesium produced. On going R & D support from Government in developing alternatives to the use of SF_6 is necessary to achieve the early elimination of the use of this gas in the magnesium metal industry, both in metal production and in foundries manufacturing magnesium components.

The use of magnesium diecastings in motor vehicles to replace primarily iron and steel components is increasing as a cost effective weight reduction measure to reduce vehicle fuel consumption and consequently air emissions.

Life cycle analysis of magnesium and its use in motor vehicles as a replacement for steel has shown that the amount of CO_2 saved over the life of the vehicle due to lower emission levels exceeds that released in producing the primary magnesium metal. As the percentage of magnesium that is recycled, the net savings in CO_2 emissions increases. For the proposed 90 000 tonne per year magnesium metal plant this amounts to a net global saving of at least 1 925 000 tonnes per annum of CO_2 where 50 percent of the magnesium in automotive components are recycled.

The bulk of the diecast components produced from Australian magnesium will be used in automobiles manufactured, sold and operated in North America and Europe. As such, the savings in CO_2 emissions as a result of the use of magnesium as a steel replacement will occur in these countries whereas the emissions evolved in the manufacture of the magnesium will occur in Australia.

While the magnesium metal project will provide an overall net global benefit, it is imperative that any proposals developed for national and international trading in greenhouse gas emissions are comprehensive, efficient, equitable, implementable and transparent. This will

be necessary if the considerable economic and commercial benefits of establishing a magnesium metal project in Australia are to be realised and not penalised for delivering substantial greenhouse gas reductions in North America and Europe.

AMC believes in this context that Australia will be best served by product users and not producers having the responsibility for greenhouse gas emissions for they can more readily demonstrate in the country of use the credits for the energy savings they achieve.

AMC strongly recommends that the Australian Government actively be involved in all international discussions and negotiations concerning the development of a comprehensive, efficient, equitable and practical trading regime for greenhouse gases to protect Australia's national and commercial interests. In participating in these negotiations AMC requests that the Government take a strong proactive stance to influence the outcomes of any agreements on greenhouse gas emission trading to meet national objectives and needs. As the concept of international emissions trading is still poorly developed and without genuine and meaningful participation by the EU and the involvement of the developing countries, AMC remains sceptical that a workable arrangement can be developed which does not penalise both the national and our interests.

INTRODUCTION

Australian Magnesium Corporation Pty. Ltd. [AMC], has been established to complete the development and then commercialise the Australian Magnesium [AM] process technology for the processing of magnesite for the production of magnesium metal and magnesium based alloys.

AMC has constructed and is in the process of commissioning a magnesium metal demonstration plant at Yarwun near Gladstone in Central Queensland and is undertaking a detailed bankable feasibility study of a commercial magnesium metal plant with a design capacity of 90 000 tonnes per year. The commercial plant which would be located in Central Queensland is estimated to involve an investment of A$800 million. It would be the worlds largest magnesium metal production facility. Magnesite from the Kunwarara deposit 55 km north west of Rockhampton will be used as the feedstock for both the demonstration and commercial phases of the project.

Magnesium metal is the lightest of the structural metals in common use. Western world demand for magnesium metal is currently 335 000 tonnes per year. The market for magnesium metal is growing strongly and is expected to exceed 500 000 tonnes per annum by the early part of the next century.

The major area of growth in the demand for magnesium metal is in its use as a magnesium alloy [containing 90% plus magnesium] in the manufacture of light weight components for automotive use. The manufacture of light weight components, especially as diecastings has been growing at 18% per year over recent years.

The demand for an increased level of use of magnesium metal based components in motor vehicles has been triggered by the need to reduce vehicle weights as a means of reducing average vehicle fuel consumption and hence vehicle emissions.

The use of magnesium in motor vehicles over the life of the vehicles offers potential net global energy savings and a related global reduction in carbon dioxide [CO_2] emissions. Life cycle analysis of magnesium metal shows that while primary magnesium metal production requires a relatively large energy input, especially compared to steel, its use in motor vehicles to replace iron/steel based components over the life of the vehicle results in a net global energy saving. As the level of recycling of magnesium is increased, the overall energy needed to produce magnesium metal based components is reduced further. As a consequence the global net energy savings will be increased and there will be a commensurate net global saving in greenhouse gas emissions.

A commercial magnesium metal plant would add substantial net economic benefits to Australia through increased employment opportunities, the generation of income, broadening of the tax base and a significant increase in the value of net exports.

The availability of magnesium metal and magnesium alloys in commercial quantities, particularly hot metal from a local plant is expected in the short term to result in additional investment in foundry operations to produce magnesium based automotive components primarily for the export market.

This submission outlines AMC's proposed magnesium metal project, the Company's strategies to minimise its own greenhouse gas emissions, the economic benefits of the project to Australia, the net global savings that the use of magnesium in motor vehicles gives in greenhouse gas emissions and the need for an implementable and equitable regime of global trading in greenhouse gas emissions so that Australia and AMC can achieve the commercial and economic benefits from the project while effecting a net global reduction in greenhouse gas emissions.

AUSTRALIAN MAGNESIUM CORPORATION Pty. Ltd.

Australian Magnesium Corporation Pty. Ltd. [ACN 058 918 175] is an Australian company based in Brisbane. AMC is 95% owned by Australian Magnesium Investments Pty. Ltd. [AMI] which in turn is jointly owned by Queensland Metals Corporation Limited [QMC] and Normandy Mining Limited [Normandy]. Both QMC and Normandy are publicly listed companies on the Australian Stock Exchange. The remaining 5% of AMC is owned by Fluor Daniel Pty. Ltd., the wholly owned Australian subsidiary of the Fluor Corporation, a large US based engineering and construction management group.

The structure of AMC is outlined in Figure 1.

A world significant deposit of magnesite, a naturally occurring magnesium carbonate was discovered in 1985 by QMC in the Kunwarara area 55 km north west of Rockhampton, Central Queensland. The deposit is located in flat, cleared cattle grazing country adjacent to the Bruce Highway and Queensland Rail's main north south railway system.

Figure 2 shows the location of the Kunwarara magnesite deposit in Central Queensland.

The Kunwarara deposit occupies a sinuous 30 km long shallow depression developed over granitic basement rocks. It covers an area of 63 km^2. The deposit which does not outcrop is overlain by humus rich black clays varying from 0.4 to 12 metres and averaging 4.0 metres in thickness.

The ore body is a laterally continuous, flat lying magnesite rich zone varying in thickness between 1.0 and 26 metres and averaging 10.9 metres. The magnesite occurs in nodules within the ore zone matrix. The Kunwarara magnesite is classified as having a measured resource of 1.2 million tonnes in-situ. The magnesite is a low iron, nodular, cryptocrystalline type. The Kunwarara magnesite deposit is of world significance in terms of size and grade.

Mining operations commenced at Kunwarara in 1991 to supply magnesite feedstock for refractories manufacture by Queensland Magnesia Operations Pty. Ltd. [QMAG] at Rockhampton. QMAG is a wholly owned subsidiary of QMC. Approximately 3 million tonnes per year of ore is currently mined and beneficiated to produce 300 000 tonnes per annum of magnesite at 95% grade.

AMC has freehold title to an area within the Kunwarara deposit known as Oldman South. This contains an estimated 120 million tonnes of in-situ resource.

Figure 3 illustrates mining activities at Kunwarara.

THE COMMERCIAL MAGNESIUM METAL PLANT

In an endeavour to capture part of the growing market for magnesium metal, QMC in 1986 initiated work in to investigate the development of a process to produce high purity magnesium metal from Kunwarara magnesite at internationally competitive costs. Much of this early investigative work was undertaken for QMC by the CSIRO.

In 1992, QMC and the CSIRO established a 5 year, $50 million, collaborative joint venture R & D program known as the Australian Magnesium Research and Development Program [AMRDP] to develop a low cost technology to produce high purity magnesium metal from magnesite. QMC arranged a $25 million contribution to AMRDP while the CSIRO's $25 million comprised a $20 million package from the Commonwealth Government and $5 million from the Queensland Government.

As a result of the work undertaken by AMRDP, the AM process was developed. It has been tested at a mini pilot plant scale on a continuous basis. The results of the pilot plant stage indicated that a commercial magnesium metal plant using the AM process has the potential to produce magnesium metal at a cost lower than most of the world's existing magnesium metal plants.

The AM process technology is covered by a number of patents which have been filed in various countries.

In January 1997, AMC acquired all of QMC's interests in the intellectual property, the technology, licences etc. for the AM process and all related intellectual property associated with magnesium metal. QMC used the proceeds from this sale to fund its holding in AMI.

On 16 January 1997, AMC announced that it was proceeding with the pre-commercial phase of the project. This $73 million program comprises the construction of a magnesium metal demonstration plant at Yarwun near Gladstone to confirm the AM process technology on a commercial scale. It also involves the undertaking of a bankable feasibility study for a 90 000 tonne per year commercial magnesium metal plant to be constructed at an estimated capital cost of $800 million.

The Ford Motor Company , the world's largest consumer of magnesium alloys for automotive diecasting has made a contribution of US$30 million to the pre-commercial phase. Ford will not be participating in the equity of the project but it has entered into a long term off-take agreement to purchase 45 000 tonnes per year of magnesium alloy for 10 years.

Construction of the demonstration plant is nearing completion. Pre-commissioning has commenced. The demonstration plant is expected to be operational by the end of June 1998. Figure 4 is a view of the demonstration plant at Yarwun.

The operation of the demonstration plant and the outcome from the bankable feasibility study is expected to result in a decision in mid 1999 to proceed with the construction of the proposed 90 000 tonne per year commercial magnesium metal plant in Central Queensland. The schedule calls for the project to commence production in late 2002 and reach full production in early 2004. Figure 5 illustrates the important milestones for the project development.

The commercial plant is being designed so that it can be expanded to meet future growth in the magnesium metal market. The planning for the expansion of the project is based on it being capable of being expanded by a factor of four with an ultimate capacity of approximately 360 000 tonnes per year.

PROCESS TECHNOLOGY

The magnesite for the commercial plant will be mined at Kunwarara by excavator and truck operations. The ore will then be beneficiated to produce 400 000 tonnes per year of clean magnesite feedstock containing approximately 90% magnesite. The remaining gangue materials consist of lime, clays sand and small quantities of iron, manganese and trace nickel oxides. Road, rail and slurry pipeline transport modes are being investigated as means of transporting the beneficiated magnesite to the magnesium metal plant site.

In the AM process the magnesite is dissolved in hydrochloric acid to produce a magnesium chloride solution. The leach solution is purified and a small quantity of waste containing the lime, clays, silica and metallic oxide components in the ore are removed and neutralised to give a stable solid suitable for clean land fill. The purified magnesium chloride is dehydrated in a process developed specifically for this project. The chemicals used in this process are recovered and recycled.

The dried or anhydrous magnesium chloride is fed to an electrolytic cell where the molten magnesium chloride is dissociated to magnesium metal and chlorine gas. The chlorine gas is recycled and used in the manufacture of the hydrochloric acid utilised in the initial leach stage. Hydrogen which is also required in hydrochloric acid manufacture will be produced on site from natural gas.

The molten magnesium produced by the electrolysis process is tapped from the cell and transferred to a holding furnace. The bulk of the magnesium will be used on site to produce commercial magnesium alloys. The pure magnesium and the magnesium alloys will be cast into ingots for sale.

The magnesium metal plant will also incorporate a range of utility functions including waste heat recovery, natural gas fired heaters, cooling water systems, emission control and waste water treatment facilities.

The commercial magnesium metal plant will operate on a continuous 24 hour, 365 day per year basis.

A schematic outline of the AM process is given in Figure 6.

The production of magnesium metal, like aluminium, is energy intensive. Large quantities of process heat in the form of steam are required in the production of anhydrous magnesium chloride. This can be produced on site or purchased from an independent utility supplier Natural gas is required for direct heating and for the manufacture of hydrogen. Magnesium electrolytic cells like aluminium reduction cells use approximately 13 000 kWh of electrical energy per tonne metal produced.

For the 90 000 tonne per year commercial magnesium metal plant, the energy requirements will be:

- Electricity 168 MW
- Steam 5.7 PJ/a
- Natural Gas 3.7 PJ/a

Discussions are now at an advanced stage with potential power and steam suppliers in Central Queensland for the supply of internationally priced electricity and steam. At this stage it appears that the most competitive supplier will be one of the three major coal fired base load power stations in Central Queensland. These are the 700 MW Callide unit near Biloela which is operated by CS Energy Limited and shortly which will be expanded by a further 840 MW , Gladstone Power Station operated by NRG Limited which has a capacity of 1 650 MW and the 1 400 MW Stanwell plant near Rockhampton of the Stanwell Corporation Limited. The operation of these power stations in a co-generational mode by supplying both electricity and steam results in an appreciable reduction in greenhouse gases compared with their supply from independent sources.

Natural gas is expected to be supplied from the existing natural gas pipeline infrastructure already in place in Central Queensland.

ECONOMIC BENEFITS OF THE PROJECT

A 90 000 tonne per year magnesium metal plant in central Queensland will result in a range of economic benefits to Australia through the level of investment, increased employment opportunities, increased level of exports as well as increased demand for goods, consumables and services within the region [Fitzroy Statistical Division], and beyond [Queensland and rest of Australia].

The direct economic impacts for the commercial magnesium metal plant are:

- Investment — A$800 million
- Employment
  - AMC direct — 300
  - Contractors — 100
  - Total — 400
- Wages Paid [Income] per year — $23.6 million
- Taxes paid per annum
  - Payroll — $1.5 million
  - PAYE — $7.9 million
- Annual value of output — $450 million
- Annual value of export income — $410 million
- Annual expenditure on consumables and services — $180 million

Preliminary economic modelling based on previous work undertaken in Central Queensland with other projects and applying the economic multipliers derived for these cases have been used to provide an estimate of the additional employment, income, taxes paid, output etc. generated as the result of the establishment and operation of the project. The overall economic impacts of the commercial magnesium metal plant are estimated as follows:

Commercial Magnesium Metal Plant
Overall Economic Impacts

	AMC Direct (1)	**Fitzroy Region**	**Rest of Queensland**	**TOTAL**
Employment	400	340	360	1 100
Income [$M/a]	23.6	15.3	16.2	55.1
Taxes [$M/a]				
Payroll	1.5	1.0	1.1	3.6
PAYE	7.9	5.1	5.4	18.4
Value of output [$M/a]	450	160	110	720
Value of export [$M/a]	410	-	-	410

Note (1) includes contractors/out sourced employees.

Detailed input- output modelling to provide a more specific estimate of the economic flow-ons of a 90 000 tonne per year magnesium metal plant are being undertaken as part of the Impact Assessment Process for the project.

The availability of magnesium metal in Central Queensland is likely to attract /facilitate investment in a world scale diecasting plant in the region. A diecasting facility could also be expected to attract investment in related tool and diemaking facilities and relevant support industries. The direct economic impacts of diecasting and related facilities are:

DIRECT ECONOMIC IMPACT

DIECASTING and RELATED FACILITIES

	Diecasting	Tool/Diemaking and Support Firms
Investment [$M]	100	50
Employment	200	100
Income [$M/a]	10	5
Taxes paid [$M/a}		
Payroll	0.7	0.3
PAYE	3.3	1.7
Value of output [$M/a]	270	50
Value of exports [$M/a]	215	-

If the magnesium metal plant is expanded over time from a plant with a capacity of 90 000 tonnes per year [Stage 1] through to a final capacity of 360 000 tonnes per year [Stage 4], the economic impacts on the Queensland and Australian economies will be significant. Figure 7 shows the number of full time jobs likely to be created as additional stages are added to the initial Stage 1 project.

GREENHOUSE GAS EMISSIONS from the PROJECT

A 90 000 tonne per annum magnesium metal plant using the AM process will emit to the atmosphere approximately 638 000 tonnes per year of carbon dioxide [CO_2] or 7.1 kg CO_2/kg Mg. In addition to the metal plant itself CO_2 will be generated as a result of mining operations at Kunwarara and in the transport of the magnesite to the magnesium metal plant. The quantity of CO_2 discharged in mining and transportation is estimated at 135 000 tonnes per year or 1.5 kg CO_2 /kg Mg.

The major energy sources for the project including electricity [168 MW] and steam [5.7 PJ/a] will be supplied from an existing coal fired power station in Central Queensland. The estimated CO_2 emissions from the combustion of low sulphur Bowen Basin coals in these power stations to meet the energy needs of the magnesium metal plant is 1 800 000 tonnes per year or 20kg CO_2/ kg Mg.

Sulphur hexafluoride [SF_6] is widely used in the magnesium industry in gas mixtures to protect molten magnesium from oxidation. It is an important component of the cover gas used in the casting of magnesium and its alloys in the foundries within magnesium metal plants. SF_6 is a colourless, odourless, non-flammable, non-toxic and heavier than air gas which is thermally stable to 800^0C and does not react with water. For these reasons it has largely replaced alternatives such as sulphur dioxide which poses operational and health risks.

Unfortunately SF_6 has a high global warming potential. Because of its chemical stability SF_6 is a long life greenhouse gas with a global warming potential [GWP] of 23 900 relative to CO_2. It is one of the six gases mandated for reduction in the Kyoto Protocol [Annex A]. Modern practice in magnesium metal plants has resulted in the reduction of SF_6 usage to 0.5 kg per tonne of metal produced. Because of the high GWP of SF_6, its use at this rate gives a global warming effect equivalent to 12 kg CO_2/ kg Mg.

AMC is undertaking a major research effort to eliminate the use of SF_6 in the commercial magnesium metal plant as any reduction in the use and or release of SF_6 will result in a major reduction on greenhouse gas emissions from the proposed magnesium metal project. Research work to date by AMC has indicated that a commercial magnesium metal plant has the potential to be operated without the use of SF_6. AMC's pilot foundry operations have confirmed that SF_6 consumption can be reduced to 0.25 kg per tonne of magnesium metal produced. This is half the level currently accepted as best practice in magnesium foundry operations.

While AMC is continuing with its efforts to completely eliminate the use of SF_6 in the commercial production of magnesium metal, on going R & D support from Government for this activity is necessary for achieving the early elimination of the use of this cover gas in the magnesium metal industry, both in metal production and in foundries producing magnesium based components. The benefits of the research into eliminating SF_6 in handling molten magnesium metal will apply to the whole magnesium metal industry and not just AMC.

The overall greenhouse gas emissions expressed as CO_2 equivalents from AMC's proposed project are:

Activity	**CO_2 Emissions t/a**	**kg CO_2/kg Mg.[1]**
Mining and Transport	135 000	1.5
Magnesite Leaching	173 000	1.9
Hydrogen Production	210 000	2.3
Direct Heating	210 000	2.3
Foundry	45 000	0.5
Sub Total	773 000	8.6
Coal Fired Power Station [2]	1 800 000	20.0
Total	2 573 000	28.6

Note 1. CO_2 and CO_2 equivalent.

Note 2: CO_2 emissions from coal fired power station relate solely to those attributable in supplying the electrical and steam energy needs of the magnesium metal plant.

MAGNESIUM LIFE CYCLE ANALYSIS

Life cycle analysis/assessment [LCA] is a method for evaluating the environmental impact of a product throughout its whole life cycle.

While the production of magnesium metal is energy intensive and from the above figures contributes some 28.6 kg CO_2 per kg magnesium produced [or 34.6 kg CO_2/ kg Mg. if SF_6 cannot be eliminated], the magnesium produced will principally be used to produce diecastings for use in motor vehicles. It is the environmental performance of these components over the life of the automobile and its subsequent disposal and or recycling that is important in a life cycle context.

Magnesium components are being increasingly used by the automotive industry where weight reduction is a cost effective means to further reduce vehicle fuel consumption and consequently air emissions. The Corporate Air Fuel Emission [CAFÉ] Standards set by the US Government are ensuring that magnesium and other light metals such as aluminium and light weight materials like composites will continue to be used at the expense of heavier materials such as iron and steel.

Another factor is that for most vehicles the annual consumption of energy to operate the vehicle is of the same order as the energy needed to produce the materials and to assemble the vehicle. As a result any reduction in the weight of a vehicle has a large impact on the life cycle energy consumption of a vehicle.

Considerable work has been undertaken by the automobile industry on life cycle analysis of light materials as a replacement for iron and steel. More specific life cycle analysis on the use of magnesium as a replacement for iron and steel and aluminium in vehicles has been undertaken by Hydro Magnesium, a wholly owned subsidiary of Norsk Hydro ASA. of Norway. Hydro Magnesium is the world's largest magnesium metal producer with plants in Norway and Canada.

The basic conclusions from the Hydro Magnesium studies [References 1 &2] are that where magnesium components replace those of steel there is an average saving over the life of a passenger motor vehicle where 50 percent of the magnesium is recycled of 50 kg CO_2 per kg of magnesium used.

For the AMC project approximately 28.6 kg CO_2 equivalent is generated per kg magnesium metal produced. This results in a net global saving of 21 kg CO_2 per kg magnesium where it is used to replace steel. In terms of AMC's proposed 90 000 tonne per year commercial plant, this amounts to a net global saving of CO_2 of 1 925 000 tonnes per annum. If the usage of SF_6 as a cover gas cannot be eliminated, the net global saving of CO_2 equivalent from the magnesium metal project will fall to 1 350 000 tonnes per annum based on a net use of 0.25 kg SF_6 per tonne magnesium metal.

It is expected that over 90% of the magnesium diecast components used in motor vehicles will end up in vehicles manufactured, sold and operated in North America and Europe. As such the savings in CO_2 emissions as a result of the use of magnesium to replace steel will accrue in these countries whereas the CO_2 emissions involved in the manufacture of the magnesium occur in Australia. The development of a practical, efficient, equitable and transparent regime for national and international trading in greenhouse gas emissions is necessary if the considerable economic benefits of establishing a magnesium metal project in Australia are to be realised and not penalised on the basis of the local greenhouse emissions while delivering substantially greater greenhouse gas emission reductions in North America and Europe.

AMC STRATEGIES TO MINIMISE GREENHOUSE GAS EMISSIONS

Reduction in Production of CO_2

The operation of the demonstration plant at Yarwun will be used to optimise the AM process. A major component of the optimisation process will be to minimise the overall energy inputs as well as maximising heat recovery within the plant. The results of these trials are expected to effect further energy savings with the result that there will be a commensurate reduction in the amount of CO_2 generated.

Once the commercial plant is operational, AMC will continue with its development work to achieve continual improvement in the energy efficiency of the AM process.

Sulphur Hexafluoride

As referred to previously, AMC is undertaking considerable research work to establish ways to eliminate the net use of SF_6 in the foundry operations in the magnesium metal plant. Because of the high global warming potential of SF_6 any reduction in the loss of this cover gas to the atmosphere will result in large reductions in emissions of CO_2 equivalents.

The results of the research to date has resulted in AMC being confident that it can develop a means of operating its proposed plant without the use of SF_6. AMC has confirmed that it can operate its projected commercial plant with an SF_6 consumption of half the current industry best practice.

Alternative Uses of CO_2

AMC is continuing to pursue alternative uses for some of the CO_2 it produces. High grade CO_2 is produced from the magnesite leaching operation and in the production of hydrogen. Markets for this gas are being pursued but the prospects of disposing of any significant quantities of the CO_2 produced are considered negligible.

Carbon Dioxide Sinks

AMC is continuing to analyse the practicality of utilising CO_2 sinks to effect a net reduction of greenhouse gas emissions from the project. This work is continuing but the use of sinks does not appear to be an economic proposition.

AMC's RESPONSE to the INQUIRY's TERMS of REFERENCE

AMC endorses the basic outcomes of the Kyoto Protocol with its expectation that measures such as international emission trading and acceptance of sinks can be developed in a comprehensive way to assist all participants meet their commitments. However in achieving this outcome it has to be efficient in being able to deliver environmental benefits in a cost effective way, be equitable both nationally and internationally, be transparent while being flexible, practical and implementable. These principles have to be applied such that they do not inhibit or penalise Australia's cost competitiveness and its potential for continuing economic growth to meet both national economic, social and community needs and corporate growth.

The development of an international emissions permit trading regime will take considerable time and effort to finalise. However in order to meet the above enunciated fundamental principles it is necessary in the light of the current lack of development of the emissions trading concept, the EU scepticism about international trading in emissions and use of sinks and the non-participation of non-annex 1 countries in the Protocol that the Australian Government actively participate in the negotiations and influence the outcomes in these matters to ensure that they are truly comprehensive and that they provide the certainty to meet both national and corporate interests.

In its international negotiations the Australian government must have cognizance of the role and needs of industry in any international emission trading regime and the issue of permits under such a regime. It must provide a framework of certainty under which future investments can be made. A key issue in providing this certainty is that the permits regime is comprehensive, efficient and equitable in that it takes into account all economic sectors. It also has to address the matter of permits as property rights including their allocation, trading and treatment for taxation purposes. AMC opposes any notion that permits should be used as a revenue device or as a basis to levy some form of a carbon tax.

AMC is concerned that unless a fully comprehensive arrangement is developed and can be internationally implemented, it may be liable for penalties if full credits are not provided for the metal in use which confers environmental benefits to non Australians. This could put at risk the development of a whole new industry based on value adding to magnesite through the production of magnesium metal and magnesium alloys to the large scale manufacture of automotive components for the world car industry. AMC believes that Australia will be best served by product users and not producers having the responsibility for greenhouse gas emissions for they can more readily demonstrate in the country of use the credits for the energy savings they achieve.

In developing a tradeable permit regime, it is necessary that it has an efficient, equitable and transparent monitoring and audit scheme. The monitoring and verification process should be structured to minimise compliance costs, encourage innovative means of monitoring emissions and facilitating self-assessment with appropriate audit.

AMC fully supports the submission to this inquiry by the Australian Industry Greenhouse Network.

CONCLUSIONS

The projected construction and operation, and possible future expansion, of a commercial magnesium metal plant in Central Queensland by the Australian Magnesium Corporation Pty. Ltd. will provide Australia with considerable economic benefits by way of investment, employment, income, broadening of the tax base and significant export income as well as being a flagship for Australian technology.

The life cycle analysis of magnesium for its uses in Automotive diecastings shows that the AMC project will provide on a global basis a net benefit in terms of greenhouse gas emissions. However for Australia and AMC to achieve the economic and commercial benefits without incurring greenhouse gas emission penalties while delivering net global greenhouse gas emission reductions requires a comprehensive, effective, efficient, equitable and implementable international tradeable regime to be developed as a consequence of the Kyoto Protocol..

The development of an appropriate international trading regime for greenhouse gases will be critical to Australia and AMC becoming a major player in the world magnesium metal industry while delivering the benefits of net global reductions in greenhouse gas emissions.

RECOMMENDATIONS

AMC makes the following recommendations to the Committee:

- That it recognises the efforts of Australian Magnesium Corporation Pty. Ltd. to develop an internationally competitive, world scale magnesium metal industry in Central Queensland based on an innovative indigenous technology.
- That it notes the national economic and global environmental benefits the proposed commercial magnesium project of Australian Magnesium Corporation Pty. Ltd. will deliver.
- Notes AMC's concerns that unless a comprehensive and implementable international trading regime for greenhouse gases is developed, AMC and Australia will be unable to achieve the full commercial, economic and environmental benefits of developing a world scale magnesium based industry.
- Notes the efforts that AMC is taking to minimise its emissions of greenhouse gases

- Notes AMC's support for the submission to the Committee by the Australian Industry Greenhouse Network.
- It endorses the need that the Australian Government continue to actively participate in the negotiations and influence the outcomes relating to tradeable permits in greenhouse gas emissions to protect Australia's national and commercial interests.
- That it encourages the continued Government support of funding directed to the improvement of the AM process and the optimisation of low GWP cover gases or the like in magnesium metal or alloy casting operations.

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