Submission

Climate Change in Western Australia Issues Paper September 2019

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The submitter has just completed a twelve-year term as an elected member with the City of Fremantle, where he was actively involved in the Council's achievements in *Climate Change Abatement, Adaptation and Advocacy*. During his time on Council he was Council's representative on *WALGA Zone* and Committees and the Local Government Deputy WAPC member.

In 2012 he was awarded a Masters in Sustainability Studies from Curtin University Perth. He keeps up his association with Curtin University current by giving occasional presentations to students, especially visiting overseas students.

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Acknowledgments

The author pays respects to Wadjuk Noongar Elders past and present and acknowledges their continuing custodianship of country and culture.

The author thanks the Government of Western Australia, and Minister Dawson for the opportunity to make a submission on such a crucial issue for our State's future success.

Format

In the interests of legibility, this submission follows the same topics, in the same order as presented in the *Issues Paper.*

Contents

"Climate Emergency declared by 11,000 Scientists who warn of Catastrophic threat to humanity" [1]

Executive Summary

There is a global Climate Emergency[2] and action is urgently required to mitigate the carbon emissions of preceding generations. Australia's population has some of the highest per-capita emissions in the world. Australia has a moral and ethical responsibility to reduce emissions to a level consistent with a pro-rata level to keep net warming to less than 2^{o} Celsius (Paris Commitment). In addition Australia as a developed country ought assume a role of leadership in reducing emissions.

The Australian community is now finding a strong voice with regards to climate change with groups such as the School Strikers[3] and Extinction Rebellion[4]; these are across the generations with school children and grandparents joining forces. Unfortunately Australia's Federal Government is absent in this most crucial action. Without Federal policy and support there is a greater responsibility on other tiers of Government to act. Local Governments have traditionally worked hard in this field, so it is now with optimism I lodge this submission, in the confidence we can expect an assertive response from the Western Australian State Government.

The eleven sections of the Discussion Paper (and therefore this submission) cover a broad range of issues as is appropriate. All sections present multidimensional issues none of which can be addressed with a silver bullet. They all require *co-operation* between State Government, Local Government, Community and the Business Sector. While the State has the ability to change the way we use power and transport or deal with our waste, there also needs to be support for change from the community and business, this support will need to be hard won.

A consistent theme in the submission is the need to broaden the State's financial base, from almost total reliance on mining and mineral exports to an economy that embraces a renewed manufacturing sector, and value-adding to the oil, gas and minerals we export. In regards to the burgeoning Liquid Natural Gas (LNG) industry, the State must temper the headlong rush into exporting LNG, seemingly at all costs. These resources should be considered an asset for **generations to come;** indeed there is a moral and ethical component to the present generation exploiting these resources at the current rate. Also 'squandering the minerals for the quickest present day sale' results in unacceptably high fugitive emissions to the environment. These are two legacies no generation should be passing onto our children and to future generations.

Much of the technology required for updating the State's aging power generation and distribution capacity, transport options, waste services and water supply already exists. With Government support for renewal many of these technologies can be brought to market,

initially for domestic use, but ultimately to develop new markets interstate and overseas for Western Australian businesses and innovators.

Climate change is impacting heavily on the rural sector across Australia. Western Australia has some very important overseas markets for farmed products. Unfortunately the rural communities are in decline. Support needs to be provided for rural communities if our agricultural sector is to remain resilient.

Western Australia is blessed with remarkable renewable energy options. It is hoped this discussion paper can be a part of a pathway to Western Australia becoming a strong force in the supply and distribution of renewable energy and relevant technologies.

1. Transforming Energy Generation

Energy generation in Australia is at a precipice; with much of the supply being delivered by privately owned aging coal power stations. There is no cohesive Federal Plan or Policy to guide investment in the energy sector into the future.

However, in Western Australia we are in a better situation due to the South West Interconnected System (SWIS) and Horizon Energy being effectively Government owned and operated. This offers a window of opportunity to confront the very real challenges facing the power industry, both in supply and consumption. If Western Australia is to realise meaningful reductions in our Green House Gas (GHG) emissions significant changes in mindset are required, before technological benefits can be capitalised on.

'Base-load' Power provided by large generating stations served the power industry and community well throughout the last century. However, recent rapid adoption of renewables renders that supply model obsolete. The grid has excess capacity at night due to reduced demand and lack of ability to 'turn down' the generating capacity of these obsolete large power stations. Policymakers need to consider that primary supplies to the grid will be/need to be from renewables. At times when demand outstrips supply a nimble capability response is required from energy storage devices; such as pumped hydro and batteries. Dams traditionally used for drinking water can be converted to pumped hydro; they have the capacity, and pipework in place. Any shortfall can be addressed with quick-start rotating generation, initially small scale distributed gas turbines.

Supply Management has been the catchcry of the base-load style power industry. Having capacity to supply the highest demand the grid would ever experience, even if only for a period of a few hours a year, has resulted in the SWIS experiencing gross over-capacity much

of the time. This over-capacity comes at a very real cost to the utility and its customers. It is now time to take demand management seriously.

Demand Management can be achieved at corporate high consumption user level, through contracts that encourage load shedding in times of high demand. At the domestic level, smart appliances have been available globally for quite some time now, but not as much in Australia, because their benefits cannot yet be realised. There needs to be a standard set for **Smart Appliances** so consumers can be confident they will be able to use them to full advantage. As already mentioned, whilst *Smart Power*[5] is available in Western Australia it has not been marketed well.

City of Fremantle Corporate Energy Plan[6] outlines how the City intends to become *Carbon Neutral* by 2025. This document has excellent lessons for other Local Governments and Corporate Australia alike. One initiative, which would require State Government assistance, is changing the rules on **Contestable Power.** Currently an organisation that operates from a variety of sites can access contestable power on those sites that reach the demand trigger, however, other sites that do not reach the trigger cannot avail themselves of contestable power and are obliged to purchase power through Western Power/Synergy. If the rules were changed to allow an organisation to 'bundle' their power consumption into one account they could access contestable power across their organisation. Furthermore that contestable power could be affordable renewable energy sourced from one power retailer.

The situation in Western Australia regarding **Street Lighting** is sub-optimal. I refer the reader to the submission from WALGA for more details on this issue.

Responses to questions in Discussions Paper:

- The main challenges to decarbonising Western Australia's power system are out-dated thinking regarding the very basis of power supply that continues to see 'base load' as the only model.
- Effective ways to overcome these challenges are to replace base-load technology with *renewables backed up by storage, augmented by small-scale rapid response rotating generation in the form of gas turbines for times of excessive demand*.
- All sectors should make pro-rata contributions to Australia's GHG emissions reductions to be consistent with the Paris Agreement[7]. Power generation is, in fact, well placed to make greater contributions to emission reduction due to the rapidly changing technology available to the sector.
- Transition to a low carbon/zero carbon future should be seen as a matter of **urgency.** Alas this would probably not be feasible without a comprehensive Australia wide (Federal) emissions/energy policy.

2. Industry Innovation

The success of Western Australia's resources industries has been at a cost to many manufacturing ventures unable to compete with the 'buying power' of the big resource groups. The cost of wages, materials and contracts are at such a level that only the resource industries can compete in this marketplace. Such *concentration of trade* leaves our State vulnerable to the shifting fortunes of the extractive industries. Consideration ought be given to using a portion of royalties from resource extraction to create a *future fund* that can assist manufacturing industries and promote *value adding* to what is extracted. This would give Western Australia a broader income base and consequently resilience in volatile global markets. Furthermore shipping used in exporting bulk raw materials, is very carbon and Sulphur[8] Intensive.

Whilst I have little experience of LNG exports, the current state of play regarding fugitive emissions is clearly unacceptable. For one industry to create an exponential rise in carbon emission, so that it contributes *over half* the States emissions, whilst also being responsible for *more than half* of Australia's *emissions increase* should ring alarm bells. The LNG sector's future should be in jeopardy until they can demonstrate the feasibility of the industries commitment to *carbon capture and storage* and demonstrate a significant reduction in their carbon emissions.

From experience in the iron ore sector, remote mines and camps rely almost solely on *diesel reciprocating engines* for power generation, despite their remote site locations being more suited to affordable renewable generation. Diesel used on mine sites is heavily carbon intensive through both its use to generate power *and* its transportation by truck for thousands of kilometres. These circumstances also render diesel power subject to breaks in supply if trucks fail to get through. Renewable power with battery back up is more dependable, and can promote research and development of that power delivery type which will be useful in other *edge of grid* circumstances.

Solar generated hydrogen and lithium-ion batteries are opportunities that should be capitalised on in WA for future industries, any up-front investment will be repaid in both sales and broadening the States income base. We are seeing predictions that Western Australia could be the renewable centre of South East Asia, both in supply of equipment and supply of power, this ought be included in medium to long term budgeting. Within the greater Metropolitan area synergies between industries ought be identified and capitalised on.

Examples; Industries that require *product cooling* can be located adjacent to industries requiring heating; so *heat-energy* can be swapped. Similar examples in the *water cycle* of industries should also be examined**.**

Current debate on a *Hydrogen future* for Western Australia has already become a catch cry for the fossil fuel lobby, *renewable hydrogen* is an exciting future option. Best research and development (R&D) will be to develop renewable hydrogen *pilot plants* that should lead to technology *scale-up* in the medium term. Lack of investment now will see Australia once again playing catch up in the future.

Responses to questions in Discussions Paper

- The *City of Fremantle* has committed to being carbon neutral by 2025, and has developed a Corporate Energy Plan to achieve that aim.
- The barriers to *decoupling* energy and emissions in the resources sector relate to the boom-bust or power-on power-off nature of the sector. *Value adding* to the mined product would smooth those cycles and encourage more sustainable energy research and development.
- The Government of Western Australia can foster clean industries and technologies by developing a *future fund* to invest in such technologies. Committing a portion of mining royalties can finance the fund.

3. Future Mobility

Like Energy, the transport sector has changed little over the last 50 years. The majority of personal transport is still via private cars, with reciprocating engines, while freight is predominantly transported with trucks also using reciprocating engines. Technology is well advanced to foster both *low carbon transit and transport*, but there appears a lack of enthusiasm to make the necessary change.

Perth is now of a size that can transform from a *hub-and-spoke* city, with all roads leading to Perth CBD to a more *distributed city* with strong secondary centres such as Fremantle providing good work, play, study and live options, with trips into Perth CBD on an occasional basis.

With regards to private transport a *change mindset* is required, picking up a bike helmet and *Smartrider* has to become the choice over picking up car keys. A significant contributing factor is our urban sprawl; Perth can no longer continue feeding the *project home industry* with land to build low density project homes in locations with no work, schools, services or community spirit on the false premise of affordability. Homes on the fringes are very expensive in terms of transport and social isolation costs. Constructing rail to the outer suburbs just consolidates that urban sprawl. We ought now consider *single occupant car commuter trips* as inappropriate. These choke up the road networks promoting construction of more and larger road works, as well as blighting our urban centres with car parks. The cost of using a private

car to commute ought include a surcharge both to dissuade the practice and to part fund better future transit infrastructure.

Emerging technologies will provide good transit options, currently trackless trams[9] are proving popular, but others will emerge to suit demands.

Freight logistics provide their own challenges; however there ought be consideration of alternative modes. The commitment to reopen some grain freight lines is a good way to get hundreds of trucks off our roads. Alas the Tier 3 lines have been left out of this move. Likewise achieving bio-security certification for Port Hedland opens up maritime (*Blue Highway*) freight to regional areas, removing many trucks off the roads.

Shipment of produce from farm to distribution centres, sometimes in the Eastern States, then back to Perth based distribution centres, then to shops is a practice that sees produce accrue an inordinate number of *carbon miles*. Local sorting packaging and distribution ought be supported, which will create local jobs, fresher produce *and* reduce carbon emissions.

For freight logistics that require long distance haulage vehicles using alternative fuels should be developed. Hydrogen is one example waiting to be brought to market. Local truck use can transition to electric vehicles as exampled by some Local Governments choosing electric garbage trucks. Not only will this reduce green house gasses, it will also make our city healthier in terms of reduced air and noise pollution.

Responses to questions in Discussions Paper

- The barriers to purchasing low emission vehicles are predominantly lack of choice and high up front cost. A local electric vehicle industry would be an ideal solution.
- Uptake of electric vehicles would be greater with more choice and lower costs. This would require a critical mass of demand that could be stimulated by a commitment from all tiers of government to commit to using low emission vehicles in their fleets.
- Encouraging healthy and public transport uptake will need to overcome the commitment many people have to their cars. The car industry spends vast amounts on advertising to keep people *dependent*. That has to be offset with a message that driving cars, especially for single person trips is socially unacceptable, in the same way smoking was made socially unacceptable.
- The important issue is, however, not about being left behind in the transition to cleaner transportation, it is about the urgency required to address climate change/carbon and other greenhouse gas emissions.

4. Regional Prosperity

This is not a topic the author has expertise in, however an initiative to sequester huge amounts of carbon in the South East of the state is encouraging news. I understand this project is based on species planting and soil morphology. Such projects could also create employment and economic development in the regions.

Western Australian wheat is considered high quality globally, with some strains being supplied to South East Asia for the production of noodles. Climate change is impacting on the viability of the *wheat belt,* not only the direct issues of a drying climate, but also the impacts of native and feral animals moving into the wheat belt in search of food and water.
Planning mechanisms ought be introduced that reduce urban sprawl that otherwise takes up areas used for market gardens and subsequent supply of fresh produce to Perth.

Responses to questions in Discussions Paper

The demise of rural areas is a vexing issue. It seems that without tourism many of our rural communities are in decline, loosing services city dwellers take for granted. The Collie Future Fund is an example of how Government can help struggling rural areas.

Historically inappropriate farming practices, which have lead to, increased salinity and *biodiversity loss* need to be turned around. There is need for more research in this area to foster change in farming practices.

A reduction in the *consumption of red meat* is a global essential in reducing carbon and methane emissions, which has the potential for further negative economic impact on regional Western Australia. Long-term strategies need to be developed to facilitate such essential change.

5. Waste Reduction

As a former Councillor with *the City of Fremantle* I have been confronted with issues of waste and recycling management every day. The single most important issue is to change from a linear to a circular economy. As an example of poor practices, crushing glass to be used in road-base is a bad form of *down cycling*; far better to facilitate a glass plant in Western Australia. There must be viable, and preferably local uses, for recyclables collected from the verge, or communities will be rightly cynical about the benefits of recycling and not put in the effort to separate their waste.

Unfortunately the relative wealth of Western Australians has fostered a throw away mentality. This coupled with a plethora of inappropriate packaging has resulted in significant

waste problems for the State. Pre-packaged food has made shopping more convenient, however it comes at a great cost. There is a lack of variety in package sizes, resulting in smaller households having to buy more than they need, and throwing away the *excess*, plus the packages that seem so convenient are too often plastic based and end up in inappropriate locations.

Consumer goods require long awaited *Extended Product Responsibility* (EPR) legislation. We are seeing changes in areas such *as Container Deposit schemes*, but there still needs to be more emphasis on electronic and white goods. There is currently little incentive for the importers and manufacturers to design their products to last longer and be recycled at the end of their lives. A comprehensive review of consumer legislation is required to ensure the buying public gets a product that is well made, ethically made, consumes minimum power when used and is readily *down cycled* at the end of is working life, is overdue. When Choice Magazine nominate their (worst) product of the year as being a fridge sold by Ikea that is incapable of maintaining the set temperature and uses more power than advertised, we should take that as a wake up call that things are not satisfactory in the appliance sale industry.

The *Landfill Levy* ought be dedicated to making necessary significant changes in how we manage our waste stream, and ought *not* be split between waste management *and* general revenue.

Responses to questions in Discussions Paper

Whilst inappropriate waste disposal can increase green house gasses through the generation of methane, it can also generate other environmental pollution, especially plastic, which often ends up in the world's oceans. Solutions to addressing waste problems should focus on waste holistically not just green house gas emissions.

The Community, Business and Government can do many things to reduce waste generation and therefore resource wastage. Offices should aspire to being paperless, disposable coffee cups and food containers should be a thing of the past and plastic wrap should not be the default product for selling produce in. For consumers, thinking before they buy is a crucial action. Ask, do I need this product I am considering buying? Can I buy a smaller quantity and is it available unwrapped? What are the embedded transport emissions and can I buy locally sourced products. This information should be provided on product labelling to assist the consumer.

6. Safe and Healthy Communities

Climate change is having severe impacts globally; increases in intensities of drought, heatwaves and fires create news stories almost daily. These disasters are often reported in terms of financial or trade impacts, however the longer lasting implications run much deeper than monetary loss. These *'natural'* disasters destroy the lives of families, and sometimes-whole communities. Regional towns and communities in Western Australia are becoming less sustainable, loosing local businesses and essential services; climate change is accelerating this rural decline.

Of all the issues in this submission, *Safe and Healthy Communities* is the one issue that is reliant on *carbon abatement* to mitigate. To think Western Australia can adapt to climate change disasters paints a very dire prediction for the future of the State. Yes, work needs to be done to give emergency services the resilience they require to respond to increased threats, but that should never be as an alternative to real *carbon emission abatement*.
A happy and healthy community is one of the strongest indicators of success of all tiers of government. Western Australia currently has many in the community protesting against inaction on Climate Change, Government must take this indicator very seriously.

Responses to questions in Discussions Paper

As an urban dweller I am fortunate to be protected against some of the worst aspects of climate change. Beach erosion, extended heatwaves and even lack of water can be addressed with 'technical' solutions, of greatest consequence is global issues such as food security, conflict over water rights and climate refugees. Whilst these issues are of global consequence, they promise to be greater threats to my community than important local issues.

Western Australia's health services need to be vigilant and prepared for vector, water and food borne infectious diseases, as well as air pollution patterns. The risks could be from a variety of sources, ranging from mosquito born diseases, to heat stress and asthma related to smoke and pollens.

Without long term strategic planning Western Australia's predicted future climate threatens the viability of agriculture and aquaculture to support our communities. This risks the State increasing reliance on exporting minerals and gas. Such a monoculture risks a less diverse community, and stranded asset risk.

Investment in diversification of industry is urgently required. With all the renewable resources available to us, Western Australia has the potential to be a powerhouse of *Renewable Energy and Technology.*

7. Water Security

One of the major impediments to Perth's resilient future is water security. There is a strong irony that for a State with a Capital city in an area of failing rainfall and water scarcity we continue to be so irresponsible with water usage. The very nature of domestic water tariffs *reinforces* wastage. Desalination is appropriate as a transition to a more *sustainable water* future, but should not be seen as a *viable long-term* option.

On a personal level our last household Water Account showed usage of *6kl for the period, or 90 litres per day.* This is for 2+ people in a conventional home with all the normal appliances and well-kept garden. For this I was charged $5.48, but also $145 for being connected to the system. For Western Australia to respond to the increasing shortage of water the whole billing system needs to be redesigned. We need *a 3-tier Billing system* that encourages domestic users to consider that using *over* 427kl (the 3rd tier trigger) over a 2-month period as acceptable is *not* reflective of our water security situation at all. The above seems to suggest it is *acceptable* by our society for a household to use in the range of **100 times** our family consumption- clearly it is acceptable. A billing system with a much reduces connection charge, that includes a modest *free* amount of water would be more socially equitable. The cost burden would then shift to significant increases in consumption costs as consumption increases. This would offer a much greater incentive for households to take reducing their water consumption seriously.

The Gnangara and Yarragadee aquafers contain vast amounts of water, but has taken *millennia* to accumulate. Careful management and recharge is required if these resources are to continue to be able to be exploited by future generations of Western Australians.

Responses to questions in Discussions Paper

Change is urgently needed in the way *reticulated water* is charged for. In regards to domestic reticulated water, the *fixed* charge needs to be reduces and the *tiered* consumption charges increased, with a much steeper price increase across the three tiers. Improved monitoring and metering of shallow bores into the Leederville aquifer are required. Whilst this resource depletes it not only compromises one of the community water sources, it also adversely impacts on our ecosystem through starving wetlands of water.

Water security for the agricultural sector is a vexing issue. The agricultural sector is very valuable to Western Australia, it provides high value products for domestic and export markets. Western Australian speciality wheat is crucial in diversifying the State's economy. *The sector is only one big drought away from disaster, as we have seen in NSW and Queensland*. Work needed to improve resilience to this sector is clearly required as a matter of urgency. Those with expertise in provision of, and use of agricultural water are better placed to create policies for the sector.

8. Liveable Towns and Cities

The liveability, sustainability and resiliency of our cities is crucial to community wellbeing. Perth should aspire to rating highly in the Economist Intelligence Unit's (EIU) *Liveable city Index*, not only for international credibility, but also to ensure the best environment for Perth's community to thrive. Good *town planning* is crucial to the liveability and resilience of our towns and cities. Good cities do not just happen, and especially if large project home developers continue to drive the market through urban sprawl. *Directions 2031* articulates aspirations to encourage densification of Perth's inner suburbs, but with a few exceptions this has not been successfully achieved. In the author's experience, there are constraints to liberating *brownfield densification* relating to the provision of services, especially where there are limited numbers of lots often held in different ownership. The State government agencies need to co-fund water, sewerage and power connection upgrades where existing ones do not have the capacity to service medium density living. Densification adjacent to rail stations is crucial a successful example is Claremont.

Perth (as with other cities) needs to be designed for the changing climate. Tools such as heat mapping need to be used to maximise the resilience of the city. Many Councils are now working towards including *urban forest* principles into their work and this is adding to the liveability of those areas. When integrated into *the urban design* urban forests and *green links* also improve the habitats of flora and fauna resulting in improved amenity and wellbeing for the community.

Large areas of hard surfaces, such as carparks and roads exacerbate the *Urban Heat Island Effect*. Temptations for Governments to constantly increase road-building efforts as the networks reach capacity must be resisted. Far more appropriate employment options can be derived from *Nation building projects* such as Transit (tram, rail and cycleways) and Renewable energy.

Responses to questions in Discussions Paper

If Perth is to improve the energy efficiency of the built environment many different levers must be employed. The very design of the city, especially suburban areas needs to respond to both climate and transport imperatives. The current trend for large project homes on small blocks in big development areas far from work, education and recreation must change. *The bar* on sustainable design must be set much higher. The increase in initial cost of sustainably designed built form pays many dividends in terms of liveability, costs to run and resale value of these homes during their *life cycle*. Building codes must be tailored to facilitate such change.

When property is bought and sold there are many disclosures required of the seller. One of these should be the energy rating/usage of the property, this would create an incentive to build or renovate to higher standards, and an incentive to buy at a higher standard.

Sustainability triggers in areas with *split density* codes are a simple way of achieving better-built form outcomes. The adoption of the, recently awarded, *Fremantle Alternative* planning guidelines across the Metropolitan area would encourage deep root plantings on *private land,* and State sponsored *Urban Forest Strategies* would improve *reserved land* tree cover. Updating of the Planning system and RD Codes must move from the old model, that has promoted achieving the largest number of dwellings and floor plate size, to a model that promotes truly sustainable design, through the use of both *carrots and sticks*.

9. Resilient Infrastructure and Businesses

The recently released *Financial Review*[10] research on the resilience of Countries rated Australia as a *Dumb Economy*. This was primarily based on Australia's reliance on *mineral exports as the key driver of the economy,* with insufficient balances from other industries, especially manufacturing and technology export. There is a need for support to encourage real *business diversity.* Establishing a *Tech-Hub* in a vibrant centre, such as Fremantle is one step forward. Support for ideas and concepts for new industries that have the potential to spread our commercial and industrial base should be forthcoming. Education is an example of searching out and securing a new export commodity, but this needs careful management as adverse reports coming out of some Universities has the potential to undermine the benefits of this initiative.
As well as seeking new industries to market, Western Australia is poised to capitalise of new markets as affluence in some South East Asian countries increases. As Western Australia should not rely on limited products and service to sell, it also needs to have as diversified markets as possible. That way when the ravages caused by *Global Warming* hit, the commercial base will be resilient enough to survive.

The State's legal framework must encompass legislation that clearly nominates the responsibilities of *Authorising bodies, Landowners and Users* of the subject land in the event of disaster resulting from the impacts of climate change. In the event of disaster our communities must be focused on recovery, not apportioning blame.
As climate related disasters impact key infrastructure, they can be compromised for extended periods, be it power in north west America due to fires, power in South Australia due to storm damage to transmission lines, Major road damage due to flooding, or one of many other disaster related impacts on infrastructure. Physical infrastructure must be designed with alternative provisions that can be initiated in times of emergency. Diversification of power, water, sewerage services and alternative transport routes are cases in point.

Responses to questions in Discussions Paper

Primary Industries are specifically vulnerable to the effects of climate change, when tragedies happen it not only affects farmers and their families the whole community suffers. Rural towns are particularly fragile and need support to get through the problems. The State also needs to support research into the effects of climate change on specific primary industries and assist farmer's transition to less vulnerable crops including carbon farming.

Best practice for resiliency in public and private infrastructure is to acknowledge and research *anticipated impacts of climate change and take measures to avert those impacts*. It is also essential for Australia to be a leader in *carbon abatement, and adaptive industries*.

10. Protecting Biodiversity

Perth is located on a *Biodiversity Hot Spot*, yet there is little evidence of this due to business as usual urban sprawl, wholesale tree and groundcover removal on development sites are something all Western Australian's should be ashamed of.
Native flora and fauna face a *triple threat from climate change, introduced species and land clearing*. These things are occurring faster than species can adapt to, putting them at *increased rick of extinction*. The community is becoming increasingly aware of species extinction issue, with many supporting action groups such as *Extinction Rebellion* (XR) whose members and supporters are increasingly made up of conservative mums, dads, grandparents, doctors, teachers, farmers, fire-fighters and lawyers and even priests and Buddhist nuns.

It is now time to give something back to nature, as westerners we have taken everything we can, and in 3 generations have fostered one of the *highest extinction rates* in the world. Historical evidence shows that Indigenous people and communities have lived with the land for thousands of years, with little or no damage. We have to seek help from indigenous people and work together to heal our land.

Responses to questions in Discussions Paper

The very way we consider using the land needs reassessment. Every land use decision, from suburban lots to mine-sites needs strategies for supporting native flora and fauna. Including habitats for native species must be *second nature*. Offsets are inappropriate methods that *allow* environmental damage. If a land-use ceases, be that agricultural, mining or residential, the user ought be obliged to *rehabilitate the land* back to its original state.

11. Strengthening Adaptive Capacity

The planetary system is now in a *Climate Emergency*; even if all GHG emissions were *abated* tomorrow the effects of the increased atmospheric carbon and other related pollutants would remain active for many generations. *Adaptation cannot be seen as an alternative for abatement, but is now an essential action for the future.* As with other emergencies, adaptation has to be well coordinated, evidence based and free from political influences.

Western Australia is *a city based* society, when the effects of climate change strike us it is all too easy to push a button to address the issues, but the very action of pushing that button probably *exacerbates* global warming, *the best form of adaptation is abatement*. However as a society we have reached a point where we *now must consider adaptation*, we are lucky to have that option, because people living on low-lying Pacific islands have no options.

An effective appropriate adaptation response relies on *good information and good policies to use that information.* Actions must be organised at a citywide level and Local Governments are undertaking significant work on these matters. A coordinated effort is required to ensure the actions of one authority do not adversely affect another.

This is where effective leadership enables the change needed to meet the challenges that confront our communities

Responses to questions in Discussions Paper

An effective adaptation response for Western Australians will only work if there is a coordinated statewide effort. There is currently a shortage of well-funded leadership in this space. Councils, businesses and individuals are holding back to see what happens, instead of working together on evidence based actions. This is where effective leadership enables the change needed to meet the challenges that confront our communities.

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