

Corporate Social Responsibility  
Association *of* Australia



# Survey Guide

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The CSRAA rating evaluates a corporate and its operation from an ethical perspective. The awarded survey score, between 1 and 5 stars complement the traditional benefits of a corporate's product or service. It adds ethical validation to the marketing mix and the corporate identity.

The rating is derived from the sum of the weighted answers given to the survey questions. The rating provides operational moral endorsement. All significant areas are assessed.

This guide enables better answers when completing the survey. A high rating indicates consumers can trust and feel good about purchasing your product or service. The guide is designed to assist you acquire the best score you are able. A feedback report shows how you might improve in the future.

The survey can start influencing and rewarding better behaviour immediately. News shifts attitudes. Significance, justifies the inclusion of information within the news section of the CSRAA website. A change to a particularly poignant and influencing area or a new point, updates the survey as well. Contemporary ideas and issues direct editorial policy. Coverage remains a work in progress.

Improving your ratings and keeping this guide updated is an ongoing challenge. The CSRAA offers a relationship and mechanism that recognises performance and provides feedback and suggests improvements. The areas examined reveal and identify your current business ideology. The process also considers the impact of your future plans. The marking criteria applies the "SMART" assessment technique.

Each question has a weighting that reflects the importance attributed to the area. The CSRAA assigns a value for each distinct issue governed by its importance. The allocation ensures adequate merit is attributed to each area so the weighting system produces an accurate representation of the part in the final overall rating score.

The rating awarded is based on a process of disclosure and transparency. An independent CSRAA audited rating can be ordered although in most cases the 'applicant completed' survey provides sufficient ethical validation, disclosure and marketing opportunity.

Topics of significance have additional considerations. Detailing issues affecting these sectors and key factors are described in this guide. Their mention aims to ensure relevant information is provided to enable better informed answers. During the survey, additional information can be acquired by clicking the 'question mark with a hint' icon. Quantified ethical values can now feature in your marketing. The rating enables the majority of individuals who will not support or use products or services without prior knowledge of ethos and identity to become clients. Insight enables a purchasing decision.



In today's society, most individuals will not work for a corporate without disclosure. The rating placates these workers and an awarded rating is a way to communicate ethical stances to both customers and staff. Moral values and integrity are as important as the quality of your product and service.

The catalyst for equality might have been the internet, Mr. Floyd's death, or global warming. Regardless of the reasoning and the timing of the markets moral evolution, an increased awareness amongst consumers and staff exists. The ratings offer transparency and moral validation. The CSR rating provides individuals the insight they desire.

Mr. Vince Cerf, one of the founders of internet, aptly remarked of the value of transparency stating "the ability to decipher quality information from disinformation is vital." (BBC News, Vince Cerf, 2020).



The CSRAA offer no warranty governing the suitability or accuracy of the rating to your business. Attitude and policy is progressive. Random checks help ensure accuracy and the process is part of standard procedure.

# Markets Moral Evolution

## SECTION 1: General Corporate Information

Business name and details of key individuals. Type of entity. Sector and location of operation(s).

## SECTION 2: Employment And Working Conditions

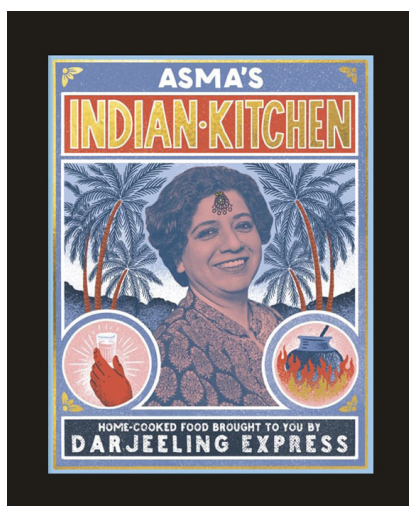
The corporate's employment policy and its working conditions reveal the value placed on its staff. The percentage of indigenous representation and the balance of gender and race also reflects this.

The survey examines aspects that effect the welfare of the staff, their satisfaction and the type of work experience employees encounter. It determines whether workers have satisfaction and pride in their association and evaluates whether the staff is considered a progressive asset.

The high level of government bureaucracy and enforcement within this area reflects the societal importance as well as the value to the individual. The CSRAA assesses any gap between reality and the corporate image. It measures whether ethical standards are adhered to with respect to all issues. Fairness and assisting in the development of the individual is rewarded.

Asma Khan and her success is testimony to individual strength and represents great motivation. Such talent may be rare but opportunity given reflects well within the ratings. A corporate who appreciates the benefits of encouraging personnel development regardless of convention in order that both the employee and the employer benefit, as a result of the individual's personnel growth, is well regarded.

The CSRAA wishes to encourage and reward corporates that value personnel development. Asma is a lady who successfully opened an Indian restaurant by overcoming typical stereotypes. Encouragement and success of an individual due to their talent rather than their race and or gender represents true equality.



From Indian descent, she put a marker down for her gender, so magnificently, that her colour was not even a consideration. Today, Khan is a successful restaurateur who dreams of opening a tea room for the children of Calcutta based prostitutes. She has already successfully set up a restaurant, a safety zone, within a refugee camp. Inspiration personified.

Hopefully her story will make you assess whether you are providing and encouraging sufficient personnel growth and opportunity to your staff. After all, we spend a lot of time within the working environment and all can benefit from an individual's growth and success.

### SECTION 3: Corporate Financials

Corporate financials and audited statements, approved by the Australian Taxation Office, enable an accurate financial evaluation to quantify the amount of CSR expenditure. A financial figure can be indicative of the size of the CSR and compliments other components. The figure is not always representative of the proportion of CSR financial commitment since CSR expenditure might not necessarily appear in every area. When a corporate does have higher expenditure and chooses an ethically good solution, despite cheaper alternatives, it reflects well.

### SECTION 4: Corruption Report

This area is of importance to the CSR calculation since corrupt behaviour reveals the true character of a Corporate. The CSRAA approves ethical actions and does not endorse corrupt and illegal operations. The honesty of an applicant and of its ownership can be assessed by the number of legal cases and their results.

### SECTION 5: Product Packaging Materials And Label Information

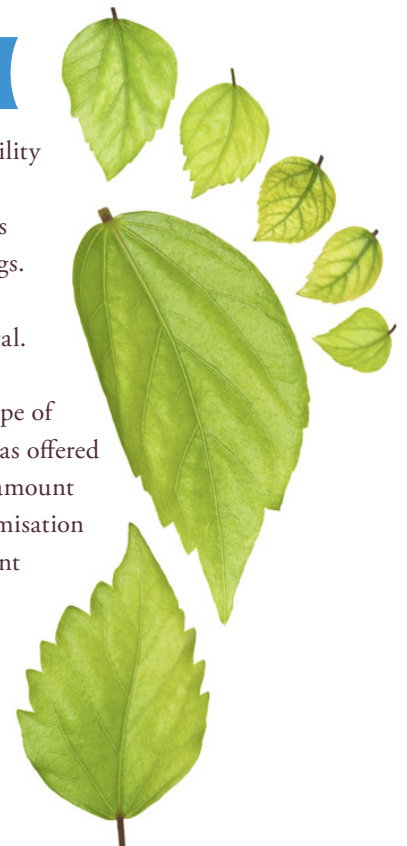
Examination of a products packaging reveals the materials used and the importance that the applicant attributes to zero environmental impact. The degradability of the packaging represents a significant part of the CSR calculation in this section.

### SECTION 6: Energy Policy

A Corporate has a bigger energy footprint than an individual. With size, comes a responsibility to minimise negative impacts. This is especially true of energy decisions. There is always a balance between cost, profit, impact and viability. The size of the negative impacts increases the responsibility to make the right choice. The Energy sector is a key area within the ratings. Reduced impacts due to higher costs reflect well; contributing to a higher CSR rating. A common indicator is the size of the applicant's carbon footprint. Emissions are detrimental.

Analysis reveals the amount of power, the source and type supplied to the applicant. The type of the power provider reflects the attitude and effort made in acquiring a low impact solution as offered by wind, hydro and solar power manufacturers, the renewables. The selected provider, the amount of power consumed and the efficiency of an infrastructure concerning use and power minimisation provides an indicative value. The actions and impacts of both the providers and the applicant have an effect upon the score awarded.

Globally, hybrid power providers only contribute 8% of the supply. By themselves they are unable to fulfill the energy demand. Therefore, nuclear energy and natural gas are recommended as part of an aggregate power solution with low impact. Their inclusion enables an immediate reduction in emissions and global temperature pressure.







The proposed aggregation satisfies 100% of the energy requirements. The selection of natural gas is validated because it is the cleanest and least high polluting alternative compared with other power sources that enable the grid to meet demand. The rationale for the inclusion of the nuclear industry is similar.

The nuclear industry does not add greatly to emissions, nor does it hinder the goal of the United Nations Paris treaty to reduce the global temperature by 2 degrees. Operationally, generally, it is not detrimental to global temperature

The nuclear industry's safety record does cause reservations as there have been 66 incidents, approximately 1 per year since 1940, with accidents ranging from the death of an individual to ongoing issues at Fukushima. There are also numerous negative impacts to consider from over 1000 atomic tests.

Perspective is vital to ensure threats are correctly assessed. Survival demands we focus on the right issues at the correct time rather than the loudest or apparent priorities. **The CSRAA is proud to offer a quantification of ethics to supplement traditional economic values.** Technological advancements affect solutions. One of the current high impact power providers may yet offer an environmentally friendly solution in the future. An entirely new alternative might be discovered or the currently available hybrid power sources will perform at a scaled up level to increase upon their current 8% contribution. A reduced reliance on foundational energies has been experienced but further emission reductions are still required. Oil consumption fell from 50% to 34%, over the last 30 years, coal still accounts for 29%. Gas, provides 23% and is climbing, nuclear represents 5%, and is increasing but renewables account for only 2% and hydro 6%, only 8% when combined, (Tinkler, 2019).

Power aggregation without coal or fracking oil would cause a reduction in global CO2 pressure. The CSRAA offers no support of the fracking process. The end of fractured oil usage and the resultant lower impact on the environment could be immediate were government support available. Sector restructuring similar to the German economy where coal is being phased out is required globally. Fracking and coal negative effects could be immediately removed. To meet power demands with no reliance on fracking oil or coal, "natural gas production has to double, nuclear energy must be increased by 300 reactors and the renewables growth needs to increase by 5 times," claims Scott Tinkler (Tinkler, 2019).

Lower power demand is unrealistic as 600 million consumers from India and China alone are entering the market. Other countries have growing power demands and should also be factored into the calculations. Despite the risks associated with the nuclear industry, our begrudging recommendation is based on emulating the



**Energy  
footprint is  
crucial**



French safety record and their history of low emissions. The rationale is simple; the earth can survive a nuclear accident, but it cannot survive unless we change. We need to stop damaging the ozone layer that giving earth a life sustaining atmosphere; we need to stop destroying the golden goose.

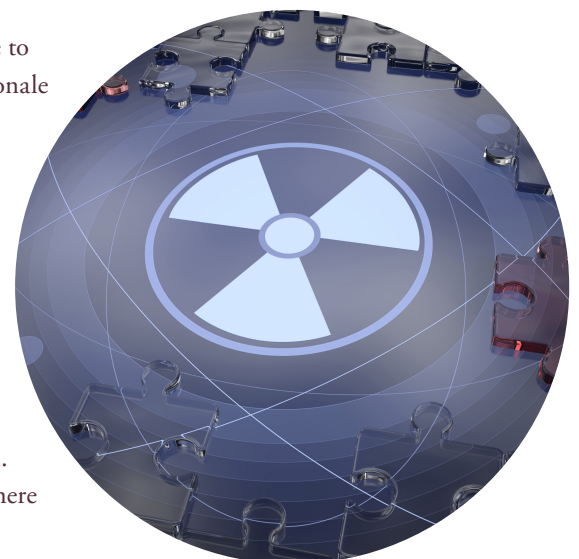
The French nuclear system has historically managed to control human error. Safe nuclear operation and any negative impacts are 'minimal' compared with the certainty of detrimental effects from; fracking and coal, especially significant, the resultant temperature pressure and damage to the ozone layer. The proposed aggregated power solution offers immediacy, action today. Increasing the output of non-polluting power sources and using lower risk options would be preferable but that option is not currently available. There remains an inability to meet the power demand with renewables alone.

Aggregation of power alternatives provides an instant solution. A failure to act might have irreversible consequences? Delay risks survival? Adjustments are required? Current power providers who find themselves out of favour because of negative impacts might improve upon performance by discovering and or implementing new technology and becoming viable due to a new offer with lower impacting side-effects. Quite an incentive. The demise of the German coal industry is based on their government's decision to be proactive, deciding not to wait for technologic advances or promises. They have targeted closure of all the coal burning plants that emit carbon whilst making electricity, by 2038. Currently, renewable energy represents 40 per cent of Germany's energy grid and there are plans to expand renewables contribution to 65% by 2030 so as to meet the Paris schedule.

The Global CCS Institute (GCIS) argues any coal industry closure is premature, claiming technology enabling the removal of 90% of the CO<sub>2</sub> emissions could be applied. (2017). The industry, has however been saying that for 30 years plus. One muses if that was the case; why has the filtration to reduce emissions not been applied? Carbon capture and storage is required now if Paris targets are to be met. The Australian government claims to easily be able to meet the Paris treaty deadlines. There is little support of any progress and numerous claims of inactivity by recognised scientists. The clock keeps ticking. Retrofitting filters or adding filtration to new designs will increase costs by approximately AUD \$2.5 billion per 500 MW boiler. (2014).

The GCIS agrees it is vital to decrease coals emissions, explaining the choice to reduce emissions but the low cost of coal would be affected. It uses this rationale to justify non-action. There is even mention of the removal of fly ash as an option and a confirmation of coal emitting nearly twice the level of CO<sub>2</sub> as natural gas, 370 g CO<sub>2</sub> / KWH versus 700 g CO<sub>2</sub> / KWH (A critical technology for saving our environment, 2018).

The industry is aware of the solution and has chosen not to offer it. Pollution has kept occurring in order to keep the price of coal power down. The GCIS claim the deployment of carbon capture and storage is vital to tackle climate change. The CO<sub>2</sub> capture occurs pre-combustion and or post-combustion. Oxyfuel is used during post-combustion operation. The bi-product is water vapour. The quantity of water vapour in the atmosphere can have dramatic negative impacts, detailed later. Classic #greenwashing?





The filter technology is expensive to apply and 10% of the CO<sub>2</sub> gas still escapes. Carbon capture has been demonstrated and validated within numerous industrial processes for many years. Application is related to cost. Gas manufactures can apply similar CO<sub>2</sub> reducing filters? (A critical technology for saving our environment, 2018).

A ban on emissions might speed up solutions and force improvement. The application of filters increases the cost of coal power and logic dictates they will increase gas prices too. Those governing cost might consider the cost of no action. A desire for lower emission solutions reflect the attitude of the majority of current demand in Australia. Demand for cheap power remains the primary incentive in overseas markets. What if global legislation prevented emissions and governments provided financial alternatives that supported low impact solutions?

A French Corporate, Iter, is currently undertaking tests in France that if successful offer a much improved nuclear solution, Iter claims, success is 5–10 years away and involves nuclear fusion rather than the current fission. (“Nuclear fusion: ‘A question of when, not if’”, 2019).

Iter is undertaking a “task of cosmic proportions,” a “political beacon of unity,” claims the French president, Emmanuel Macron. (EU marks assembly phase of world nuclear fusion project in France, 2020). Success will deliver pollution free power in 2025. The AUD \$40 - \$50 million will replicate reactions that power the sun and is intended to demonstrate fusion power can be generated on a commercial scale. Nuclear fusion would provide clean, unlimited power. Despite 60 years of research, the technical challenges of harnessing such extreme amounts of energy remain. There is much potential.

Millions of components and a giant reactor, weighing 23,000 tonnes represents the most complex engineering endeavour in history. Bernard Bigot, Iter’s director-general, said “clean energy will be a miracle for our planet,” (Carrington, 2020). Fusion and renewable energy, could improve the proposed aggregate low emission power solution.

In similarity with conventional nuclear fission reactors, the process does not produce climate-warming carbon dioxide and theoretically fusion reactors cannot meltdown. The process also produces much less radioactive waste.

Among the components being assembled is the central solenoid, which has the magnetic power to lift an aircraft carrier. Current nuclear energy relies on fission, where a heavy chemical element is split so as to produce lighter ones. Nuclear fusion, alternatively, works by combining two light elements to make a heavier one. Prof. Ian Chapman, chief executive of the United Kingdom Atomic Energy Authority states, “Fusion can change the world, providing clean energy to future generations. We know everything we need to succeed.” (Council, 2020).



## Aggregated Solution?

The main waste product from using fossil fuels in the production of electricity and the primary source of the global warming is CO<sub>2</sub>. Using CO<sub>2</sub> as a source of power has not yet been fully investigated. Harvesting CO<sub>2</sub> within the production process and using it as a power catalyst has the potential of removing it as a waste product and increasing the efficiency of the traditional fossil methods of energy production.

There is currently an operation involving Dutch scientists, at Wageningen University. They illustrate CO<sub>2</sub>'s potential to produce power but do not provide the full solution. They do however, offer firm conceptual support. Harvesting CO<sub>2</sub> is a technique, they confirm, produces additional electricity. They have continued electrolysis experiments conducted 200 years ago, pioneered by Sir Humphry Davy and Michael Faraday. CO<sub>2</sub> is pumped through water with other liquids to produce a flow of electrons that flushes the CO<sub>2</sub> between porous electrodes to create electricity.



**CO<sub>2</sub>** can produce power  
no longer a waste  
emission

They have continued electrolysis experiments conducted 200 years ago, pioneered by Sir Humphry Davy and Michael Faraday. CO<sub>2</sub> is pumped through water with other liquids to produce a flow of electrons that flushes the CO<sub>2</sub> between porous electrodes to create electricity. When applied to electricity production, the harvesting process could provide an increase of approximately 1,750 terawatt hours annually from the 12 billion tonnes of CO<sub>2</sub> produced from power stations and from the 11 billion tonnes of CO<sub>2</sub> derived from other sources. The additional electricity is equivalent to approximately 1 billion barrels of oil power which is significant.

Output could be increased without emitting any additional CO<sub>2</sub> into the atmosphere. It is unclear whether the CO<sub>2</sub> is nullified but there are already several test operations where the exhaust from one cycle of electricity production is harnessed to increase the total amount of electricity produced within the process. The CO<sub>2</sub> vapour needs to be prevented from escape to be considered a solution. There are other projects that offer CO<sub>2</sub> removal, perhaps the techniques could be combined were removal required? The Massachusetts Institute of Technology, claim they have identified a way of removing carbon dioxide from a stream of air. The new system can work at virtually any gas concentration level. ("Engineers develop a new way to remove carbon dioxide from air: The process could work on the gas at any concentrations, from power plant emissions to open air", 2019).



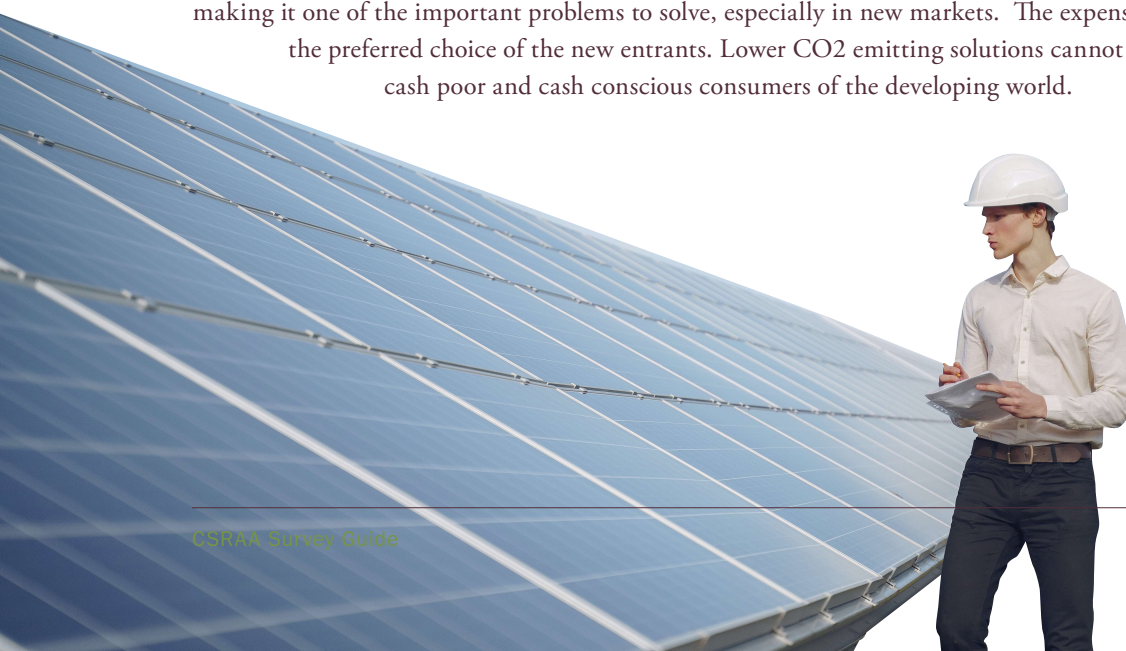
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The operation to make power from the CO<sub>2</sub> would occur within the chimneys of fossil fuel burning power stations where the CO<sub>2</sub> contained within the smoke could be extracted. The electrolyte, monoethanolamine, could be used to catalyse conduction, (Chen et al., 2017). Question marks remain about the detrimental impacts of monoethanolamine. The process requires closer assessment to confirm its safe use and biodegradability. The catalyst does however prove CO<sub>2</sub> can produce power. The chance of using a less toxic catalyst within the process with a smaller or no impact represents a target.

Dow industries reports; monoethanolamine causes burns to eyes and skin, is corrosive if swallowed and harmful if inhaled or absorbed through the skin. It can cause lung damage, and repeated exposure may cause liver and kidney damage. Monoethanolamine should not bio accumulate or persist in the environment. However, large releases to wastewater treatment facilities can result in toxic shock to biologically active species. Such processes, whilst less than ideal, have been resultant from a balance between impact and need. Now priorities are driven by a knowledge of side effects. Technology has the ability to change or reduce pollution impacts. Currently rejected power alternatives may become viable within the proposed aggregate power solution. Monoethanolamide may not be the answer but it provides incentive and suggests better outcomes are possible. CO<sub>2</sub> filtering could have numerous applications and is an example of technological developments that are occurring across all spheres.

Better performing batteries are particularly significant because of their ability to make renewable energy solutions more efficient and commercially viable. Dan Li, from Monash University, Melbourne, Australia, reports promising work of a graphene based super capacitor that is compact, quickly rechargeable and four times longer lasting when compared with conventional lead acid batteries. Such increased efficiency overcomes traditional hurdles for environmentally friendly alternative energies. Current low impact energy solutions are not universally applicable and do not work uniformly. What works in one country or in one application such as the hydroelectric platform in Norway, does not work everywhere, such as in a venue with no water and is suitable only for solar or wind applications.

Consumption of hybrid power is not, always, an affordable option. Nor does it have the required supportive infrastructure. Price sensitivity rather than environmental impacts remain the paramount motive for many customers making it one of the important problems to solve, especially in new markets. The expense of power means that coal is the preferred choice of the new entrants. Lower CO<sub>2</sub> emitting solutions cannot generally be afforded by the cash poor and cash conscious consumers of the developing world.



Dr. Laviziano, CEO of Rec Solar, founded in Norway and trading in Australia, explained, that 80% of solar demand is driven by the desire to reduce power bills whereas only 20% of consumers have the



luxury of their primary consumption motive being ethical support of lesser emissions and a lower environmental footprint. A balance between cost and ethics effects most areas. Perhaps it explains the rationale behind the US's withdrawal from the Paris treaty? There are numerous technological shortcomings and imperfections concerning power solutions. It may be the lifespan of a solar panel and or the negative impacts in disposal. It may concern the use of SR6 gas in wind turbines; nothing is perfect. Full disclosure enables consumers to make an informed decision

There are many cogs in the wheel. Numerous moving parts requiring evaluation. Government subsidies could provide finance so customers can afford more ethical products and services. Such finance availability would increase the demand and affordability of environmentally friendly solutions, that reduce negative pressures. A good example of a successful financing is the solar powered installation project in the university car park of Diablo Valley in the US. A long term purchase agreement was made available to the university at a rate lesser than the cost of using a coal based supply from the local utility. Coal presented the cheapest option.

It is easy to understand the drivers behind coal demand due to the cheap price. The price for one metric ton of thermal coal amounted to an average of 77.9 U.S. dollars in 2019. ("Topic: Global energy prices", 2020), and it might only be 4 cents per KWH in the third world as opposed to more expensive other power options. The price variations would be made insignificant to a consumer by a governmental finance option. Governments could ensure consumers receive a financial solution in order to deliver lower emissions at an affordable low cost.

Financial advantages of no upfront costs complemented a zero impact environmental solution. The financial terms created an alternative to the cheaper but higher emissions impacting solution. The offering was made by a local bank who owned the asset and was responsible for its upkeep. The power provider effectively diversified into a role traditionally associated with a bank. **Governments could fulfill this role** to provide an economic viable social solution. The assets eventually become the property of the university so the agreement was a lease agreement. The Australian Energy Council recently announced an economy wide net zero emissions target by 2050. Technology and moral economics can speed up the transition away from fossil fuels. One technology that is developing and worthy of mention is hydrogen power.

Hydrogen is the most common chemical in the universe. Hydrogen energy can be stored as a gas and can be delivered through existing natural gas pipelines. When converted to a liquid, hydrogen can be transported on trucks and ships. In September 2018, Australia announced an investment of \$22.1 million in funding for 16 hydrogen research projects. (2018).

"Hydrogen is set to play a much larger role in the renewable energy space not only in Australia, but globally as the world moves to a low carbon economy. The potential for hydrogen to be a carrier of renewable energy is substantial. The capability to supply renewable hydrogen at a competitive price is likely to lead to investment throughout the rest of the supply chain, including dedicated renewables for export." Mr. Frischknecht of Arena said, (Journalist et al., 2020). There are 543 projects totaling AUS \$1.58 billion invested currently.

Most projects have been under 1 MW. Renewable hydrogen from electrolysis costs about \$6/kilogram (kg) and has fallen about 60% in price since 2010. Time will tell regarding hydrogen's significance.





## SECTION 7: Water And Effluent Policy

There is only 1% of drinking water on the planet. A corporate with a large water footprint has a responsibility to neutralise its impacts. A balance between cost, profit, pollution and viability. This is one of the key areas where the acquisition of higher costs are rewarded by high scores and consumer support.

Water policy is a significant component of the CSRAA analysis. Water standards protect human and animal health as well as the ecosystem.

Corporate often uses water contractors but is ultimately responsible. The effluent processing, the methodology used and chosen is key. Discharges have to be monitored frequently, measurements have to be of a sufficient standard that they are accurate. Controlling water flow is an important aspect of the water and effluent policy.

Runoff occurs when there is more water than the land can absorb. Runoff can include sewage, medical waste and chemical pollutants. The runoff can contaminate the ecosystem. Toxic runoff can pollute rivers, lakes, underground and ground water supplies. Leachate, where water enters a tip, is effected by the type of the lining used, if at all.

Leachate, results from groundwater, waste decomposition and it can escape into the environment around landfills. Whilst risk has been reduced in newer designs, leakage through liners constructed with geomembranes can still occur, explains J.P.Giroud and R.Bonaparte, (1988). A simple guide is to ask the question, is the tip lined?

## SECTION 8: Biodiversity Policy

Healthy biodiversity involves prevention, management and remediation of any damage. The causes of damage can often be minimised through suitable protocols. The CSRAA calculation promotes a compliance with standards so that applicants are rewarded for their actions. Of significance is the way discharges are monitored. Are reported figures accurate, independent and objective ? Are the standards governing the area followed and are the standards themselves sufficient ? Does the corporate exceed the legislation requirements ?

## SECTION 9: Animal Welfare Policy

There are standards of compliance that are enforced by nationwide legislation. Animal welfare is also governed by individual state. The CSRAA question whether the correct procedures are followed, and investigate whether the regulations meet necessary standards. The CSRAA rating supersedes the minimum standards as set out by the Australian government. The rating survey identifies compliance with other regulations such as the standards of the United Nations and the CSRAA themselves. Issues include; standards in export, breeding, animal testing, slaughterhouse cruelty, factory farming, battery sheep ("Channel 10 News", 2011) and mulesing ("Italian garment makers go elsewhere for wool due to Australian sheep mulesing", 2018), the list is exhaustive. What seems apparent, is that behaviour deemed unlawful is either ignored and remains unpunished by legislators. Current Australian laws do not afford the necessary protection in the domain of agriculture and food.



Australians, generally, oppose whaling and killing seals for fur. Despite these and other strong moral stances, legally sanctioned acts of cruelty to animals happen every day in an acceptance of “codes of practice”. Animals raised for food are excluded from laws that protect cats and dogs.

The legal loophole excludes over 500 million animals every year. The Australian legal system currently does not provide animals protection against cruel treatment. We raise moral objections. Animal welfare should be improved within commercial activities. Evaluation revealed numerous questionable aspects such as the use of monkeys within the Thai coconut industry that are sold in Australian supermarkets. The price of coconuts relates to labour costs with monkey labour keeping pricing low. Cruelty is hard to fathom.



## SECTION 10: Pollutants Effecting Species

A responsible operational footprint involves producing minimal or zero impact. Changing the character of the environment that negatively effects any species that live in the area is not a sustainable or an acceptable long term strategy. A Corporate is well rewarded for causing minimal or no impact. Measurements and exposure of leakages are vital to confirm a neutral footprint.

## SECTION 11: Emission Policy

Emissions, Green House Gases (GHG) result from the discharge of substances into the atmosphere. Contaminants that enter the ecosystem affect the environments homeostasis. In particular, the performance of water vapour within the warming and cooling of the planet which can become out of equilibrium. Excess emissions carry regulatory fines. GHG's have negative impacts on the ecosystem, agriculture, animals, human health and air quality. What is important, involves whether discharges are monitored closely enough, independently and objectively? Also of concern, is whether fines within the enforcement infrastructure force compliant behaviour? Is the legislation itself, too lenient or sufficient?

The CSRAA advocate following industry standards as an operational minimum. Ideally, corporates should supersede governance with the use of technologies that reduce the level of emissions. Performance should be as close to zero impact as possible.

The emissions methodology within each process is assessed. Discharge measurements requires special equipment. The frequency and location of the sampling is important and should also be analysed. Measurement should indicate the presence of contaminants by time and site. There are numerous harmful gases to the environment.

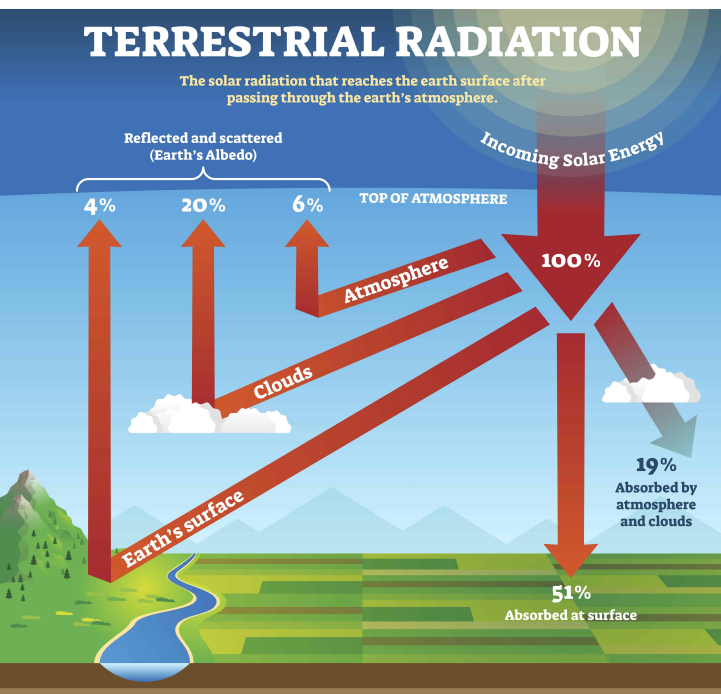
Understanding the greenhouse effect reveals the importance of the homeostatic process. The greenhouse effect, if unchecked, warms the earth's temperature to a level that it becomes unable to sustain life. The earth's health relies on the well-being of the ozone layer that traps gases near the earth's surface. The gases also absorb energy.





The sun's energy enters the atmosphere as shortwave radiation and travels down to the ground without reacting with any greenhouse gases. ("Greenhouse Effect | North Carolina Climate Office", 2020). The ground, clouds, and other surfaces absorb the energy. Then the radiation is released back towards space but it changes and becomes longwave radiation. ("Clouds & Radiation Fact Sheet", 1999).

As the longwave radiation travels upwards into the atmosphere, it is absorbed by greenhouse gases. The greenhouse gases emit long wave radiation, which is absorbed and emitted by various surfaces, including other greenhouse gases. ("The Earth's Radiation Budget | Science Mission Directorate", 2020). Eventually the radiation leaves the atmosphere; but some of the radiation is bounced back towards the surface of the earth. The reflected radiation warms the earth up. If the Earth's greenhouse gases increase in concentration, then the surface temperature rises more. **Global warming.**



The ozone layer comprises of ozone gas which is highly reactive and whose molecules are comprised of 3 oxygen atoms. "There are 3 ozone molecules for every 10 million air molecules. The layer acts as the earth's sunscreen, filtering out 98% of UV light." (Society, 2020).

In the troposphere, at the earth's surface, permanent gas quantities generally do not change from day to day. Nitrogen accounts for 78%, oxygen 21% and argon 0.9%. Gases like carbon dioxide, nitrous oxides, methane, and ozone are trace gases, accounting for about a tenth of one percent of the atmosphere, small but significant. There are also the man-made molecules present, chlorofluorocarbons, perfluorocarbons and hydrofluorocarbons. (Catling & Zahnle, 2020).

If the impacts of direct emissions on the ozone hole are neutralised, the damage should be totally repaired in 50 years. (Harvey, 2020).

Water vapour and 'normal levels' are a vital component for both the ozone layer's recovery and the planet's ongoing existence. Water is a unique gas within the atmosphere because it provides the necessary building block for life. It is central to atmospheric and biological processes. It represents a unique greenhouse gas because of its vital role. It can change function and become detrimental if the wrong conditions stimulate negative actions. Water vapour is the most abundant greenhouse gas. The National Aeronautics and Space Administration, NASA confirmed. Water vapour varies in concentration varies between 0-4% of the atmosphere. Nevertheless, it is constantly present in the environment. In the cold, dry arctic regions water vapour usually accounts for less than 1% of the atmosphere, while in humid, tropical regions, water vapour can account for approximately 4% of the atmosphere. ("NASA - Water Vapor Confirmed as Major Player in Climate Change", 2008).

Comparatively, Greenhouse gases concentrations vary daily. A small increase can strongly affect the global temperature and the long term status quo. Man-made chemical pollutants also catalyse and increase the impact of water vapour upon the ozone layer, increasing its destructive effect by 3 times. Normally, water vapour's convection and conduction is part of the earth's natural homeostasis operation. ("Frequently Asked Questions about the Ozone Layer | US EPA", 2018).

When pollutants effect water vapour performance, the process is out of equilibrium and becomes harmful if unchecked. “Water vapour does not control the earth’s temperature, rather it is controlled by the earth’s temperature which effects how the water vapour performs.” (It’s Water Vapor, Not the CO2 - American Chemical Society, 2020) Industrial operations influence the amount of water deposited in waterways and in the environment. Understanding water vapours role is integral to avoiding the creation of catalytic outputs that facilitate water vapour’s negative potential. It is critical to preserve water vapour’s equilibrium role which is vital to climatic homeostasis.

### ‘Water can exist as a solid, liquid or gas’

The primary sources of artificial greenhouse gas emissions are electricity, heat, agriculture, transportation, forestry and the manufacturing industries. Energy production accounts for most of the emissions featuring numerous gases. The main greenhouse gases exclusive of Water vapour are; Carbon dioxide, Methane, Nitrous oxide, Sulphur hexafluoride (SF<sub>6</sub>), PFC-14, (CF<sub>4</sub>) and Chlorofluorocarbons. Sulphur dioxide (SO<sub>2</sub>) is also worth a mention because of the size of its negative impact. SO<sub>2</sub> is an indirect GHG. There are nearly 90 other negative impacting gases. We detail the most common and significant.

Since the 1970s, the ozone layer has depleted between 15 and 20%. In order to limit global warming to less than 1.5°C, the Intergovernmental Panel on Climate Change (IPCC) estimates global GHG emissions will need to be net zero by 2070. SO<sub>2</sub>’s significance is documented by both Greenpeace, (“Invisible killer: Toxic sulfur dioxide hotspots revealed in Australia”, 2019) and NASA, (“Global Sulfur Dioxide Monitoring Home Page”, 2020), who have identified gas blooms in Australia and have calculated that Australian SO<sub>2</sub> pollution is 10th largest in world, 628 KT of SO<sub>2</sub> is produced annually.

**Methane** derives from eight main sources. The removal process is not a universal. The main methane sources are detailed individually. (Saunois, Jackson, Bousquet, Poulter & Canadell, 2016).

Greenhouse Gas	Lifetime (Years)	100-year Global Warming Potential	% of GHG
Carbon Dioxide (CO <sub>2</sub> )	Hundreds	1	76
Methane (CH <sub>4</sub> )	20	84	16
Nitrous Oxide (N <sub>2</sub> O)	114	298	6
Hydrofluorocarbon 23 (CHF <sub>3</sub> )	264	14,800	1
Sulphur Hexafluoride (SF <sub>6</sub> )	3,200	22,800	1
PFC-14 (CF <sub>4</sub> )	50,000	7,390	1

Emissions resultant from anaerobic decomposition in natural wetlands and the melting permafrost account for approximately 30% of the methane emissions. Once exposed, methane is 84-86 times more harmful than CO<sub>2</sub> and it circulates around the atmosphere for a timeframe of 20 years at which point it changes into CO<sub>2</sub>. (Gayathri Vaidyanathan, 2015).

It reacts with a free radical called hydroxyl causing it to change its chemical composition. It nevertheless, continues to do damage to the ozone layer for hundreds more years, but with less impact. Rice field emissions; account for approximately 8% of the methane emissions and livestock emissions produced from animal waste account for 27%.

Science Advances, claims selective breeding cows can produce less gas.





Enteric fermentation is a digestive process by which carbohydrates are broken down by microorganisms into simple molecules for absorption into the bloodstream of animal. Concerning methane emissions, there are several immediate and available improvements, some are being used overseas with success. The changes can be applied within Australia. Some are regulatory and others require the application of new technology. Numerous immediate solutions are available with the right incentive. An example being the native Queensland seaweed that stops cows burping methane. Adding *Asparagopsis* to the cow's diet reduces the amount of the gas the animal produces by up to 99 percent.

The algae diminished the microbes in cow's stomachs reducing their wind, pass air. Associate Professor Nicholas Paul from the University of the Sunshine Coast said, "when added to cow feed at less than 2 per cent of the dry matter this particular seaweed completely knocks out methane." A reduction of greenhouse gas emissions in Australia by 10 per cent is possible. ("Push to mass farm puffy pink seaweed that stops cows burping methane", 2019)

Biomass burning, forest fires, charcoal combustion, and firewood burning usually account for approximately 8% of the methane emissions. Although during the 2019 – 2020 season more than 12.6 million hectares across Australia burned. An average fire season in New South Wales is around 300,000 hectares. ("The magnitude of Australia's bushfire crisis captured in five big numbers", 2020). The impact has been significantly larger than usual. Anaerobic decomposition of organic waste in landfills account for approximately 16% of the methane emissions and fossil methane emission escaping during the exploration and transport of fossil fuels account for approximately 8% of the methane emissions. During power manufacture, the methane bi-product, is literally burnt off during production. ("Basic Information about Landfill Gas | US EPA", 2020). Only during delivery of the gas to the operational plant is there methane leakage that allows the gas to enter directly into the atmosphere. Natural gas powers and petrol account for approximately 21% of methane emissions and coal mining, account for approximately 8% of the methane emissions. The leakages can be captured with better design. In 2017, fugitive methane emissions from the coal mining industry represented 5.3 per cent of Australia's total net GHG emissions. ("Capturing fugitive methane emissions - ECOS", 2020).

The crossover point, when a kilogram of methane does as much damage as a kilogram of CO<sub>2</sub> is 3.4% of the total amount of gas discharged. Above this, the methane does more damage to the ozone layer compared to CO<sub>2</sub>. Leakage below 3.4% does less damage than a high emitting CO<sub>2</sub> provider such as coal power. ("Explainer: CO<sub>2</sub> and other greenhouse gases", 2018).

Wetlands cover about 9% of the earth's surface and contain around 35% of global carbon. Australian wetlands cover about 8 million hectares. They also contribute 30% of methane gas emissions. "Globally, wetlands are the largest natural source of methane." (Unexpected culprit – wetlands as source of methane | Soil Science Society of America, 2020).



Wetlands are sometimes unappreciated but represent a crucial barometer and are fundamental to preserve environmental health. Capture of CO<sub>2</sub> plus other emissions and storage of carbon within salt marshes removes CO<sub>2</sub> from the atmosphere. As the water level rises, more storage space is made available in the sink. Draining turns wetlands from carbon sinks into carbon sources. Changing their positive effect into a negative impact. “Carbon sequestration in these wetlands stores an additional five million tonnes of atmospheric carbon per year.” (Macreadie et al., 2017).

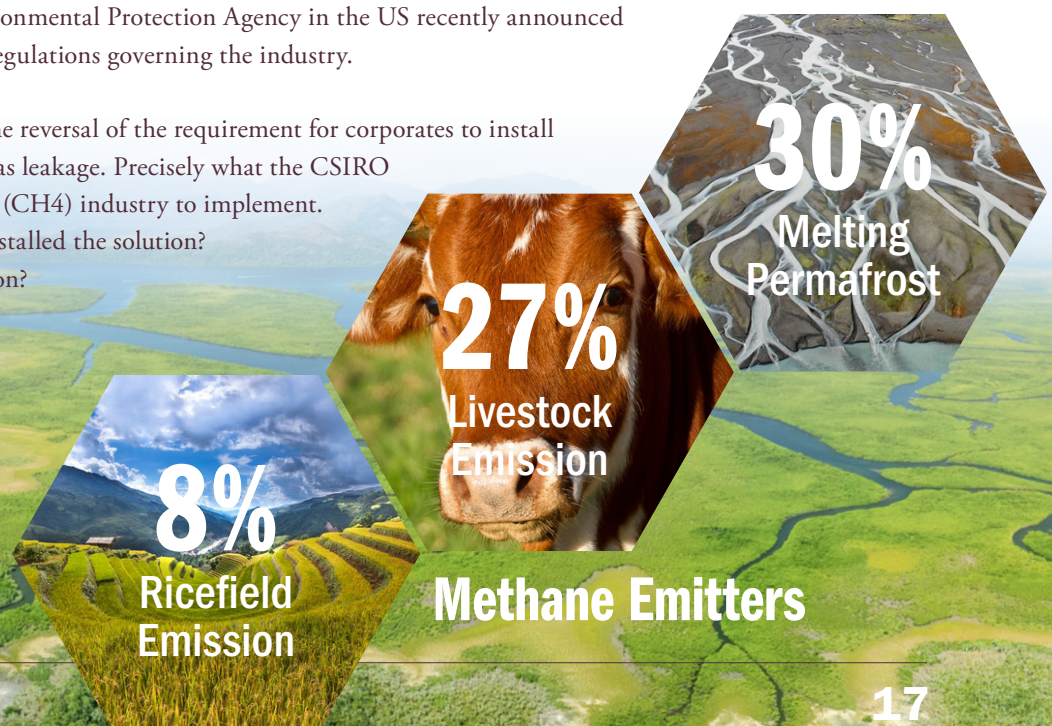
Wetlands protect our shores from waves, reduces the impacts of floods, absorb pollutants and improve water quality. They provide a habitat for animals and plants and many contain a wide diversity of life, supporting plants and animals. Wetlands are even more important in the southern hemisphere because of greater stability that resulted from the differences in relative sea level rises in the hemispheres over the past 6000 years. In the north, there was more melting of the vast ice sheets during the last glacial period.

The melting caused a flexure of the earth’s mantle as the weight of the ice lifted. Continents in the southern hemisphere were less affected by ice sheet loads. There are a number of competing theories concerning the main cause of the tectonic plate movement and shifting mantles which are associated with earthquakes and tidal waves. The lithosphere, the rigid outer layer of the earth, bends under the action of forces such as changes in ice thickness related to deglaciations or glaciations. (Society, 2020).

Wetlands perform many functions and are vital for environmental, economic, social and cultural reasons. The CSIRO has developed three ‘VAM’ methane capture technologies that mitigate methane emissions. CSIRO lead scientist and technology inventor, Shi Su, confirmed the three VAM technologies are complementary. A corporate may choose to use one technology or a combination. CSIRO’s technologies are world leading and have been developed and tested successfully at a large scale mine site. Could a variant be applied to other methane or alternative emission sources? Several research projects, including a \$7.1 million project funded by the Department of Industry, and a \$1.95 million project funded by Coal Innovation New South Wales proved the technology.

The US Department of Energy advocates the cleanliness of methane claiming for “every 10,000 U.S. homes powered with natural gas, there is an avoidance of annual emissions of; 1,900 tons of NO<sub>x</sub>, 3,900 tons of SO<sub>2</sub>, and 5,200 tons of particulates.” (Environmental Impacts of Natural Gas, 2020). Despite the negative impacts of methane, the Environmental Protection Agency in the US recently announced a rolling back of Obama-era regulations governing the industry.

Of particular significance is the reversal of the requirement for corporates to install controls to prevent methane gas leakage. Precisely what the CSIRO wants the Australian methane (CH<sub>4</sub>) industry to implement. Why repeal the cure having installed the solution? Why deny the need for filtration?





Daniel Varon, an atmospheric scientist at Harvard University, confirmed the significance of methane claiming “the development of an emission removal technology was an even more important consideration in light of the current US leadership’s stance against the existence of global warming resulting in the US withdrawal from the Kyoto treaty.” (Varon et al., 2019)

Negative impacts take many guises; one such effect is resultant from CH<sub>4</sub> emissions is thermokarst within the permafrost soils of the Arctic, aka, permafrost thaw, explains Walter Anthony et al, Gasser et al. 2018. The methane seepage from once frozen gas now thawing. Methane mixed with ice, forms methane gas hydrates. Often found trapped in layers of sediment on the ocean floor, beneath the permafrost and below the frozen lakes in the Arctic. These solid, ice-like deposits are a potential energy source, but they are also problematic because they can release large concentrated amounts of methane into the atmosphere. Methane concentrations in the atmosphere have increased by 150% from pre-industrial times, and continue to grow. One of the challenges for removing methane effectively is overcoming its low atmospheric concentration. It’s composition is only about 2 parts per million, whereas, by comparison, carbon dioxide is 415 parts per million, about 200 times higher. Chemical conversion of the 24 billion metric tons of methane into 48 billion metric tons of carbon dioxide annually, would reduce global warming pressures significantly, and reduce methane pollution by 15% each year. (“Thermokarst - an overview | ScienceDirect Topics”, 2017).

Methane is also leaked from mud volcanoes, rice fields and termites. Underground fossil fuel deposits that have housed methane over millions of years are storage sources. As these fuels are mined and harvested, so is the methane released. Transport regulations and the significance of filtration relates equally to these sources.

**Nitrous Oxide**, (N<sub>2</sub>O), is another significant GHG. One tonne of nitrous oxide is equivalent to 298 tonnes of carbon dioxide. Nitrous oxide has an atmospheric lifetime of 110 years. The process that removes nitrous oxide from the atmosphere also depletes ozone gas. So nitrous oxide is not only a greenhouse gas, but its removal is an ozone gas destroyer. Nitrous oxide comes from nitrogen-based fertilisers. About 1% of all the nitrogen fertilisers applied to the soil is resultantly emitted to the atmosphere as nitrous oxide. “Nitrous oxide with other elements creates acid rain.” US National Library of Medicine.

**Sulphur hexafluoride**, (SF<sub>6</sub>), is another significant GHG. SF<sub>6</sub> is synthetically produced and has a global warming potential of 22,800. One tonne of SF<sub>6</sub> in the atmosphere equals 22,800 tonnes of CO<sub>2</sub>.

SF<sub>6</sub> is used as an insulating gas in the electricity supply industry to prevent arcing in electrical switchgear. Emissions occur due to leakage, during equipment maintenance and decommissioning. Leaks during 2017, within the EU alone, was the equivalent of putting an extra 1.3 million cars on the road per year. SF<sub>6</sub> does not have a natural sink or any effective disposal methods, so once emitted, it accumulates in the atmosphere. The cherry on top is, its atmospheric lifetime can be up to 3,200 years.

Switchgears containing SF<sub>6</sub> are used inside wind turbines, suggesting that neither wind energy, nor solar electricity, can be claimed to be completely environmentally friendly. Despite the irony there is a need for a long term balanced view and perspective. An eco-friendly alternative to SF<sub>6</sub> using switchgears has been developed by Nuventura in Germany.





A redesign of the switchgear's basic principles, has reduced the quantity of SF6 in the design but it has not extracted SF6 switch gears from the market altogether. This is a major step to lowering invisible pollution each year explained Ottersbach in a paper questioning "Should the EU ban the world's most potent greenhouse gas?" (Why the European Union Should Ban SF6 | Energy Central, 2020).

In 2018, SF6 was included in the Kyoto Protocol's list of substances whose use and emission should be minimized.



**Chlorofluorocarbons (CFCs)** molecules, contain carbon, fluorine and chlorine. When exposed to ultraviolet light (UV) the molecules break down into separate parts and the chlorine literally rips apart the ozone molecules by combining with its oxygen component. This action accounts for ozone layer degradation.



The low temperature near the poles speeds up the CFCs damage. There are also the man-made chlorofluorocarbons molecules, often found in refrigeration coolants, that contain carbon, fluorine and importantly chlorine. The ozone layer degradation has been slowed and if the impacts of direct emissions are neutralised the hole should close in 50 years after a cessation of pollutants. (Lianne Kolirin, 2018). of 1430; this means the release of one tonne of HFC-134a is equivalent to releasing 1430 tonnes of CO<sub>2</sub> into the atmosphere.

Other synthetic greenhouse gases are even more powerful global warmers. HFC's are also used as foam-blowing agents in the manufacture of polyurethane foams and foams for thermal insulation. The synthetic greenhouse gas is released at the time the foam is blown and also results from gradual leaks during the lifetime of the foam. HFCs are also found as propellants in aerosols, such as asthma puffers. Fire extinguishers are also sources. [environment.gov.au](http://environment.gov.au) and ("Hydrofluorocarbon - an overview | ScienceDirect Topics", 2019)





**Perfluorocarbons** (PFC's) are man-made compounds also containing fluorine and carbon. They are generally colourless, odourless non-flammable gases and mostly chemically un-reactive. They are mainly used in the electronics sector in semiconductor manufacture, however there is also significant usage as refrigerants. The major gas release is from primary aluminium production.

The semi-conductor industry is a relatively minor source and there are other small emissions from the refrigeration sector. There is leakage during operation and in the destruction of equipment. Fire extinguishing systems also contribute to their quantity. PFCs have extremely high global warming potentials, 5,000 to 10,000 times that of carbon dioxide. The aluminium industry is the main source of Australia's PFCs emissions. ("What are PFCs and How Do They Relate to Per-and Polyfluoroalkyl Substances (PFASs)? | US EPA", 2020).

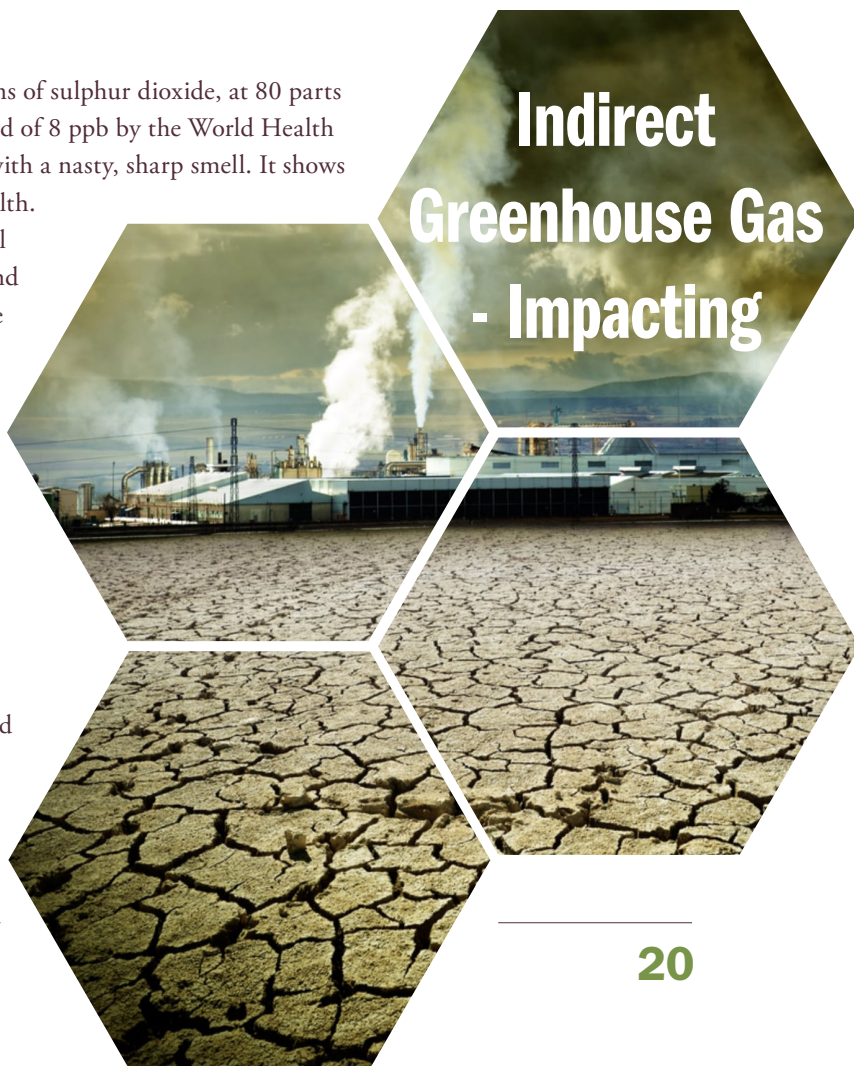
**Hydrofluorocarbons** (HFC's) are organic compounds that also contain fluorine as well as hydrogen atoms. They are frequently used in air conditioning. They contribute to global warming. The most common synthetic greenhouse gas in Australia is HFC-134a, which is mostly used in refrigerators and air conditioners. It has a global warming potential

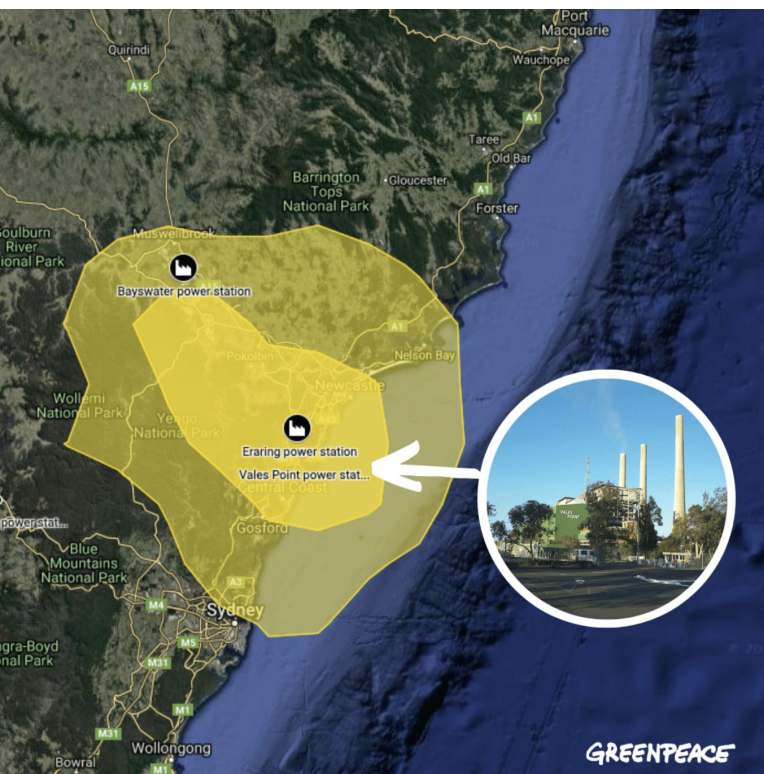
**Sulphur dioxide** (SO<sub>2</sub>) is significant globally, but seemingly ignored within Australia. It is an indirect GHG. Greenpeace calculate 696 KT of SO<sub>2</sub> is released annually within Australia. Globally, power stations burning coal and oil, refineries and metal smelters are responsible for two-thirds of the anthropogenic, SO<sub>2</sub> emissions.

Currently the Australian government allows emissions of sulphur dioxide, at 80 parts per billion (ppb) as opposed to the suggested standard of 8 ppb by the World Health Organization (WHO). SO<sub>2</sub> is a toxic, invisible gas with a nasty, sharp smell. It shows up on satellite imagery and is harmful to human health. It reacts easily with other substances to form harmful compounds, such as sulfuric acid, sulphurous acid and sulphate particles. About 99% of the sulphur dioxide comes from human sources. Most of the gas is emitted from a combustion of fossil fuel and oil in power plants. It is also emitted by trains, large ships, diesel equipment and volcanic eruptions.

SO<sub>2</sub> oxidises most pollutants which thins the ozone layer, cooling the earth and causing drought. ("Which Gases Are Greenhouse Gases?-American Chemical Society", 2005). A sequence of volcanic eruptions can increment the world into an ice age and can impair the oxidising capacity of the atmosphere allowing greenhouse gases to accumulate, exacerbating global warming.

## Indirect Greenhouse Gas - Impacting





Historically, every 20 million years or so, the eruptions overwhelm the oxidizing capacity of the atmosphere for tens of thousands of years or more, they cause mass extinctions. Humans burning fossil fuels are currently emitting as much Sulphur dioxide to be comparative to these pressures. Peter L. Ward, (“Sulphur dioxide initiates global climate change in 4 ways”, 2009). The creation of the tipping point.

The Australian Coal industry and the government should explain why Australian citizens are being exposed to SO<sub>2</sub> due to an absence of SO<sub>2</sub> filters within the coal industry when filters are present and are legally required by the Chinese, European and pre-Trump US governments who all fitted filters to prevent exposure of their citizens?

The atmospheric lifetime of sulphur dioxide is only about 10 days (IARC 1992) but due to the permanent production of SO<sub>2</sub> there is a constant supply of gas which creates acid rain and negative health impacts in the breathable atmosphere.

SO<sub>2</sub> is oxidized rapidly by both homogeneous and heterogeneous reactions. It is removed by precipitation and by dry deposition on surfaces, mainly as sulfuric acid. SO<sub>2</sub> gas reacts with water vapour in the air forming sulphuric acid which comes down in the form of acid rain. The acid droplets reflect sunlight back to space, which is exactly opposite to the effect of greenhouse gases. “Sulphur dioxide is a significant ingredient in the creation of acid rain.” explains the US library of Medicine, (Sulfur dioxide, 2020). It is because of this sunlight reflection and the fact that SO<sub>2</sub> is man-made it is classified as an indirect GHG.

“SO<sub>2</sub> is the most reactive gas in the environment. Not only does SO<sub>2</sub> do damage to the ozone layer but it also potentially damages biological health and is possibly responsible for 3000 deaths per year,” claims Dr. Eswald, GP and senior lecturer at the Newcastle University School of Medicine and Public health. (Cormack, 2019).

Even, government calculations fail to provide justification for non-filtered use. Combined health costs due to mortality and hospitalisation from 2010–2014 were between \$562 million and \$2,405 million, reported the National Environment Protection Measures (NEPM) government report. The negative impact of SO<sub>2</sub> emissions have been calculated at an even higher level between \$11 billion and \$24 billion per annum by the University of New South Wales.

Poignantly, Dr. Ewald, explained it is not prohibitively expensive to retrofit existing power stations with SO<sub>2</sub> capture technology, known as flue-gas desulphurisation. Aforementioned, “Post-combustion scrubbers are standard practice all around the world, except in a few places such as Australia. The licenses are so generous that power stations don’t have to have them.” The CSRAA cannot fathom this apparent logic. Can it really be true? If it is, what does it say about the value of human life to certain individuals?

The acceptance of higher emissions seems similar to the ideology, reasoning and rationale for the granting of licencing

of pollution. Supportive evidence of SO<sub>2</sub> pollution come from reputable sources including NASA, Greenpeace, Epidemiologist and GP, Dr Ben Ewald and Doctors for the Environment Australia. Even the Government agencies themselves have documented it.

The NEPM was recently reviewed for the first time since 1998, but environment ministers failed to effect any change or exact any new standards. NASA satellite images blatantly confirm the existence of sulphur dioxide, SO<sub>2</sub> blooms effecting both Melbourne and Sydney from coal-fired power stations. More than two million people are impacted reported Greenpeace, but this did not warrant any legislation change. In 2019, the British Parliament became the first national government in the world to officially declare a climate emergency. Other countries and jurisdictions have since followed and pledge to make the EU carbon-neutral by 2050. Perhaps the Australian government needs to consider things from a global perspective. The National Geographic commented, “previous mass extinctions came with warning signs. Those indicators were very similar to what we’re seeing now.” (Woodward, 2019)

Greenpeace comments “A high reliance on coal, oil, combined with weak emission standards and a lack of enforcement are typical of high polluting landscapes.” The World Health Organization stated in 2016. “Annually, 4.2 million people die prematurely globally from ambient, outdoor air pollution combined with another 3.2 million due to indoor and household air pollution.” Annually, the 696 KT of SO<sub>2</sub> emitted, places Australia amongst the world’s biggest contributors. There are 10 Australian identified sources within the top 500 global polluting sources, namely, (the number in brackets signals the position of the polluter in the world);

- (32) Mt Isa Copper, Lead, Gold, Zinc and Silver Mining, a cluster smelter and industrial mining complex producing 207 KT of SO<sub>2</sub> annually
- (49) Yallourn, Loy Yang A and Loy Yang B coal power stations, coal power station producing 151 KT of SO<sub>2</sub> annually
- (79) Latrobe valley, Vales Point and Eraring coal power stations producing 111 KT of SO<sub>2</sub> annually
- (91) Liddell and Bayswater coal power stations near Muswellbrook producing 91 KT of SO<sub>2</sub> annually
- (152) Gidji smelter, a gold roaster and West Kalgoorlie nickel smelter producing 53 KT of SO<sub>2</sub> annually
- (215) Tarong and Tarong North coal power stations producing 36 KT of SO<sub>2</sub> annually
- (291) Muja Coal power station producing 17 KT of SO<sub>2</sub> annually
- (306) Lithgow and Mount Piper power station producing 13 KT of SO<sub>2</sub> annually
- (319) Port Pirie smelter producing 10 KT of SO<sub>2</sub> annually
- (329) Stanwell coal power station producing 7 KT of SO<sub>2</sub> annually

An ice shelf recently collapsed, having melted, and reduced Canada by about 30 square miles in size. A direct result of global warming. Two of Canada’s ice caps, have disappeared recently, states USA today, (“Canada’s last intact ice shelf collapses due to warming”, 2020).

Temperature warming at a rate twice the speed of the rest of the world is behind the creation of the ice island and an overall 43% reduction in landmass which has seen the Milne Ice Shelf collapse into the ocean, explains the National Oceanic and Atmospheric Administration. (Campbell & Zaelke, 2020)

The ice sheet has drifted into the Arctic Sea in two large chunks, confirming the separation which is now part of a distinctive trend, explains CNN. (Haley Brink and Allison Chinchar, 2020).



**Plastic** is present in all the glaciers, evidence of micro plastics contamination. As the ice melts, it releases frozen plastics into the water. As many as 12,000 particles per 34 ounces of melted ice, are discharged, according to Melanie Bergmann, a marine ecologist with the Alfred Wegener Institute. (Bergmann et al., 2019). Deforestation and migration exposes viruses and bacteria, also side effects of global warming. Rory Gibb from the University College London, “identified an increase in zoonotic disease as a result of deforestation and migration of humans into new land resultant, including interaction with rodents, bats and song birds; habitat disturbance.” (“Land use changes may increase disease outbreak risks”, 2020).

Disease is also released from ice melts along with microplastics. The glaciers store disease that has been identified as 8 being million years old and alarmingly the organisms come back to life when thawed. “Long-dormant bacteria and viruses, trapped in ice and permafrost for centuries, are reviving as earth’s climate warms,” explains Jasmin Fox-Skelly New scientist. (Fox-Skelly, 2017).

Plastic pollution damages both the animals who have digested them, and contaminates them as a food source, potentially diseasing humans that eat the fish. The plastic turns into microplastic fragments foddered by orchestia gammarellus, tiny shrimplike crustaceans, or resultant from sun inspired photodegradation as identified by Richard Thompson of Plymouth University, (2013).

Microplastic pieces cannot be seen on satellite photography which delayed their exposure. The majority of rubbish and plastic ends up drifting on currents literally across the globe. Microplastics are located everywhere, from the Himalayas to the arctic but especially in the ocean. Plastics have only been manufactured since the 1950s but already “are choking our waterways.” Both plastics and chemicals represent negative impacts states Laura Parker, lecturer at University of Washington. (Society, 2020).

World production of plastic has increased from the original 2.3 million tons in 1950, to 162 million in 1993 and to 448 million tons in 2015. The amount of plastic drifting on the ocean and washing up on beaches, didn’t seem to be concur, it was only when Richard Thompson fathomed it out. The planet has about 9.2 billion tons of plastic; about 6.9 billion tons of waste and no one knows how much unrecycled plastic waste ends up in the ocean.



## Global Warming Is As Real As COVID



In 2015, Jenna Jambeck, a University of Georgia engineering professor, stated that between 5.3 million and 14 million tons each year is dumped, from land or in rivers and calculated about 8.8 million tons annually, which biodegrades between 450 years to never. The growth of plastic production has far outstripped the ability of waste management to keep up: That's why the oceans are under assault. "It's not surprising that we broke the system," (2015).

Ted Siegler, a Vermont resource economist, sums up the irrationality of it all, "We know how to dispose of it. We know how to recycle." (2018).

The Great Pacific Garbage Patch is a collection of marine debris in the North Pacific Ocean, also referred to as the Pacific trash vortex. The patch is three times the size of France. According to a three-year study published in Scientific Reports the mass known as the Great Pacific Garbage Patch is about 1.6 million square kilometers in size, says Marian Liu of CNN. (Marian Liu, 2018).

Marine debris is litter that ends up in the ocean, seas, and other large bodies of water. There are similar patches in every ocean of the planet. More of them. On many people, the idea of a "garbage patch" conjures up images of an island of trash floating on the ocean. In reality, these patches are almost entirely made up of tiny bits of plastic, although there are also significant sized debris present before it breaks down in size. The microplastics of the Great Pacific Garbage Patch can simply make the water look like a cloudy soup. This soup is intermixed with larger items, such as fishing gear and shoes. The seafloor beneath the Great Pacific Garbage Patch may be an underwater trash heap. Oceanographers and ecologists recently discovered that about 70% of marine debris actually sinks to the bottom of the ocean.

About 54 percent of the debris in the Great Pacific Garbage Patch comes from land-based activities in North America and Asia. 20 percent of debris in comes from boaters, offshore oil rigs, and large cargo ships that dump or lose debris directly into the water. The majority of this debris—about 705,000 tons—is fishing nets. More unusual items, such as computer monitors and LEGOs, come from dropped shipping containers. ("The Great Pacific Garbage Patch | The Ocean Cleanup", 2020).



## Glacier Melt Releases Virus



## There Is A Gyre In Every Ocean

Marine debris can be harmful to marine life in and around the gyre. For instance, loggerhead sea turtles often mistake plastic bags for jellies, their favourite food. Albatrosses mistake plastic resin pellets for fish eggs and feed them to chicks, which die of starvation or ruptured organs.

Seals and other marine mammals get entangled in abandoned plastic fishing nets, “ghost fishing.” (Society, 2019).

Dangers are compounded by the fact that plastics leach out chemicals and absorb harmful pollutants. As plastics break down through the photodegradation process, they leach out colorants and chemicals, such as bisphenol A (BPA), which has been linked to environmental and health problems. The absorption of pollutants, such as PCBs, from the seawater means they can then enter the food chain having been consumed by marine life. (Schechter et al., 2010). Since the Great Pacific Garbage Patch is so far from any country’s coastline, no nation takes responsibility or provide funds for removal. The National Ocean and Atmospheric Administration’s Marine Debris Program has estimated; 67 ships operating for one year would clean up less than one percent of the North Pacific Ocean. (Society, 2013).

The aforementioned virus and bacteria is dormant but climate change is melting permafrost soils that have been frozen for thousands of years, and as the soils melt they are releasing ancient pathogens. In August 2016, in Siberian, a 12-year-old boy died and twenty people were hospitalised after being infected by anthrax. Resultant from a heatwave and permafrost thaw. The thaw exposed a reindeer corpse and released infectious anthrax into nearby water and soil, and then into the food supply. More than 2,000 reindeer became infected, which then led to a small number of human cases. The fear is that this will not be an isolated case. In the 1890s there was a major epidemic of smallpox in Siberia. One town lost up to 40% of its population.

“Permafrost is a very good preserver of microbes and viruses, because it is cold, there is no oxygen, and it is dark,” says evolutionary biologist Jean-Michel Claverie from Aix-Marseille University in France. “Pathogenic viruses that can infect humans or animals might be preserved in old permafrost layers, including some that have caused global epidemics in the past.” (Fox-Skelly, 2015).

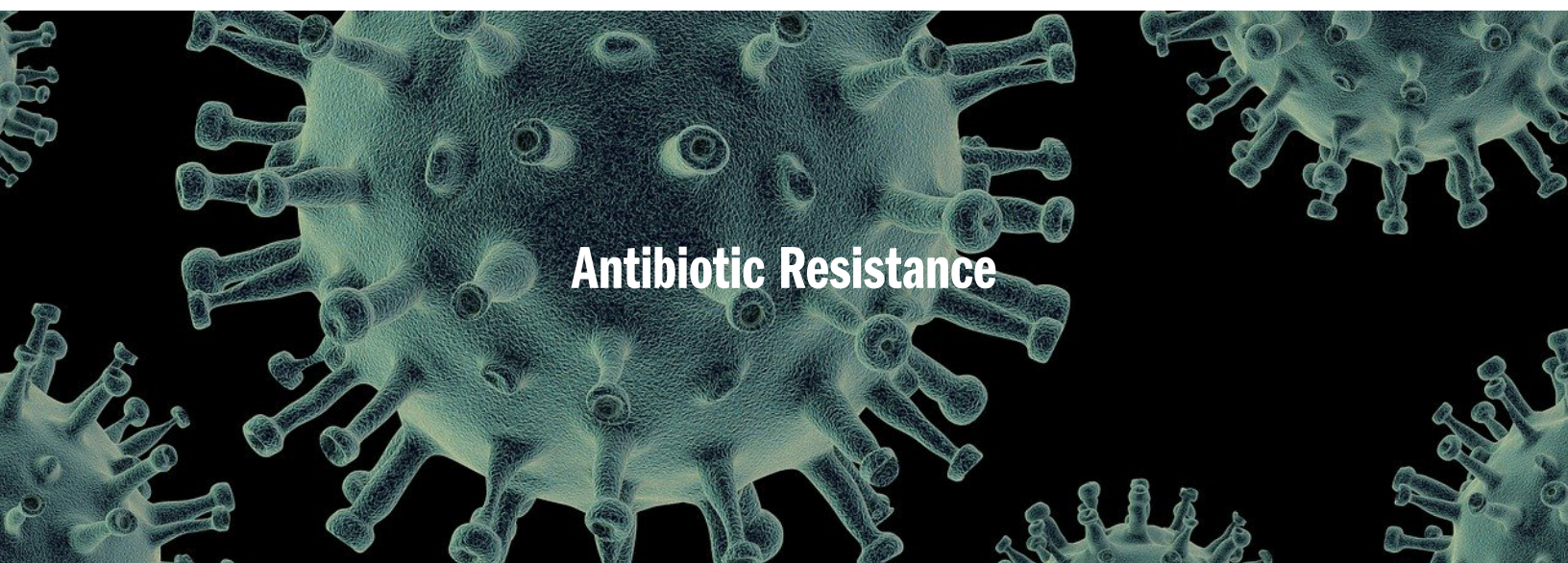
In the early 20th Century alone, more than a million reindeer died from anthrax. However, the big fear is what else is lurking beneath the frozen soil. Scientists have discovered fragments of RNA from the 1918 Spanish flu virus in



corpses buried in mass graves in Alaska's tundra. NASA scientists successfully revived bacteria that had been encased in a frozen pond in Alaska for 32,000 years. Bacteria frozen in ice have come back to life. Once the ice melted, the bacteria began swimming around, seemingly unaffected. Once they were revived, the viruses quickly became infectious. Shave even managed to revive an 8-million-year-old bacterium that had been lying dormant in ice, beneath the surface of a glacier in the Beacon and Mullins valleys of Antarctica. (Fox-Skelly, 2019).

As the Arctic sea ice is melting, the north shore of Siberia has become more easily accessible by sea. As a result, industrial exploitation, including mining for gold and minerals, and drilling for oil and natural gas, has now becoming profitable and new areas are being drilled. "At the moment, these regions are deserted and the deep permafrost layers are left alone," says Claverie. "However, these ancient layers could be exposed by the digging involved in mining and drilling operations. If viable virions are still there, this could spell disaster."

A big IF. Timing right now should be considered and centrally controlled, all over the planet from Siberia to Mexico? NASA scientists have also found 10-50,000-year-old microbes inside crystals in a Mexican mine, in February 2017.



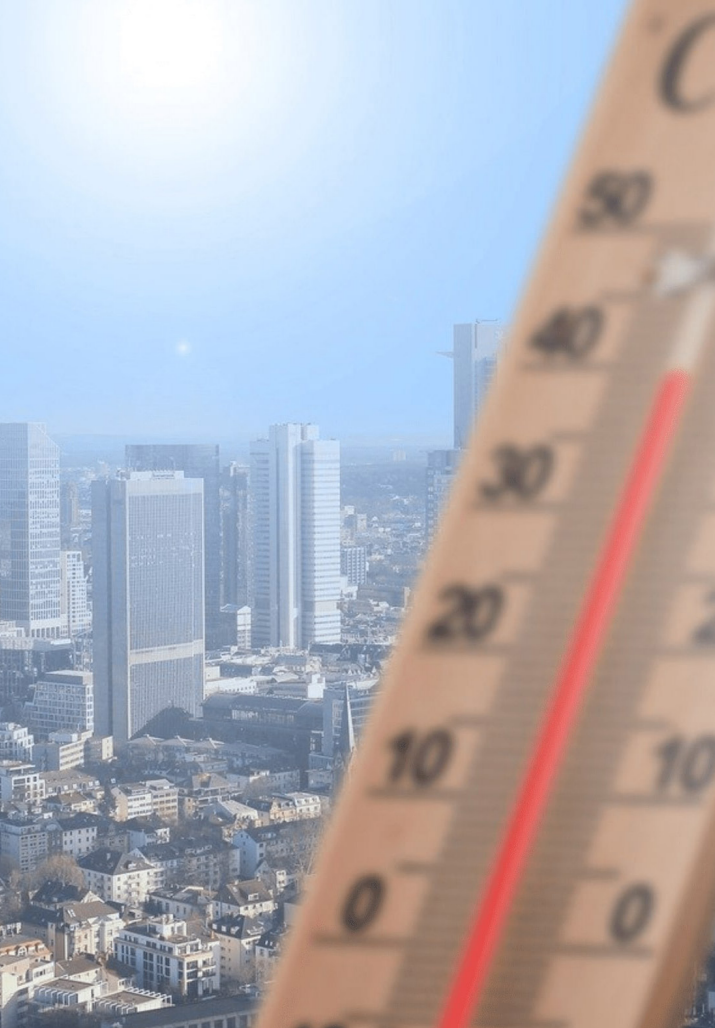
The bacteria have somehow become resistant to 18 types of antibiotics. The bacteria were located in the Cave of the Crystals, part of a mine in Naica in northern Mexico.

Even older bacteria have been found in the Lechuguilla Cave in New Mexico, 1,000ft underground. These microbes have not seen the surface for over 4 million years. The cave never sees sunlight, and it is so isolated that it takes about 10,000 years for water from the surface to get into the cave. ("NPR Choice page", 2016).

Antibiotic resistance has been around for billions of years. As the earth warms northern countries will become more susceptible to outbreaks of "southern" diseases like malaria, cholera and dengue fever, as these pathogens thrive at warmer temperatures. (Drexler & (US), 2019).

"Following our work and that of others, there is now a probability that pathogenic microbes could be revived, and infect us," says Claverie of his research, (Legendre et al., 2014).





The Intergovernmental Panel on Climate Change says we can expect the oceans to rise between 10 and 30 inches (26 to 77 cms) by 2100 with temperatures warming 1.5 °C plus. NASA and European data predicting an even greater rise of 26 inches (65 cms) by the end of this century. That could cause entire states and even some countries to disappear under the waves, from Florida to Bangladesh. (Lynch, 2020).

Worst case, floods and rising sea levels change caves into disease portals that then become food chain influencers. It bad enough being served micro plastic toxins, or radioactive fish from Fukisheema, but now there is the very real potential of being asked to swallow fish with new disease from flooded caves or frozen glaciers.

S. Levy of the national bureau of economic researchers explained climate also effects population distribution. "Climate will change population distribution, with the less liveable land being within the poorest regions." ("Impact of climate change on public health: Health consequences of climate change: Doctors urge action to help mitigate risks and prepare for new challenges", 2016). Higher temperatures create strong migratory pressures.

Luck, ethics, operational good decisions, morality and voting for the right people are all required. A corporate has a large footprint and an equal responsibility to optimise and lower impacts. There is always a balance between cost, profit and viability. In this area, as with others, higher costs of operation producing lesser impacts should be rewarded by consumer support.

A key issue involves ongoing assessment of whether discharges are monitored closely enough, independently and objectively and are of a sufficient standard. Are the laws and legislation enforced adequately and are they stringent enough for purpose?

Rainfall entering a landfill and its effect on the amount of leachate it creates, raises significant questions. There is also concern about the dispersal and treatment of the leachate. Treatment usually involves a choice between incineration or simply reintroducing the leachate to the environment in an untreated form. (2014).

Incineration produces numerous high impact negative outcomes. Dioxins are the most lethal persistent organic pollutants which present environmental health consequences for the bio system. Dioxins are particularly harmful to humans and animals.

A corporate has an obligation to ensure that it's choice of tip design uses an impenetrable barrier. Corporates should ensure a policy of minimisation as per the Royal Commission on Environmental Pollution which endorses a strategy of "Reduce, Reuse, Recycle." A corporate should ensure that it only uses an approved government tip.

## SECTION 13: Environmental Policy

The environmental policy provides a mandate that governs operation. The policy details procedures that are applied within each individual section. The areas are independent but function within an overall philosophy. The policy provides a blueprint. Corporates should minimise negative actions to meet with ethical standards and align with the demands and attitudes of the market place.

Corporates should act responsibly and avoid negative deeds and not support of any entities who use unethical practices. Corporate impact with regard to their environmental presence is one of the key components in the CSR rating. It reveals the corporate's compliance with government regulations, the United Nations Paris protocol and with the standards of the CSRAA. Operations are appraised against a zero impact footprint and the United Nations identified need for global temperature reduction. ("Sustainable consumption and production", 2019).

Impacts that effect the environment are all assessed and "greenwash," to appear ethical without merit, is interpreted.

Some impacts do not directly affect the global temperature but they can still have a significant negative effect. Examples of areas that can produce a detrimental effect is the process of fracking, pesticides, nuclear accidents or radiation disposal. The list is exhaustive. If you are innocent, the rating will greatly assist you. If you have been culpable, or naïve, we can help you change, for everything's sake, even your bank balance.

Government fines and sanctions for non-compliance with environmental regulations exist but the association assesses whether the processes go far enough and whether corporates could do more than follow legislation so as to minimise their impacts. Additional actions demonstrate an attitude and ability that signifies a moral interpretation of a situation. This rationale is not limited to this area and should be encouraged and applauded.

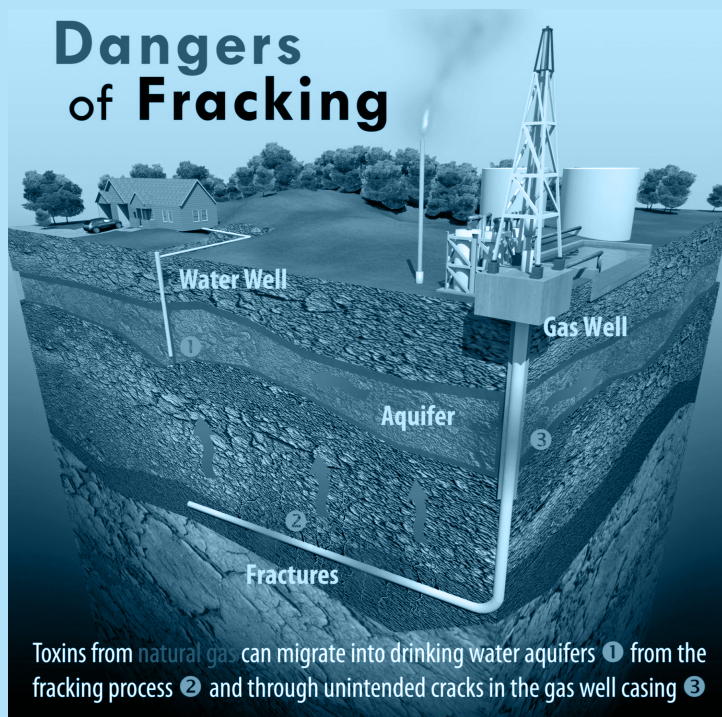
A system that issues a permit that allows for the disposal of a ship in the sea and costs only AUD \$12,000, from the Department of Environment, must be explained. Licenses are even granted to the world's largest commercial scale carbon dioxide injection project which involves a corporate that was once a previous member of the Global Climate Coalition (GCC) between 1989 and 2001.

The GCC were a group of businesses that opposed any action to reduce greenhouse gas emissions. It even publicly challenged the science and authenticity behind global warming. The GCC eventually disbanded, claiming "its mission had been successfully achieved. Both (the US) congress and the administration agree that the U.S. should not accept the mandatory cuts in emissions required by the Kyoto protocol." ("Global Climate Coalition", 2020).



Kyoto was the forerunner to the Paris treaty. Perhaps the GCC influence remains and serves to explain President Trump's recent action concerning the US's withdrawal from the Paris treaty? It would also explain the absence of US government figures from UN calculations?

In Australia, fines are levied against unsanctioned pollution but permits to pollute can be simply purchased from the government. The process has become a legitimate part of business operations. Corporations factor liability, legislation and fines into their operational budget. The CSRAA encourage corporates to desist and avoid negative impact. Encouraging a bottom line where money earned from higher sales attained from doing the right thing is desired. The CSRAA rewards corporates who align sales and profit with ethics. Customers recognise their actions as do the staff.



Coons rebranding and the end of the Washington Redskin franchise reflects the commercial relevance of ethics. Both actions are reflective of societal changes. The CSRAA rating allows you to promote and benefit from decency. Integrating an ethical aspect into your marketing message synergises a corporate with the needs of the world and current consumer trends.

Unsanctioned pollution requires proof before effective litigation. Larger cases take in excess of 1 year to process. There are insufficient legal and preventative resources to ensure prevention. In Victoria alone, between 2017 -18, there were only 11 convictions made by the Environmental Protection Authority.

Spending time and resources chasing accidents or unscrupulous pollution over and above the agreed licensed level is not a department priority. True intention to protect the environment has to be supported by an adequate legal system to afford protection. Commercial success involves embracing the values of the majority.

Regulatory enforcement and the issuing of significant fines exist in Australia. However, the Environment Protection Authority is part of a system that punishes only those acting beyond to the letter of the law. There is a difference between a system that has high levels of “acceptable” pollution levels. How does the government plan to reach the agreed United Nations targets deemed necessary for Paris treaty compliance, especially when post emission level review, for the first time in a decade, 2020, the governmental National Environment Protection Council of atmospheric pollutants made no changes to regulations governing acceptable SO<sub>2</sub> levels? It is noteworthy, that SO<sub>2</sub> is banned in China. Europe and the US, whereas it is deemed acceptable in Australia. (“Sulphur pollution claim is somewhat true”, 2019).

The CSRAA questionnaire reveals an individual corporate's emission contributions and reveals their attitudes to the environment.



Concerning fracking, it is important to understand the industry's operational structure as gas is sourced from both fracking and mining. Of particular significance since natural gas is endorsed by the CSRAA (not fracking) as a part of an immediate low impact solution to power aggregation and global warming.

Fracking side effects might not have a direct negative and attributable effect on global temperature but the CSRAA considers them unacceptable due to other damage the process causes; earthquakes, water pollution, and air pollution. (Loki, 2015).

“Toxic chemicals used in the hydraulic fracturing process are not fully removed and between 20% and 40% of the water used, returns to the ground surface, negatively affecting soil, vegetation and contribute to the shrinking of the water supplies,” explains Dr. Barry Stevens, (“Unconventional Oil and Gas Regulations and Policy - Fuels Market News”, 2014).

Only 1% of the world's water supply remains available for human use and there are no penalties issued for action causing harm to this resource. The side effects of fracking are guaranteed. (2018).

By comparison, the nuclear industry, which is listed as part of the low emitting solution, has less negative impacts compared to other available choices. Nuclear industry side effects only result from accidents or improper waste disposal. To date, the world has been able to survive some horrendous radioactive effects. The nuclear record, whilst less than ideal, implies the nuclear industry can perform as a piece of the solution, permanently? if the French safety record can be emulated and the ITER project succeeds. The inclusion of the nuclear industry within the immediate solution gives the world hope of lowering emissions and reducing temperature pressures straightaway. It might not be ideal, but it provides a current solution that can be acted upon now. If less trees had been harvested or world economic growth could be slowed, a nuclear footprint would not necessarily be required.



**The Next Tree Cut  
= 100kg of Oxygen**

There is hope afforded by hybrid technologies due to their ability to create power without generating CO<sub>2</sub> pollutants but their current low output ability means nuclear and non-fracking sourced natural gas needs to be included. There are positives presented by artificial photosynthesis which reduces CO<sub>2</sub> in the atmosphere. The importance of artificial photosynthesis has increased exponentially due to deforestation and the pressure being placed upon the remaining trees. Diminishing tree numbers lessens their combined ability to remove CO<sub>2</sub> from the atmosphere.

The amount of CO<sub>2</sub> released as a by-product from a trees destruction compounds trees' significance and is often unappreciated. Investment in reforestation, whilst noble, does nothing to prevent CO<sub>2</sub> release during harvesting, and the ability to photosynthesis at the level of a 'mature' tree takes the growth replacement time.

The importance of trees is further compounded by the expected increase in forth coming demand for power from a minimum of 600 million new consumers in China, Africa, India and Indonesia.

An increase in CO<sub>2</sub> will result, since the power supply will be from coal as it is currently the cheapest source of power. This will only change if finance, making a less environmental impacting power solution, becomes available. The annual CO<sub>2</sub> figures could be even larger than reported as the figures of India, China and United States are all absent from annual reported levels which suggests the situation is actually worse than the one being reported.

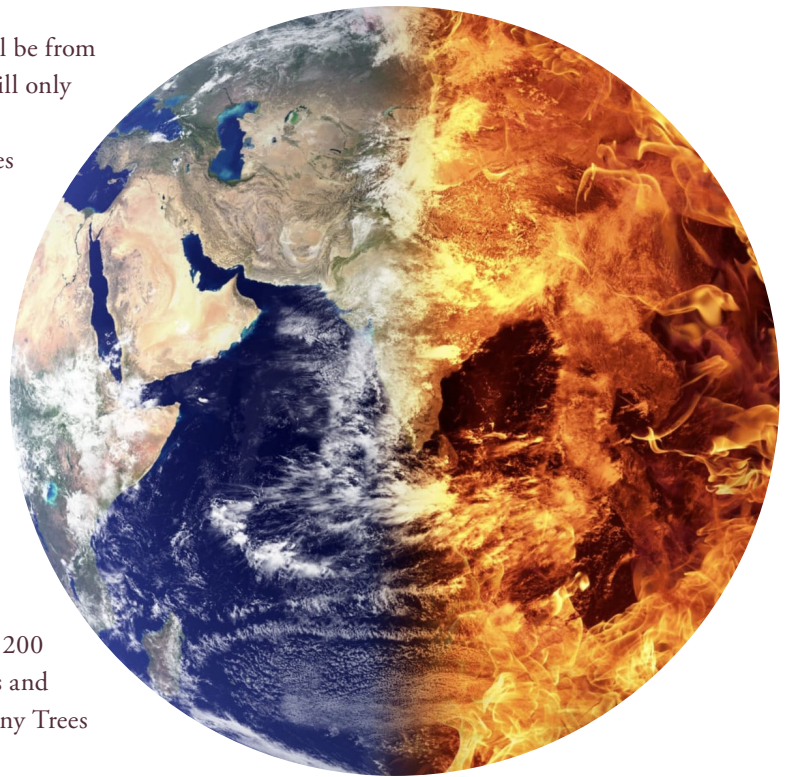
Currently there are about 3 trillion trees on the planet covering about 31% of the land mass. The trees absorb CO<sub>2</sub> and discharge oxygen. Each year loggers cut down about 15 billion trees, an annual loss of 18.7 million acres, 30 soccer fields per minute, ("Deforestation and Forest Degradation | Threats | WWF", 2019).

At the current rate of removal there will be no trees left in 200 years claims the World Wildlife Fund, the United Nations and Thomas Crowther from Yale University. ("Here's How Many Trees Humans Cut Down Each Year", 2020).

The development of artificial photosynthesis and CO<sub>2</sub> recycling becomes more important with every tree removed as the earth needs to preserve not lose its ability to remove CO<sub>2</sub>. The continuance of logging combined with the fact that there are no other immediate solutions for removing CO<sub>2</sub> from the atmosphere makes trees vital to survival. There is probably a lot less than 200 years before significant life impacting side effects are experienced. Before all the trees are gone the absence and the effect on global temperature will be felt; glacier melt releasing methane and more earthquakes are just 2 examples of compounding side effects. An exact date cannot be predicted.

When a tree is cut down it has 2 negative effects, stored CO<sub>2</sub> is released into the atmosphere, 1.5 billion tons per year from the 15 billion trees harvested annually. The capacity for the trees to continue photosynthesis role is also lost.

Even if we stopped burning fossil fuels today, there is still enough carbon dioxide in the atmosphere to keep temperatures rising for the next hundred years, during which time the temperature of the planet will increase by





3 degrees. (Forests and Climate Change, 2019). Other global temperature pressures are not factored in, which is downright scary.

CO<sub>2</sub> does not discharge naturally and must be removed. Photosynthesis of some type needs to occur. Predictions do not make allowance of; increased logging activities, fire destruction such as the 18.2 million hectare lost this year in Australia alone (“On average bushfires burn an amazing 50 million ha every year in Australia « JoNova”, 2020), or the effect of other negative impacts. The simple fact is; we cannot replace the trees photosynthetic effect and the tipping point might be the next tree cut down.

A tree produces 100kg of oxygen per tree per year. A human breathes about 9.5 tonnes of air annually, about seven or eight trees’ worth. The planet needs all of its trees, all 3 trillion of them. In 1912, Italian scientist, Giacomo Ciamician, initially identified a fossil fuel relationship with trees. Artificial photosynthesis study was born. Mitsubishi Chemical and the United States government recently allocated their Department of Energy a budget of \$122 to continue the study.



The CSRAA supports the concept of using CO<sub>2</sub> within the manufacturing process instead of emitting it as negative impacting pollution. Including the gas within the manufacturing process increases the efficiency of a power system, even meaning that coal has still a role to play, when the CO<sub>2</sub> by product can be managed. Surely the coal beneficiaries can be encouraged to invest in finding and providing technology to preserve their role via the banishment of CO<sub>2</sub> in the power process, and helping to save the world at the same time?

The coal magnates should consider this positive action or face the chance of termination, in a similar way that the Germans plan to remove the coal energy industry by 2038. (“Germany agrees to phase out coal power by 2038”, 2020).

The Global Carbon Capture and Storage Institute explains that currently the world can only capture 28 million tonnes artificially annually whereas there is actually 3 to 4 billion tonnes of carbon dioxide requiring removal.

The Institute states that to keep climate change in check, the process will need to effectively handle 6 million tonnes of CO<sub>2</sub> annually by 2050. A considerable increase of between 9000 to 18,000 times.

(URGENT ACTION IS REQUIRED TO ACHIEVE CLIMATE CHANGE TARGETS CARBON CAPTURE AND STORAGE IS VITAL, 2019). The lack of a current solution and the growth in the amount of CO<sub>2</sub> identifies the size of the problem, in just that one area.

The Centre for Negative Carbon Emissions is developing technology that is 1,000 times more effective than trees, but it is expensive, removing CO<sub>2</sub> for a cost of about \$100 a tonne. (“The Tiny Swiss Company That Thinks It Can Help Stop Climate Change”, 2019). The process importantly fails to possess immediacy.

Since 2007, the investment in carbon capture and storage has been less than \$20bn, about one-hundredth of the investment into renewable technologies. Bill Gates, however, is a notable investor and his involvement is indicative of the potential and a validation of the importance CO<sub>2</sub>. Regardless of CO<sub>2</sub> future potential, a solution is needed now. Providers can be added to the any positive action as their concept matures. Uniform legislation protecting the health of the earth such as the United Nations International Law could be initiated. The CSRAA has a role to play within Australia and environmental compliance can be achieved through economic evaluation of morality.

Global legislation addresses many key issues. Financing solutions to enable socially responsible options are required. Corporates need to aware of the benefits of a positive CSR stance. When there is no current solution, a valid question might be, why do we allow people continuance? In the example of trees, why cut down trees without being able to replace their role? Oxygen is essential to all.



Adam Scaife of the UK Met Office stated “this year’s climate temperature forecasts are in exceedance of the 1.5C threshold level set out in the Paris climate agreement. There’s a 10% chance of the temperature increase being permanent within the next five years. The temperature increase is occurring faster than expected and it means we are getting close to the threshold.” (“World headed for warmest period on record”, 2019).

The Intergovernmental Panel on Climate Change explained that “going past 1.5C is dicing with the planet’s live ability. The 1.5C temperature guard rail could be exceeded in just 9 years, by 2030.” (“The Economics of 1.5°C Climate Change”, 2018).

The calculation is based on Parisian calculations and do not include key statistics which could mean we are even further down the track and closer to the tipping point.

Petteri Taalas of the World Meteorological Organization stated, “Temperatures are only part of the story. Greenhouse gas emission reduction and climate adaptation measures should be a top global priority.” (“Petteri Taalas, Secretary-General at the WMO: The most important way to stop the climate change is to reduce the use of fossil fuels”, 2019).

Dr. Anna Jones at the British Antarctic Survey stated “Temperatures across the globe are at a record all-time high, due to rising concentrations of greenhouse gases, such as carbon dioxide, resultant from our continued use of fossil fuels. Until we reduce greenhouse gas emissions, we can expect to see upward trends in global temperatures. (“Nobody knows what’s triggered it: Scientists struggle to explain strangely shaped Antarctic ozone hole”, 2019).

Kaisa Kosonen of Greenpeace commented “Scientists might want to write in capital letters, ‘ACT NOW, IDIOTS,’ We are already in the danger zone. Both poles are melting at an accelerated rate; ancient trees that have been there for hundreds of years are suddenly dying; This is the moment where we need to decide. This is the moment that we will

remember; this is the year when the turning point happened.” (Hurst & Hurst, 2018).

There is no time left for debate and we cannot afford to be complacent or take the wrong path. The window of opportunity remains open, but action must be now. We can take inspiration from the successful fall in CO<sub>2</sub> emissions in the UK, showing a reduction is still possible. Britain’s Green House Gas levels in 2017 were 2.7% lower than in 2016 and 42.1% lower than in 1990. (“Climate change: UK CO<sub>2</sub> emissions fall again”, 2019).

An embracement of technology, directional planning, correct goals and immediacy, a reduction in nationalistic behaviours and a movement towards a profit system built on ethics yields the solution.

#### SECTION 14: Carbon Footprint

The Carbon footprint is an important Corporate calculation that can sometimes require engineer instrumentation to provide proof of figures. A measurement legitimises the corporate ethos and shows a commitment to CSRAA values.

The identified amounts become yardsticks. What is key here and true of other areas relates to whether discharges are monitored accurately enough as well as being validated independently. Are the taken measurements of a sufficient standard? Are the laws and legislation stringent enough for purpose?

#### SECTION 15: Occupational Health And Safety Policy

Health and safety protection is endorsed by national and international regulations. Customers have a reasonable expectation that products and services should perform as expected and should not pose a risk to health and safety in their production or at use. A Corporate also has an obligation to preserve the health and safety of their staff.

These sentiments are at the core of the regulations. The CSRAA reveals whether a corporate is compliant with standards or even if those regulations are superseded. Higher governmental standards in this section compared to other areas suggests a relationship between enforcement and electoral appeal. A higher level of governmental performance identifies the importance and developed state of Australian OH&S.



#### SECTION 16: Suppliers

Corporates should assess both their internal and external supplies from office stationary to all provided equipment. Corporates are rewarded with an improved CSR score by ensuring that their suppliers adhere to the same standards that the parent corporate. (Assuming they are CSR compliant) adhere to.

Suppliers should consider acquiring and presenting their own CSRAA rating to complement partner results and to help provide operational transparency. The principal corporate might consider subsidising the costs of an assessment because of the associated benefits to their sales and marketing.



## SECTION 17: Staff Training And Education

A corporates' main asset for economic performance is also one of the key components in a strong CSR value. Staff now look for a supportive infrastructure within their chosen workplace as well as an ethical footprint. The employer should be fair and without bias.



**BLACK LIVES MATTER**

## SECTION 18: Corporate Discrimination

An appraisal of the corporates attitude towards discrimination determines an important part of their CSR ideology. In Australia between 2016-17 the government commission received 1939 individual complaints.

39% of complaints were lodged under the Disability Discrimination Act, 24% of complaints were lodged under the Sex Discrimination Act, 21% of complaints were lodged under the Racial Discrimination Act, 8% of complaints were lodged under the Australian Human Rights Commission Act and 8% of complaints were lodged under the Age Discrimination Act. (2017).

These are the main areas and issues in the workplace for assessment. Government legislation suggests strong public interest in this area. Compliance is visible and of highly impactful. Corporate compliance within this area seems apparent as the regulations are in place but performance is still difficult to accurately assess. Many laws have been repealed but the racial discrimination act of 1975 still has section 18D. ("At a glance: Racial vilification under sections 18C and 18D of the Racial Discrimination Act 1975 (Cth) | Australian Human Rights Commission", 2020).

The CSRAA is attempts to measure any difference between the reality and legality. Black lives matter and the ongoing gender issues, amongst others, reiterate the significance of this key area to both customers and staff. A legal record is not always reflective of reality, nor is an individual's behavior representative of the corporate culture.

## SECTION 19: Corporate Privacy Report

Customer privacy standards are governed by national regulations such as the OECD Guidelines for Multinational Enterprises. To respect consumer privacy and take reasonable measures to ensure the security of personal data that corporates collect, store, process or disseminate provides another CSR yardstick.

## SECTION 20: Collective Bargaining Policy

The Australian Competition and Consumer Commission (ACCC) regulates collective bargaining under the Competition and Consumer Act 2010 (formerly the Trade Practices Act). The collective bargaining process allows a corporate to negotiate a deal with one or more competing businesses for the sale or purchase of products or services with a common customer or supplier.

A corporate can include a price agreement in the negotiations, however a small business may not be able to supply enough volume to a large purchaser and the action of teaming up with another small business can open new market opportunities. By negotiating as a group, small businesses may qualify for discounts larger than they would receive individually. The ACCC allows collective bargaining arrangements where the agreement provides public benefit. Analysis of collective bargaining practices involves an evaluation of the CSR component.

## SECTION 21: Child Labour Policy

State and or territory laws govern the age and type of work available for a young person. Child labour laws are similar in principle to occupational health and safety laws. The Federal Fair Work Act 2009 generally applies and complements the Fair Work Act. Government Regulation and enforcement is seemingly strong in this area.



## SECTION 22: Operational Security Policy

Operational security is also known as procedural security. It protects sensitive information from threats to commercially sensitive information. Threat nullification complements traditional security. The use of on or off site security reflects a revealing CSR attitude. The area offers an internal training opportunity.

## SECTION 23: Indigenous Policy



An Indigenous policy protects the rights of Indigenous peoples. The United Nations declaration on the rights of Indigenous peoples and the International Labour Organization convention guidelines states that Indigenous peoples have collective and individual rights. Respect and evidence of these guidelines have significant CSRAA value.

Australian Aboriginals represent 3.3% of the total population. An estimated 798,365 Aboriginal and Torres Strait Islander people currently live in Australia, according to the last survey in 2016 by the Australian Bureau of statistics.

Aboriginal culture is one of the oldest in the world between 50,000 and 300,000 years old. It is worth acknowledging





Aboriginal lifestyle and values are different to the west. The concept of dreamtime and a central tenet of belief in the interconnectedness and unity of spiritual, human and natural worlds describes Aboriginal theology. (2020). European settlement in Australia occurred less than 300 years ago. The British claimed Terra Nullius to justify invading Australia. They suggested nobody lived in Australia. In 1788 there were however, between 315,000 and 1.25 million estimated to have lived in Australia over the 65,000 years prior to British colonization, analysed Mr. Erik Paul in “Australia in the Expanding Global Crisis” (Sydney, 2020).

Australia might not have the slavery history of other countries but the effect of smallpox and massacres that reduced the ‘blackfellas’ population by 2/3rds remain incredulous. By 1920 there were only approximately 60,000 Aboriginals left. (“australian aborigine”, 2019). Attitudes should appreciate history and value blackness. People should appreciate Aboriginal struggles and recognise the effect and challenges of equality in modern day.

By 1920 there were only approximately 60,000 Aboriginals left. (“australian aborigine”, 2019). Attitudes should appreciate history and value blackness. People should appreciate Aboriginal struggles and recognise the effect and challenges of equality in modern day.

It’s ok to recognise a black coloured person is different, equality should be normative. Can current Australians truly be guilty of the sins of forebears? There is a responsibility and duty to offer fairness and equality. Close examination of modern law, the Racial Discrimination Act 1975-Section 18D “does not render unlawful anything said or done reasonably and in good faith” remains questionable. Honour and respect for Aboriginals and Torres Strait Islanders as equals and value of their history and differences is imperative. Does saying sorry and giving land (20%) in central Australia rather than prime land on the coast go far enough?

By comparison, in New Zealand, a treaty was signed outlining native inhabitant’s rights. In Australia, the Aboriginals have only been classified as humans, rather than fauna, since they have been allowed to vote for 53 years. Quite different. The Black Lives Matter movement represents an opportunity for Australians to reconsider the importance of Indigenous Aboriginals, the value of Eddie Mabo and equality of everybody including native Aboriginals and their ability to share in the Australian dream.

## SECTION 24: Operational Human Rights

Examination reveals whether human rights are integrated into a company’s operations. Human rights protection is of particular relevance where legislation is weak or non-existent. Typically, within Australia, human rights are protected as part of an employment contract.

Analysis of overseas operations and any supplier can provide opportunity for a business to use and or set standards above the legally compliant level especially in the third world where legislative protection of human rights is traditionally low.

## SECTION 25: Local Standards and Overseas Standards

Overseas, some standards and regulations are different to Australia. The market place is not able to compare apples with apples since overseas products are not necessarily exposed to the same levels of examination which in turn raises questions over the validity of some documental claims.



Organic produce classification is an example. At best, Genetically Modified (GM) food cures hunger and provides food for people at an affordable cost. At worst, it can end the natural process of crop growth due to cross contamination and create a reliance upon the GM food substitute. The Guardian newspaper in England reported that “UK Government research confirms GM crops can cross-pollinate other plants via transgenic pollution.” (“GM crops created superweed, say scientists”, 2005) IPS from the US explained “over half of growers have had grain rejected because of GMO contamination.” (“To Grow Or Not To Grow GMO Crops | Inter Press Service”, 2014).

The organic food industry provides products as a natural alternative to GM food and represents an alternative. However, the Times newspaper of India confirmed Indian organic certification is of a lesser standard and incomparable to international standards. (“Business News Live, Share Market News - Read Latest Finance News, IPO, Mutual Funds News”, 2010).

An end user has a limited way of confirming claims made by an overseas manufacturer since there is an absence of recognised assessment protocols, yet the overseas product competes within the same Australian marketplace and within an environment where local products experience higher production costs. Sometimes standards are diluted and interlinked with other measurements which themselves are potentially faulty.

## SECTION 26: Local Communities Operations

The company should avoid negative impacts upon local communities. Management of any impact is easier when it is small. The real and long term effect depends on whether any damage is reversible. Compensation is a strategy that has been employed by corporates and the CSRAA provides a yardstick to assess the true impact.

By looking at standards and good practice approaches and by assessing performance against the standards advocated by organisations such as the United Nations and the International Finance Corporation, compliance is established. A risk assessment and evaluation of emissions, water, soil and biodiversity result in companies being rewarded for performance above minimum standards. Performance is legitimised by independent test results. The Base line of zero impact is targeted. Samples and tests should be selected and analysed when necessary. Results are integrated with other CSR protocols to contribute to the overall value.

## SECTION 27: Operational Marketing and CSR Incorporation

Analysis of operational marketing examines issues that the company includes in its marketing. CSR complement the benefits of a product or service. The importance of a CSR issue relates to the size of the impact the issue has on targets; the company staff, shareholders, customers, and potential investors. The value of an issue will vary from one individual to another. Special note must be given to circumstances where additional costs are accrued by a company in order to add CSR value. The implementation of a CSR component within business operations and it's effective



marketing is well supported by the customers and potential clientele. CSR implementation within marketing is well practiced by leading overseas corporations other CSR protocols to contribute to the overall value.

## SECTION 28: Corporate Ownership Structure, Governance and Diversity

Investigating the owners of an applicant often involves examining the caliber and qualities of those in charge. The future is not always reflective of the past, but where certain practices have been accepted or were commonplace, improvements either negligible or unpursued reveal the character of the board. The opposite is also true. A management appraisal measures the influence of the board and determines the existence of a CSR supportive ideology.

## SECTION 29: After Sales Service

Corporate ethics are positively reflected when guarantees and warranties are honoured. The CSRAA examines actions in respect of replacing, repairing or refunding either the purchase price or the product or the service.



## SECTION 30: Corporate CSRAA Methodology, Regulation And Compliance

Checks and balances to ensure accurate reporting are important when assessing the existence and the level of a CSR ideology. Business operations have numerous effects which cause either positive or negative economic impacts. Each outcome and each section possesses a CSR component. The CSR aspect is evaluated and rated accordingly. Higher costs accrued by a corporate in order to behave ethically feature well.

## SECTION 31: Cleaning

Cleaning protocols vary based on individual workplace requirements. Cleaning is particularly challenging and important with the presence of the COVID virus. Best practice procedures are required at terminal cleaning locations such as incubatory isolation patient rooms and also in operation theatres but in less critical areas, lower procedure requirements are required.

In more straightforward environments with less demanding requirements, the same level of cleanliness is unrequired and high end cleaning solutions are not necessary. (This differs in the current COVID pandemic.) Barbara Connolly of the Building Services Contractors Association of Australia explains the cleaning industry is worth about AUD \$4 billion annually to the economy.

The contract cleaning industry in Australia employs in excess of 62,000 people nationally, and is serviced by corporates ranging from multimillion dollar Australian and overseas owned corporates to small family operations. A definable approach is however lacking as there are differing standards of compliance that are enforced by nationwide legislation. Compliance is governed by state. The CSRAA standards check that the correct procedures are followed and that CSR compliance is reflected.

There is a difficult balance between damage to the environment versus a failure to kill infectious agents and the damage that it may or has caused.

### SECTION 32: Staff Canteen

There are food preparation standards of compliance that are enforced by nationwide legislation. Sometimes compliance is also governed by state. The CSRAA standards analyse that the correct procedures are followed. This is a good example of an area that is well legislated and enforced by the government.

### SECTION 33: Statement on Ethical Position

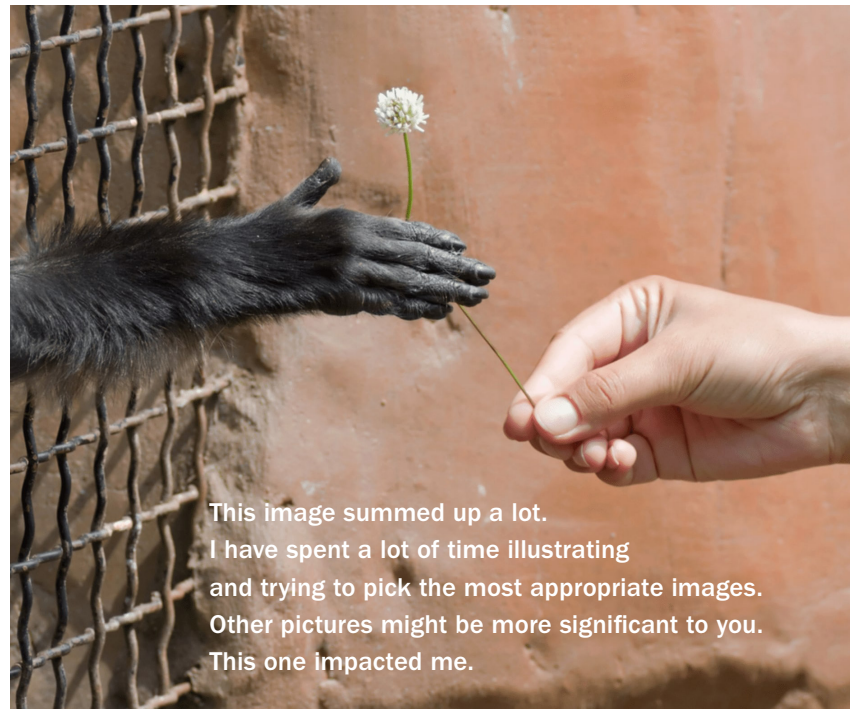
The CSRAA award reflects positively and is based on an overall ethical standpoint. The survey reveals the applicant's position on areas and issues that often do not always appear in other commentary.

There are checks and balances from the government, United Nations and International Labour Organisations to consider. The standards all vary in quality and are not necessarily finite. The CSRAA has taken the best of each organisations standards and provided an assessment structure and rationale to gauge a CSR value to complement the business. The process has been emotional.

### SECTION 34: Legal Status

The standards of compliance are enforced by nationwide legislation although some issues and their compliance is governed by state. The CSRAA standards assess whether the correct legal procedures are followed and assess whether action is comparable with external standards. The elephant in the corner is an interpretation of whether legislation is sufficient.

There is always an interpretation between legal precedents. The concept of innocence before guilt and the burden of proof. As the world gets smaller corporates are tried outside of their sphere of operation. BHP is currently fighting to avoid a legal case in the U.K. for actions in Brazil. "Change is the only constant." Heraclitus. (Mark & Mark, 2010).



This image summed up a lot. I have spent a lot of time illustrating and trying to pick the most appropriate images. Other pictures might be more significant to you. This one impacted me.



# Summary

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The answers given in the CSR survey are assessed to produce a rating of between 1 and 5 stars. 5 stars represents the highest available result. Evaluation of actions determine whether a corporate is compliant with, or exceeds Australian governmental standards. Adherence to other standards such as those presented by the United Nations or the CSRAA themselves reflect positively in an awarded rating.

Interpretation analyses many areas. All values are subjective and are weighted according to the importance the CSRAA attributes to an issue. Attention is given to adherence with government law. Determining whether legislation is stringent enough, the corporate's progress towards zero impact and the relative importance of certain areas explains much of the assessment.

The CSRAA rating provides an ethical component to compliment traditional marketing parameters. Incorporation of CSR allows corporates to market to the 77% of customers who have stated CSR is intrinsic to gaining their business. It also appeals to the 67% of staff who consider ethics integral to employment.

The CSRAA standards are constantly evolving. Feedback is welcomed and encouraged. Sometimes external engineering measurements are required to complete an application. In such case, a provisional rating is awarded. I have studied, evidenced and referenced numerous aspects from the depths of the planet caves to items within the orbit of the earth. Our future is a combination of the choices made and fortune. A decision to weaponise the virus from the caves of New Mexico, the decision to stop polluting to allow the natural equilibrium of the earth to take precedence, the luck that the COVID virus does not mutate, a recognition of the need for ethics and their implementation, the translation of the aboriginal belief that humans are occupiers with a responsibility into a dominant lifestyle, all have a bearing on the outcome and there are many other components of success.

However, currently, instead of marveling at our history and the achievements of humankind, accomplishments are overshadowed by the seemingly incredulous acceptance of a rationale that allows where we live to become uninhabitable. The reality is that this acceptance cannot continue, **change is no longer a choice but a necessity.**

A dog understands not to foul its own bed, if it does, humans recognise the time has come. Why cannot we apply that same logic to our own behaviours? Our rubbish and pollution is everywhere; from the seas to the skies to the air we breathe. The planet is dying. The path for the enlightened and informed could not be clearer.

There are more than 500,000 pieces of debris, "space junk," that orbit the Earth. They travel at speeds up to 17,500 mph, fast enough for a relatively small piece of orbital debris to damage a satellite or a spacecraft, stated NASA ("Space Debris", 2019).

Hundreds of thousands of man-made objects are zipping around our planet, from dead satellites to errant nuts and bolts explains Maya Wei – Haas, (WEI-HAAS, 2020).



In 2009, two satellites collided at 22,300 mph, the inactive Russian Cosmos 2251 and the active U.S.-based communication satellite Iridium 33, resulting in a cloud of thousands of pieces of debris that added to the space debris of more than 23,000 fragments larger than about 4 inches which gravitate around the planet earth. An estimated additional 500,000 pieces between 0.4 inches and 4 inches across, too small to track.

The collision highlights an additional problem of orbiting missiles posed by their garbage presence. 2,900 dead satellites remain in orbit adding to the more than 21,000 objects currently being tracked and catalogued by NASA. (“The Space Beyond: ‘Space junk’ numbers in the millions and could get much worse”, 2018).

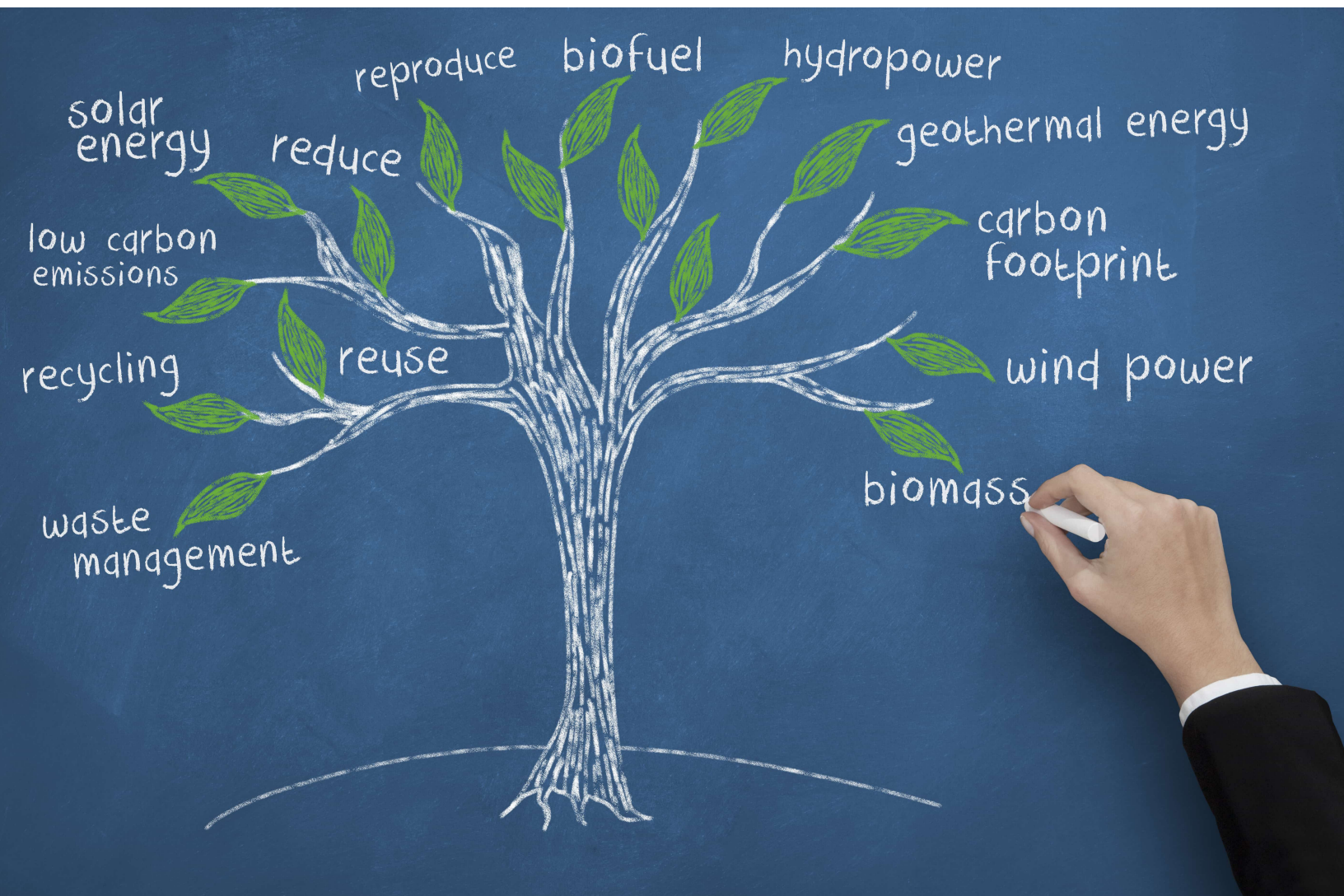
If the space garbage, emission clouds, health factors, virus potential, melting ice caps, drowning islands, reputable commentary confirmation, parental responsibility, commercialisation incentives are insufficient for change well as the old adage goes, don’t call us we’ll call you, (Kilgallen 1944).







**CSRAA**  
Corporate Social Responsibility  
Association of Australia



# The Author And Conclusion

Societal political correctness is mainstream. I consider myself mostly aware. At the age of 8 my grandmother insisted I watched Roots, I cried. I felt people surely were unable to appreciate the consequences of their actions, otherwise they would not be so full of greed and cruelty.

As an adult, I take encouragement from a Nelson Mandela quote, (“Nelson Mandela”, 2020).

**“No one is born hating another person because of the colour of his skin, or his background, or his religion. People must learn to hate, and if they can learn to hate, they can be taught to love, for love comes more naturally to the human heart than its opposite.”**

Combine this philosophy with environmental awareness and add fairness and the CSRAA was born. I enjoy surfing and laugh at the irony of life that poor balance and multiple sclerosis gives me. I am blessed with four children, most of the time, and I have a decent wife, I have to say that.

I moved from the UK to Australia in 1989 because of love, sun, the prevalence of an outside lifestyle which was less challenging year round, the quality of waves and less pollution. My turning point, was a diagnosis of gangrene received from a fin cut received at Challaborough beach in South Devon. I had heard of ‘surfers against sewerage’ but I was more interested in travel and girls. I moved to Australia. I was wooed by the cleanliness and possibility of a comfortable outside lifestyle.

I did not think about pollution for another 20 odd years when I returned to the UK. I was invited to a “secret spot” in a river mouth by a friendly local. My ears pricked up, but my enthusiasm quickly waned when he said “we go there when its good, but every time we go, we get ill, last time we went my eyes bled with puss for 3 days” I said “thanks” and politely declined.

Change is required, root and branch. I am full of admiration for those who have literally given their lives to informing us of shortfalls. I am embarrassed I have been so dormant for so long. I never expected to see a pandemic in my lifetime, I feel a responsibility to the future.

One of the many things I learnt whilst putting this altogether for you was the expression ‘Greenwashing.’ An environmental activist lady who campaigned against nuclear energy, called Jay Westerveld, in 1986, coined the term, and it stuck. Why significant? Beware the corporate that covers up transgressions with news about acts of kindness.

I have cried more times than I want to remember whilst writing this, certainly not tears of joy, rather disbelief. I have given everything I can. My children have been growing up without me. That time is lost now but I know this is worthwhile. I truly hope you support the Association because the world needs Australian support, now, more than ever. Our plan is simple, to reveal your corporate identity so you better connect with your staff and customers.

Chris Pakham talked about being the voice of nature that can’t talk for themselves. He sympathised with those out of work because of the words current plight. He understands people “wanting a return to the old ways and the chance to start earning an income again.” (“BBC World Service - HARDtalk, Chris Packham: ‘Finding the good in the bad’ of Covid- 19”, 2020). Rethinking our actions might be a new dawn for mankind.

I would like to leave you pondering a version of a famous Bill Shankly quote,

**“Some people think football extinction is a matter of life and death. I don’t like that attitude. I can assure them it is much more serious than that”.**

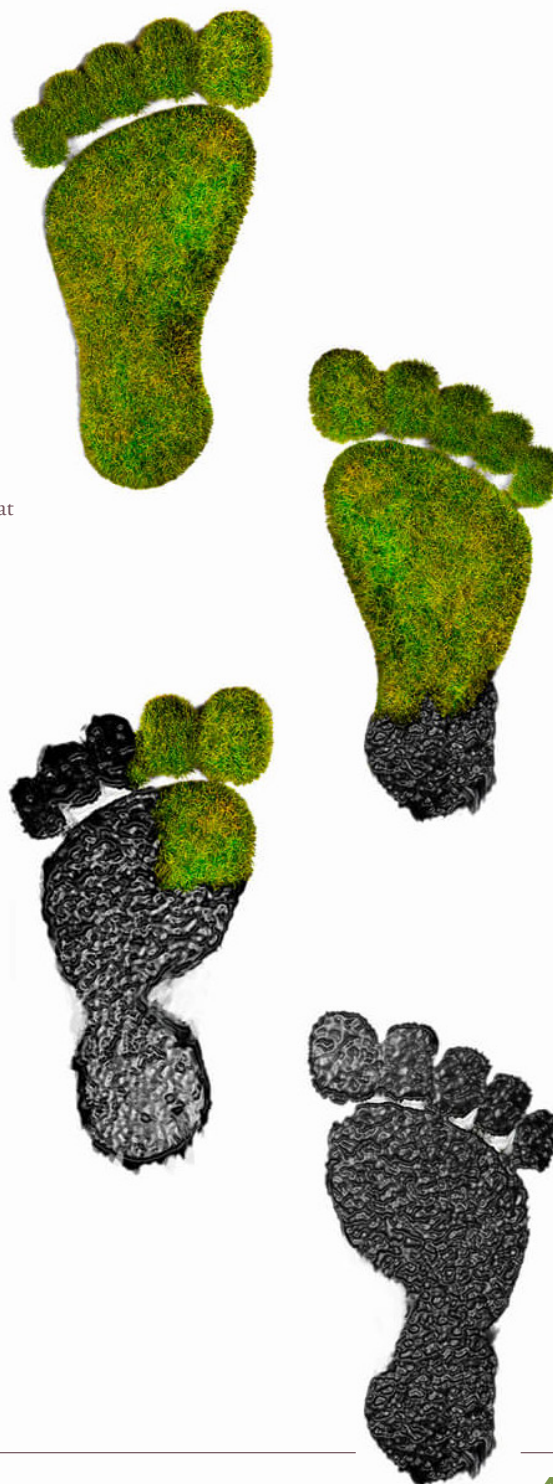
Anything newsworthy will be added to the website. As I have been writing I have become desensitised. There is only so many times you can shake your head in disbelief, cry or not acquire affirmation from the children around you. This did catch my eye whilst I was finalizing this and it is a poignant finishing point. Unless we act now the future will become like the Greenland ice sheet, past the point of no return.

Feel free to research the references for yourself.

Remember why you are here, to create a decent CSR rating that improves your sales and communicates ethical decency. I sincerely hope we can be proud that we are doing something together.

“The Greenland Ice Sheet is losing mass at accelerated rates in the 21st century, making it the largest single contributor to rising sea levels. The potential for future change is uncertain. The research combines more than three decades of full ice sheet analysis. There is a retreat of glacier fronts, with a consistent speedup of 4–5% per km of retreat across the ice sheet to a new dynamic state of sustained mass loss that would persist even under a decline in surface melt. (Howat et al., 2020).

**Congratulations for initiating positive changes.**





# Appendix

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- 2.7 million tonnes of plastic a year, more than 1 million seabirds and 100,000 marine animals die from plastic pollution every year. 100% of baby sea turtles have plastic in their stomachs.
- There is now 5.25 trillion macro and micro pieces of plastic in our ocean & 46,000 pieces in every square mile of ocean, weighing up to 269,000 tonnes.
- Every day around 8 million pieces of plastic makes their way into our oceans.
- The Great Pacific Garbage Patch is around 1.6 million square kilometers – bigger than Texas.
- The world produces 381 million tonnes in plastic waste yearly – this is set to double by 2034.
- 88% of the sea's surface is polluted by plastic waste.
- Between 8 to 14 million tonnes of rubbish enter our ocean every year.
- More than 1 million plastic bags end up in the trash every minute. The world uses over 500 billion plastic bags a year.
- By 2020 the number of plastics in the sea will be higher than the number of fish.
- 1 in 3 fish caught for human consumption contains plastic.
- The entire Great Pacific Garbage Patch is bounded by the North Pacific Subtropical Gyre. The National Oceanic and Atmospheric Administration (NOAA) defines a gyre as a large system of swirling ocean currents.
- The North Pacific Subtropical Gyre is formed by four currents rotating clockwise around an area of 20 million square kilometers: the California current, the North Equatorial current, the Kuroshio current, and the North Pacific current.
- The area in the center of a gyre tends to be very calm and stable. The circular motion of the gyre draws debris into this stable center, where it becomes trapped.

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