Keep Australia Beautiful®

DISPOSAL OF END-OF-LIFE TYRES

STAKEHOLDER SURVEY (AUGUST 2020)

Summary of Results

Keep Australia Beautiful National Association Ltd
ABN 35 743 600 611
Level 1, 268 King St
Newtown, NSW 2042
T: 02 8594 4077
E: admin@kab.org.au
W: www.kab.org.au

TABLE OF CONTENTS

PURPOSE

The purpose of the survey was to find out what Australians think about the disposal of old tyres, or more precisely end-of-life tyres when they can no longer be re-treaded and re-used and to use this information as a basis for measuring the level of consumer concern for the issue. Other aspects assessed included public knowledge and understanding of the tyre recycling levy, awareness of recycling processes, and opinions on the most sustainable recycling processes.

SURVEY METHODOLOGY

The survey was distributed by email on 31 July 2020 and closed on 17 August 2020, giving respondents three weeks to complete it online. The survey was distributed to 6,624 recipients and there were 381 responses, a response rate of 5.8%.

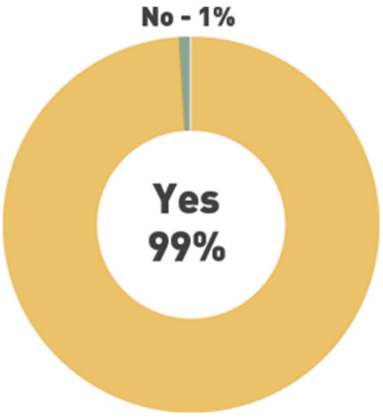
As of 31 Jan 2020 there were 19.8M registered motor vehicles in Australia {Australian Bureau of Statistics 2020, https://www.abs.gov.au/ausstats/abs@.nsf/mf/9309.0). With a confidence level of 95% and a margin of error of 5%, using the ABS sample size calculator (https://www.abs.gov.au/websitedbs/D3310114.nsf/home/Sample+Size+Calculator) the optimum survey sample size is calculated to be 385.

From the demographics data collated, the respondents represent a broad cross-section of the population in terms of gender, employment, education, and household income with a high proportion on responses received from individuals in NSW. This is likely due to there being a significantly higher proportion of contacts within NSW on the Keep Australia Beautiful database. Keep Australia Beautiful also made efforts to limit the number of recipients with detailed knowledge of recycling policy and systems, to avoid influencing results.

SURVEY RESULTS

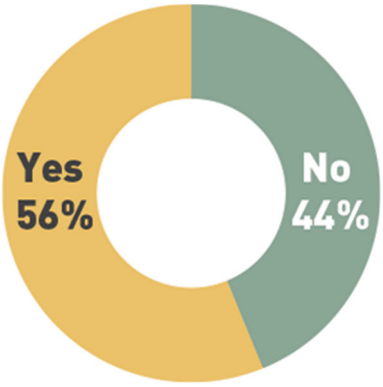
1) Do you think disposing of old vehicle tyres is a world-wide environmental problem?

Almost all respondents agree that disposal of end-of-life tyres is a world-wide environmental problem.



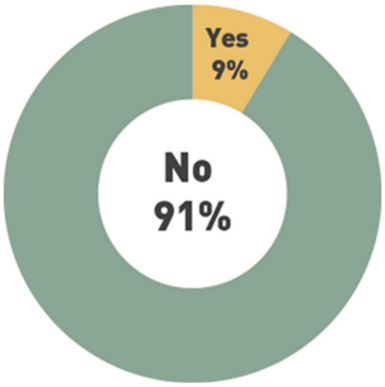
2) As a customer buying new tyres, you are charged a recycling fee by the retailer for your old tyres. Do you think the retailer does recycle your tyres?

Just over half of the respondents believe that tyre retailers are actually recycling their tyres.



3) When you leave your old tyres with the retailer. Do you know how they are recycled?

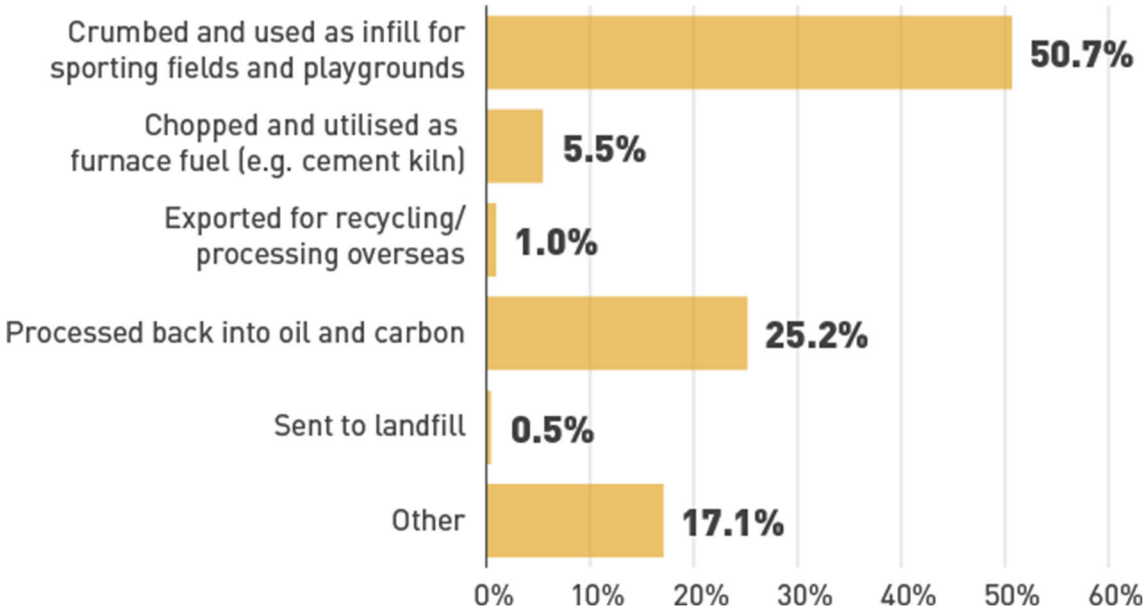
The majority of respondents are unaware of how tyres are recycled.



4) From the processes below, select the one you consider to be the most responsible

- Crumbed and used as infill for sporting fields and playgrounds
- Chopped and utilised as furnace fuel (e.g. cement kiln)
- Exported for recycling/processing overseas
- Processed back into oil and carbon
- Sent to landfill
- Other - Write In

To avoid response bias, the answers to this question were set on random rotation.



See Appendix 2 for a list of responses provided under "Other- Write In".

Notably of the "Other" responses, almost one-third indicated that end-of-life tyres should be processed for use in roads.

5) Briefly explain your choice for the above question

See Appendix 3 for the full list of responses provided in response to this question.

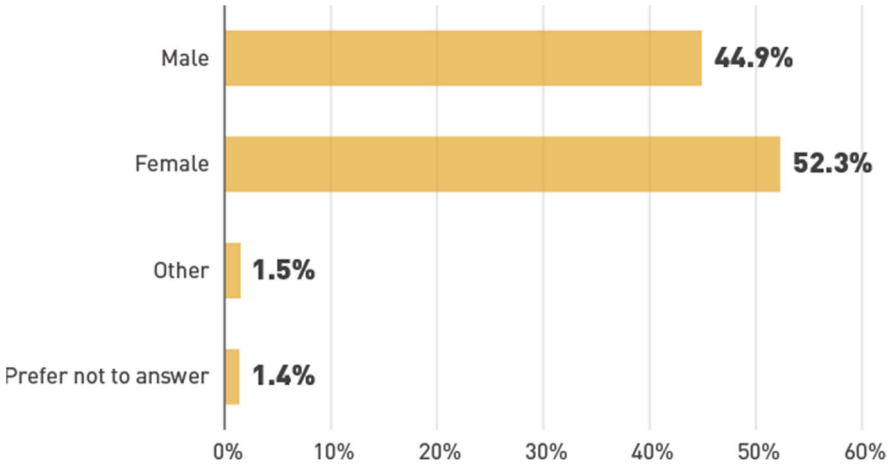
The responses indicate there is a definite preference for environmentally responsible or "closed loop" solutions for managing end-of-life tyres.

Most comments expressed a sentiment that Australia should take responsibility of its waste materials locally and avoid exporting the problem as well as the additional resources required to transport them offshore.

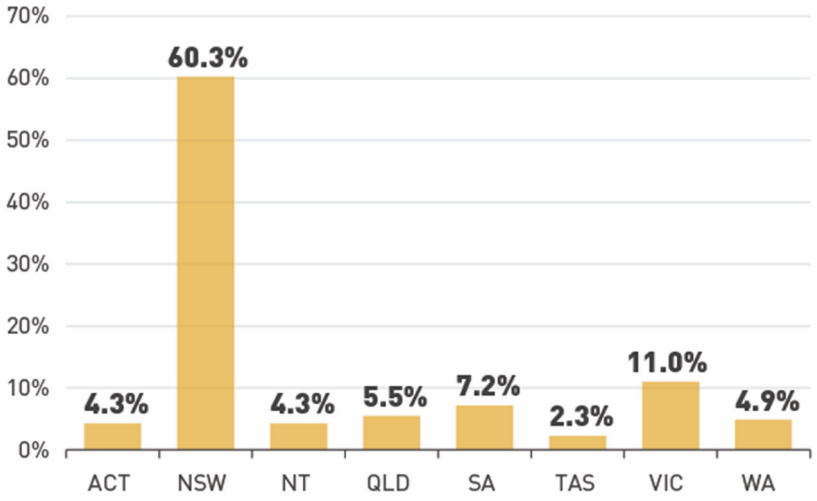
Several concerns were raised about toxicity, with issues such as atmospheric pollution from furnace fumes and rubber crumb breaking down and being released into the surrounding environment raised in many comments.

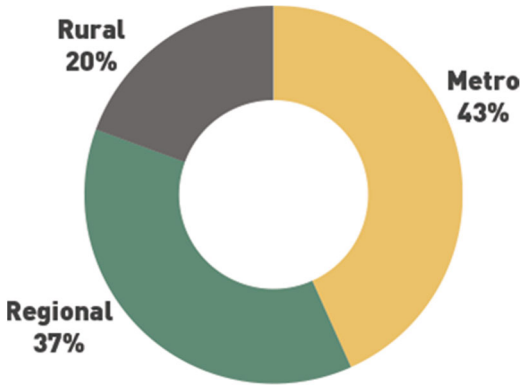
RESPONDENT DEMOGRAPHICS

Gender

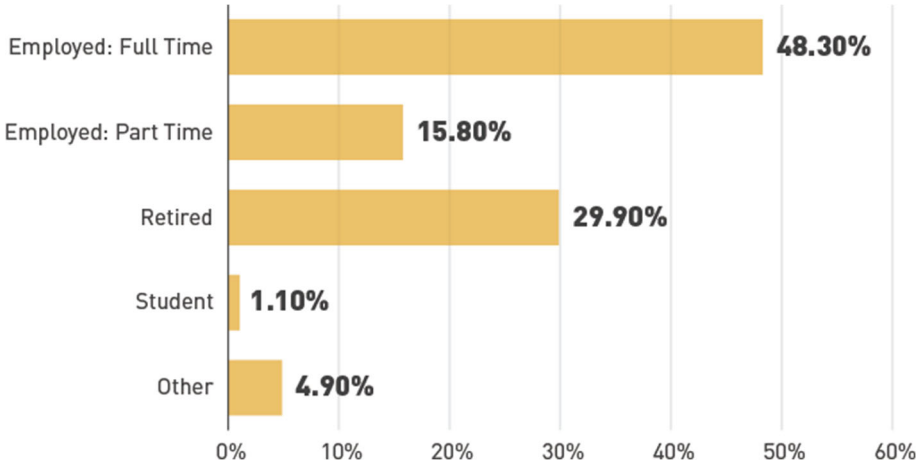


Location





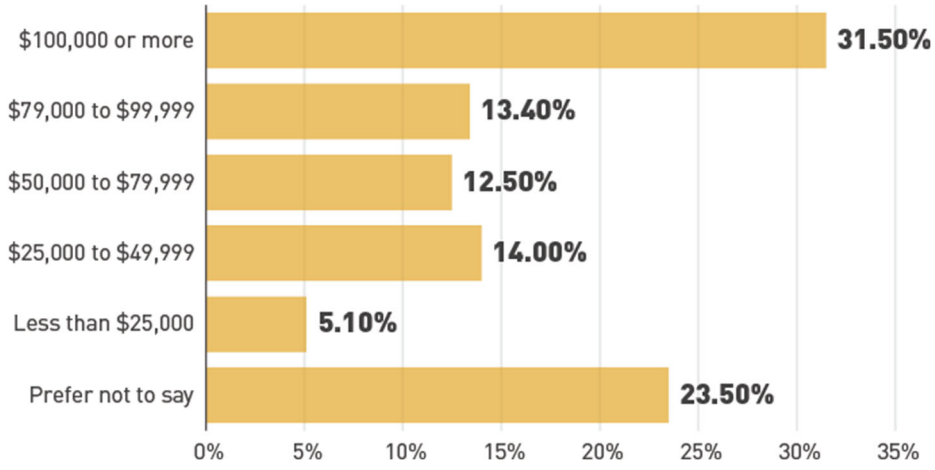
Employment Status



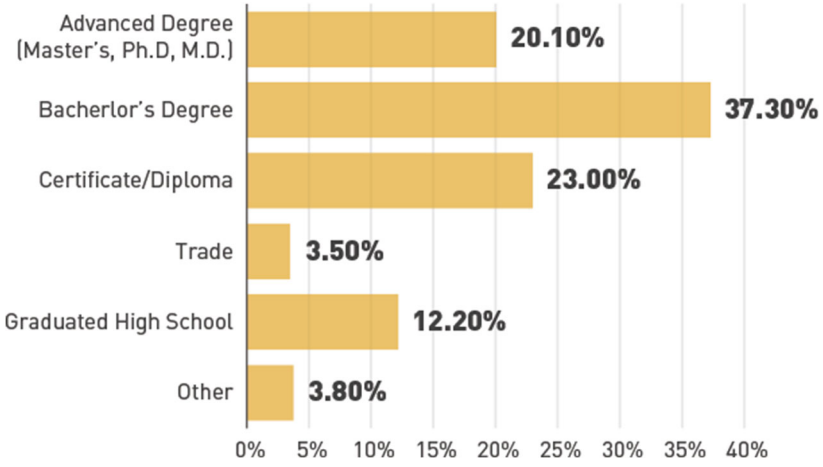
Field of Employment

Accounting / Finance / Banking	1.20%
Administration / Clerical / Reception	5.30%
Advertisement / PR	0.60%
Architecture / Design	0.90%
Arts/Leisure / Entertainment	0.90%
Beauty / Fashion	0.60%
Buying / Purchasing	0.30%
Construction	3.90%
Consulting	3.00%
Customer Service	0.60%
Distribution	0.30%
Education	13.40%
Environment	13.90%
Government (Federal/State/Local)	19.30%
Health Care (Physical & Mental)	2.10%
Human resources management	0.60%
Management (Senior / Corporate)	1.50%
News / Information	0.60%
Operations / Logistics	0.60%
Planning (Meeting, Events, etc.)	0.30%
Production	0.60%
Research	0.90%
Restaurant / Food service	0.30%
Sales / Marketing	1.80%
Science / Technology / Programming	1.80%
Student	0.30%
Homemaker	0.90%
Resource Recovery / Waste Management	3.90%
Retired	13.10%
Other - Write In	6.80%

Annual Household Income



Level of Education Achieved



APPENDIX 1: SURVEY QUESTIONS

1) Do you think disposing of old vehicle tyres is a world-wide environmental problem? *
( ) Yes
( ) No

2) As a customer buying new tyres, you are charged a recycling fee by the retailer for your old tyres. Do you think the retailer does recycle your tyres? *
( ) Yes
( ) No

3) When you leave your old tyres with the retailer. Do you know how they are recycled? *
( ) Yes
( ) No

4) From the processes below, select the one you consider to be the most responsible *
( ) Crumbed and used as infill for sporting fields and playgrounds
( ) Chopped and utilised as furnace fuel (e.g. cement kiln)
( ) Exported for recycling/processing overseas
( ) Processed back into oil and carbon
( ) Sent to landfill
( ) Other - Write In: _____

5) Briefly explain your choice for the above question

Page 2: Tell us a little about yourself

6) What gender do you identify as?
( ) Male
( ) Female
( ) Transgender Male
( ) Transgender Female
( ) Gender Variant / Non-conforming
( ) Other - Write In
( ) Prefer not to answer

7) Employment Status: Are you currently...?
( ) Employed full time
( ) Employed part time
( ) Retired
( ) Student
( ) Other - Write In

8) In which field do you work?

( ) Accounting / Finance / Banking
( ) Administration / Clerical / Reception
( ) Advertisement / PR
( ) Architecture / Design
( ) Arts/Leisure / Entertainment
( ) Beauty / Fashion
( ) Buying / Purchasing
( ) Construction
( ) Consulting
( ) Customer Service
( ) Distribution
( ) Education
( ) Environment
( ) Government (Federal/State/Local)
( ) Health Care (Physical & Mental)
( ) Human resources management
( ) Management (Senior / Corporate)
( ) News / Information
( ) Operations / Logistics
( ) Planning (Meeting, Events, etc.)
( ) Production
( ) Real Estate
( ) Research
( ) Restaurant / Food service
( ) Sales / Marketing
( ) Science / Technology / Programming
( ) Social service
( ) Student
( ) Homemaker
( ) Unemployed
( ) Resource Recovery / Waste Management
( ) Retired
( ) Other - Write In

9) What is the highest degree or level of school you have completed?

( ) Graduated high school
( ) Trade
( ) Certificate/Diploma
( ) Bachelor's degree
( ) Advanced degree (Master's, Ph.D., M.D.)
( ) Other - Write In

10) Which State are you located in?

( ) ACT
( ) NSW
( ) NT
( ) QLD
( ) SA
( ) TAS
( ) VIC
( ) WA

11) Is your location

( ) Metropolitan
( ) Regional
( ) Rural

12) What is your annual household income?

( ) Less than $25,000
( ) $25,000 to $49,999
( ) $50,000 to $79,999
( ) $79,000 to $99,999
( ) $100,000 or more
( ) Prefer not to say

Page 3: Thank You!

APPENDIX 2: DETAILED RESPONSES TO QUESTION 4: OTHER

- Chopped/ crumbed and used in road base material
- A combination of all
- Advanced Thermal Treatment
- All except overseas and landfill.
- Any and all processes that are proven to be safe for the environment would be the sensible answer to this question.
- Any reprocessing that is done in Australia to ensure the product can access the best market
- any reuse activity
- Asphalt ingredient
- back into roads and/or playgrounds/sporting fields
- build recycling processing plants in Australia
- Buttress falling rocks on cliff faces by lashing them together
- cheap earthbag infill?
- Combination
- combination of some of these
- Councils can and have used as a road base
- Create road base, do not know impact on the environment of this process impact on the environment of this pr
- Crumbed and reformed into farm fence posts
- Crumbed and then furnace fuel
- Crumbed and used in bitumen
- crumbed/shredded and used for fill in roadsurfacing
- Crumbled and incorporated into bitumen emulsions for road pavements
- flooring in agriculture settings, wharehouses
- I don't know what the best option is - need evidence based response mandated by gov't
- I like options one,two, and five
- I'm sorry. I've no idea. Which may be why you're doing this survey. Well done. I don't own a car so...
- Maintain highest value by use of Waste Hierarchy
- Make into new tyres, in Australia
- Melted and used for various rubber products eg, posts, surfaces
- need to recover the metal and the rubber(eg. for soft-fall in playgrounds)
- Not enough info
- Of the choices available, it becomes choosing the lesser of evils as such my order would be Crumbed and used for sports and playing, but my preferred outcome would be other options which look at upcycling, reuse and repurposing
- Processed & recycled in Aus
- recycled and processed locally
- recycled back into tyres that are made in Australia

- Recycled for traffic calming measures (see traffic calming Australia website who used recycled rubber for their traffic calming products).
- recycled in Australia - could it be used in road base or some other building material?
- recycled into useful things, not sent off shore
- retreating where appropriate
- reuse
- Reuse rather than recycle. Paint them and use them as decorative hedging, cut and stretch out lengthwise to use in humps, use in parks as seats or bases for tables, use as swings in parks and other open areas, etc
- Reused in any way in Australia
- Road mixture eith bitumen
- Road Surfaces
- road surfaces
- Roads fencing tc
- rubber reused
- scientists explore this -funds
- shredded & used in the manufacture of tyres
- Someone picks them up and takes them away and then I don't know whwere they go to???
- Stockpile for 50 years till they have a value
- Used as reinforcement for buildings (ie; Earthships)
- Used in processes with plastic and rice hulls to make Thermasite for building products. The rubber makes the plastic impervious to the sun.
- Used in Road surfacing
- used in road bitumen
- Used in road making
- used in roads
- Used to make fence posts
- Used to make footpaths and roads

APPENDIX 3: DETAILED RESPONSES TO QUESTION 5

- It sounds as though creating oil and carbon would be the best option if there are markets for those products
- Because that what actually happens
- Seems to be the least energy usage and therefor more environmentally friendly as well as providing a hopefully safe reuse.
- If it's possible to process back into oil and carbon, why not? Seems like the best way to get something useful again! Infill in playgrounds would worry me, tyres contain too many toxins
- The volume , it is very beneficial as crumbed material in bitumen for resealing of roads, fantastic material but needs other outlets as this cannot use all old tyres, cement kilns replaces other fossil fuels and then back to oil and carbon as next option. Need to consider energy use for each application and the best and highest use of the material
- We need a completely closed loop.
- Reprocessing is the most responsible. There are many toxins in old tyres such as cadmium which will be still present if tyres are repurposed.
- I don't know about the cost of this, but at least it goes back to being a useable resource. I'm not sure of the demand for infill. I don't know much about furnace fuel and sending overseas is expensive with unknown processes
- Need a simple, long term viable option which can be deployed in metro and regional areas
- They should be recycled / reused as locally as possible to avoid extra resources used to transport them. Develop home economy and processes in this country
- why would we not be recycling them in Australia. I don't like the infill on sporting fields - it gets everywhere is super hot and escapes into the surrounding environment. Burning them seems very polluting (although i don't understand the details of that process).
- Whole baled tyres should not be exported to overseas destinations. Wherever possible tyres should be shredded and used to make new tyres. Truck tyre casings can be used as re-tread tyres (with controls, tracking & accreditation
- My choice is the only logical solution to protect the environment
- no stockpiling no export of baled tyres
- This seems best use of the potential "energy" in these items - if they can be processed back into oil and carbon, these are valuable resources for going on to produce and fuel other things. It does depend though on the environmental cost of how they are "processed back". Does this create greater pollution, greenhouse gas and other emissions? If this is the case, then re-using for other purposes such as fields and playgrounds would be the better option.
- Other materials may make it difficult to process back into oil and carbon. Send overseas shouldn't be an option, playgrounds may have 'shards' creating contamination.

- If this was adopted as a standard practice and at an economic rate, all Councils (the highest provider of sporting fields and playgrounds) would surely jump at this. If undertaken but at a high cost, then it would not be adopted.
- Hard to decide as I don't have a car sorry but this seems environmentally friendly
- I have seen recycled tyres used in road works and delevoping motor sports fields. We live in an old tin mining town where there are numerous massive open dredges, why can't the tyres be used to fill these areas, along with clean fill?
- Re-using the product by re-purposing it into another product would mean less money is spent on the new product. However, this would only be viable if the cost to crumble into infill was no prohibitive.
- We should not be sending any waste overseas ideally
- Limit dependance on oil. Energy content and technology are available.
- use locally to where the tyres are creating circular economy
- Roads are the most used surface in the world
- Seems to be the most useful.
- Retains the carbon and makes a useful product.
- This option recycles but also supports a local industry - the product is still in the environment (in a controlled manner). I doubt this option can support all old tyres but a good start. Need to look at other avenues as well.
- I do believe that old tyres should be recycled but I am not sure of the best way that is compatible with our environment, whether it is here or overseas.
- There are a number of uses for old tyres. I recently heard of an Australian farmer making non-slip mats for cattle trucks out of them. I love the initiative and think they could be used and recycled for a number of uses if they cant be used to make more tyres. However, as someone who recently purchased new tyres I am disappointed that there are NO tyres made in Australia anymore. I chose to buy Made in America tyres instead, but the transport costs and wasted emissions transporting them here is crazy. Cant we subsidise an Australian business to start making them again. For an island nation we are incredibly reliant on other countries to make things for us. The current covid situation makes it clearer than ever.
- I recently spoke with a tyre retailer regarding recycling and he explained how expensive it is to recycle tyres it would be most appropriate for Australia to recycle their own 'waste'a a priority not just tyres.
- The recycled material serves a good purpose without creating any emissions
- Surely we can recycle them here, each country should recycle their own tyres...
- The rubber can reused to make new tyres or other products.
- Seems to work. Can be processed locally - less supply chain issues. Also makes local community responsible.
- Your survey is flawed as you clearly have not identified all of the processes available in your list. Just take what works and do it NOW!!
- Back to the original product ready to be used for other products . Second best way to used it for sporting surface
- less pollution etc
- I want them to be recycled, ideally in Australia. I don't feel confident that we know enough about long term impacts to be comfortable using them as infill

- There is a visible end product.
- I have seen where old tyres are melted down and made to create hard wearing road surfaces. This makes so much sense, but also crumbed to use on sporting fields and playgrounds is recycling at its best.
- It makes sense to use them for fuel and there are only so many horse arenas and playgrounds to cover. better to use them and get rid of the problem for ever
- I simply have no idea, this seems a responsible solution
- These products are much more valuable in terms of their re-use and application, while options for use of non-processed tyres is limited due to down-cycling and not able to be endlessly done (upcycled).
- Chopping up tyres for use in sporting fields or roads is a very close second, but is contingent on there being enough uses for the ground up tyres. By turning the tyres back into oil and carbon the stockpile of tyres is eliminated, and the materials can then be reused
- I'm not sure sports fields/playgrounds are the answer due to accumulating chemicals, what about road base?
- I asked where the tyres go and who recycles them. They are collected from the local site and transported to Golbourn and then to Melbourne for processing.
- Appears more environmentally friendly, providing there are safety measures to protect the sporting field
- Finding a long-term reuse is important and this uses a lot of the material with little wastage
- Not sure of the process for my choice but surely better than burning, landfill, exporting.
- Good balance between end result and energy/pollution associated with end result.
- Limited uses for recycled tyres. Extracting the resources is probably the most environmentally sound outcome.
- Because they are being recycled back into the community, which will benefit the kids and sports people.
- It seems like a practical and safe use of the material.
- Should reduce the need for new exploitation of oil.
- We have just had a safety ramp installed at our home made of old tyres. Processed in Australia would be the best option - definitely not exported. Use funded researchers to work out the best options now and in the future.
- Also, crumbled into shared pathways/cycleways...some are already in place and are excellent!
- I understand this is widely done in Europe and therefore should be easily transferrable technology
- it make sense
- If that was possible why would you not do it? The raw materials can then be used for something else!
- Australia resurfaces thousands of kilometres of roads every year, as well as building new ones. Rubber crumb has been proven here and in many countries to improve road pavement performance. It's a no-brainer to recycle tyres in this way.
- I am not sure if crumbed rubber used for playgrounds goes to landfill after it breaks up. If it does not go to landfill, that would be my first choice.

- many playgrounds use soft fall so this would make it a circular economy that the public can see.
- Seems like a good use for old tyres
- adds least to greenhouse gases
- More possibility of them being reused
- A more ecological outcome, with less air pollution.
- Giving the material a subsequent life uses the tyres after their life on a wheel, in a new found useful purpose.
- I 'think' processing the back or burning them would do more harm than good but crumbling them for reuse on sporting fields, playgrounds (and why not blending them into road base?) is a better long term and useful solution. Perhaps halved, piled and secured and used as raised gardens commercially and privately?
- I have bought crumbed rubber and I know it came form recycled tyres.
- SEEMS THE MOST ENVIROMETALLY SESIBLE OPTION
- All other options will most likely end up polluting the environment in some way sooner or later. If they are embedded in earth or concrete in a permanent structure, it is highly unlikely for them to cause pollution or contamination in the years to come.
- My assumptions: 1 would be done locally thru investment not shipped O/s 2 closest option to a pseudo closed system where by breakdown into base core components for recycling
- Reuse of material and the avoidance of using another material
- Useful and minimal / no emissions,
- My best option
- Best use as a resource. I also think it should be recycled as road-base.
- Seems to be the most sustainable as it's being re-used for something that would otherwise me made from 'virgin' material.
- I think I have heard of this being done in Malaysia. Makes the bitumen hard wearing, however if this is not so number 1 option would be my choice.
- Tyres need to be recycled. I'd love to see regional facilities in the rural areas for recycling of tyres. If a processing plant and production of items eg mats, crumbed for use on roads, playgrounds etc it would reduce heavy transport carting tyres to others factory centres causing damage to our roads, make employment, sales of items back into the communities. Its so important to address all these issues, environment, local industry, employment and being more responsible & aware of our impact on our world. Thank you
- Most sensible
- From fuel. To fuel.
- Least by products
- At least the product can be reused
- Recycling back to its original form to be remade into tyres again saves using new material.
- See comments provided in 'Other' above.
- It works.
- I don't think there is currently a viable alternative to tyres we have, so rendering them back so the raw materials can be reused sounds like a sensible solution. I do worry about leaching when recycled into other applications, apart from road surfacing, which seems quite beneficial - so long as people don't dump them on their land.

- Make use of the whole recycled tyres
- Purposely reused without harmful emissions entering the atmosphere as would be if used for fuel
- When considering the recycling option you have not given any indication of the carbon footprint that each option creates and what viable return on the recycled product gives. Or the MJ or Hz required Potentially land filling could be the most environmentally friendly option
- Trye - 1st use Crumbed - 2nd use Oil & Carbon processed - 3rd use (local)
- it sounds the most environmentally sound solution
- My thinking is that this would be a reasonably environmentally friendly use of old tyres, without sending them off shore (and not knowing the outcome there). Not sure how long they take to decompose but guess it would be a long time, so landfill not a great choice. Reducing them back to their elements I think would take a lot of energy and maybe produce undesirable nasties in the process
- Costs money to export; if used as furnace fuel it will pollute the atmosphere so reusing for sporting areas or seats or roads is much better.
- I am an equestrian and the shredded tyres make excellent additive for a sand arena. Also doesn't need to be watered as much when the rubber is mixed with the sand
- Upcycling has the lowest impact on our environment
- I do not have all the facts & only knowledge that various self-interest groups like to publish.
- Local solution and environmental recovery of energy and iron
- Tyres should be recycled locally, rather than sent overseas
- Don't know the cost or expertise involved so not even sure if it's possible but the other options are just passing on the problem.
- I think that would be a good use for it - that's all
- Better use it twice than once :)
- Playgrounds need the soft cushioning rubber matting I hope it is made from old tyres
- Can be crumbed and used as infill, maybe it can also be used for other stuff. Buildings / construction Retaining walls Garden beds Road / path base
- Been done before and appears to be very successful.
- Community sport needs all the help they can get.
- This takes in all tyres, is there a call to use all tyres for infill etc, which is also a good option but the day will come when that has to be taken ie replaced?.
- Australia needs to start utilising collected recycled materials into useful products. We must do this in Australia not send it overseas.
- Turning tires back into the original materials is the best recycling then it can more easily be used to make something new or better still new tires. It's this actually possible?
- A process that enables the tyre to be part of a Circular Economy and used again at end of RE-use life.
- All Councils are crying out loud for additional sports and activity facilities . With state of the art processing options there is a real opportunity for Councils to take advantage of these processes to provide improved facilities
- Reduces landfill

- This would result in the lowest environmental impact and result in no further carbon emissions
- Adds to local amenities
- Raw materials will be continually re-used. If the process uses more energy than produced, or creates pollutants it may not be worth it. Using the rubber for other products may be a better option.
- the option I have selected retains the material and its energy values, so in time t could be re-used an additional time, say for cement fuel.In other words, "two bites of the cherry" !
- waste is going to landfill anyway
- I think we should look into reusing old tyres for making new roads. Hopefully then the roads would be more durable and easier on the cars and drivers. No more pot holes !
- Lowers cost of building materials, encourages earthbag building
- Burning releases toxins. Sending overseas does not encourage recycling or reuse of our waste and it not any other countries responsibility to manage our waste. By converting into soft fall or road base we are repurposing tyres and keeping them out of landfill.
- Makes sense
- This process recycles tyres into their original elements. Only concern is the energy cost.
- either this or crumbed and used for sporting fields and playgrounds sensible recycling and re-use
- Recycle the tyres.
- Makes the most sense
- Just burying the problem is not a solution. Repurposing gives more life to the product but it will eventually degrade and become a bio-hazard in a different form. The micro world is also vitally important. Making tiny pollution means much more difficult and expensive retrieval of breakdown products. Out of sight, out of mind attitudes mean that nothing will be done to produce a viable long-term solution.
- Most benefit to the community
- My experience of the last 15 years in the recovery industry
- Why not?
- Gets rid of them out of Australia.
- They are a huge problem and they have a use so they should be utilized not just put in landfill or the ocean
- If I had had the choice of multiple answers i would have chosen that. They could have been shredded and made into tar I believe. I thought they also could be used in new tyres. Should be done in Australia.
- Least harmful
- It just makes sense
- seems the safer for all
- All other options have ongoing environmental consequences. They should be broken down and reused as best as possible.
- The choices are limited, sending them overseas would be the worst choice and I dont know if the others cause more environmental damage, so that is how I made my choice.
- It would appear to have the least overall environmental impact.
- I was going to choose crumbing and infill as sporting/play grounds but I hear there may be carcinogens in the mix which is harmful.

- This process, although seems new, is already proved successful (according to one report).
- There would be so many old tyres and I think this would be a better environmental option. Could also be used with road base
- Tyres are very contaminated materials and careful treatment if necessary
- LESS CARBON IN THE ENVIRONMENT AND MAYBE COST EFFECTIVE
- this is the only option I've heard of. I hope they are doing all of these things! There is no need for tyres to be going to landfill!
- Seems the most logical
- My preferred answer would have been one regarding the recycling and processing of tyre waste here in Australia ie dealing with our own waste in a safe and sustainable way, encouraging us to be more innovative with our waste and to create sustainable domestic markets for tyre waste broader than just use in sporting fields and playgrounds (which I think can be limiting). Whilst I am aware that tyres are highly calorific making them ideal fuel for waste to energy, I don't know enough about this technology or the processing of tyres back into oil and carbon to know if they're viable (given impacts on the environment, the community and economics).
- think it would be a total recycle that way
- I believe there are real opportunities for reusing the rubber with industry - put a value on it so people are more inclined to do the right thing
- retreating for reuse has the most environmental benefit
- I understand that old tyres were in some way used in the asphalt to resurface a steep and winding section of road in our area. It has stood up pretty well, while a lot of our shire's roads are very pot-holed.
- It seems to be the most environmentally friendly but I really don't know enough about the environmental impact of processing into oil and carbon or using as furnace fuel. I am against just sending them to landfill and also against shipping them off to another country to deal with our waste.
- Allows for re-manufacture into something new - circular economy.
- We need to take ownership of the problem, and this is the most environmentally friendly option for their disposal. Sending them overseas exports the problem, processing into oil and carbon is expensive and takes us back to the pollution source, landfill is NOT an option, and furnace fuel increases pollution as well.
- seem to be able to do can be done locally in Australia
- Recently saw this in the media. Great idea. Should consume tyres and make a post that is vermin and ant resistant. Manufacturer should be supported ... whoever they are.
- Recycling
- The tyres are broken down into raw products which can be reused to make new products.
- If subject to most effective filter and burning process then material is entirely disposed of with an energy side benefit.
- Nothing to burn or melt, just chipped and glued together.. better option
- Turning tyres back into oil and carbon is more consistent with a circular economy and hopefully less toxic for air and soil (as using for fuel or using under sports fields would be). Tyres are toxic.

- Appears to be the most environmentally friendly process providing there is sufficient demand for this disposal
- We would see the infill in use so we know it is recycled. Sports fields do not damage the environment. We would not know what the outcome would be if we recycled as per the last 5 suggestions.
- Least impact i think. Those sports fields are terrible I hate that we dig up natural plants to put int he concrete crators filled with tyres. Sending oversees is not a good idea considering our distance and transport costs. Land fill is not appropriate for anything.Burning fossil fuels is bad for the environment. Oil and carbon ar reusable I think.
- To re-use and make a resource from the material seems the best idea. Anything that uses the resource as 'fuel' however, does add somewhat to the emissions that would be made from doing that
- I use petrol and oil
- I understand that my tyre retailer has used tyres collected by a business which may crumb and use some rubber locally, but also bales and exports them. I imagine there may be intermittent market for tyres to be used as furnace fuel too.
- if we don't have to get new oil but can reuse the tyres, it helps with that as well. Otherwise, use for playgrounds, sporting fields or other uses that stop them going immediately to landfill but see as many uses as possible
- Surely it can then be made back into tyres after it's processed back into oil and carbon - making them truly recyclable? Crumbed and used for infill sounded OK but it's only recycling once really - or not even recycling, repurposing, but then what?
- returns the materials back into base products. Playground usage is common but they slowly break down into the surrounding environment so not that great.
- Big overseas, small process footprint, grinds tyres into energy
- We should take responsibility locally for the resource and find new uses for the material. The last two sound not so climate-friendly, though I don't know much about the processes.
- Reusing the materials, and not sending them offshore
- Best use for old tyres
- Reuse the resource.
- This is real recycling.
- Using the tires as soft fall is a practical and permanent safe solution for sporting fields. It is not being used as fuel, which then may send toxic fumes back into the atmosphere. The other use for tires is using them for playgrounds as obstacles for the kids, or for retaining walls.
- Be part of the circular economy - if it's used here, dispose of it properly here
- Recovers the original components. Next best is use infill but it remains in the environment
- There are many uses for old tyres, I know it can be expensive but we need to be able to recycle old tyres as they are used so much in our society.
- Tyres are hard to recycle and are toxic to use in garden but if they can be responsibly recycled as close as possible to where they are that's good and making park base is a great idea

- One way they can be recycled.
- Two uses
- Before being crumbed or chopped, I feel as though tyres could be used for a number of different purposes e.g. equipment and furniture (chairs, playground equipment etc. Once they have then reached their end of life with regards to this aspect they can be crumbed and then finally processed back to oil and carbon. I don't think it should be a one size fits all approach.
- Good use of old tyres , high demand for this product.
- Because ot os recycling the material. Also could possibly be used for roads
- * Sending to landfill gives these high embodied energy products no second life; * Other uses such as road surfaces risk abrasion and microplastic runoff; * Exporting increases shipping emissions * Loss of embodied energy in re-processing back into oil/carbon * Should reduce burning fossil fuels, whether virgin or second life products
- Re use of resources is critical
- Should be the most environmentally responsible as they can be reused to produce energy. However unlikely to be economically viable.
- If they can be reused without creating any further impact eg emissions that would be my preferred choice
- replacing other virgin materials,
- I've done that already in 4
- Obvious choice. Return it to its original form and reuse.
- How ever the tyres used they should either be recycled or repurposed.
- Saves using more natural resources
- They are serving a useful purpose and not creating another problem for the environment.
- There are many kilometres of roads that require resealing each year. Crumbed rubber is a known additive to provide good results in road seals.
- No waste and used appropriately
- Utilizes them into a product that would otherwise be produced from primary resources. Not a perfect solution, as it assists the continual production of these products. If leaching of heavy metals was not an issue, I would have chosen "Crumbed and used as infill for sporting fields and playgrounds".
- dont Know
- Option perhaps with minimum greenhouse gas emissions
- knowing that they are actually being repurposed as roads etc would be good for everyone
- Reused in an area that this is required
- We should be recycling here in our country and providing employment in our country
- As long as there is a means of "scrubbing" any fumes! Perhaps a closed loop? No release into the atmosphere!
- cheap energy
- I suspect that less energy needed for processing. Not sure of the correct answer to Q2. !
- It should be determined by the best science not just opinions
- The bigger problem is small tradies, builders truckies etc. and others who stockpile on their land . Council is very reluctant to act on these small stock piles which people often bury on their own or public land and EPA only acts on large stockpiles. An area of very

little compliance as with so many things these days - lots of regulation and no actual compliance action.

- There is a use for all materials
- If tyres can be recycled and mixed in with a bitumen mix this may reduce landfill/ stockpiles
- I don't think the other options are sustainable and/or environmentally responsible
- reuse is good
- Converting them back into energy seems the best use for such a large amount of tyres. All other methods seem to have limited application
- Maintain highest value by use of Waste Hierarchy -- this includes Crumbed and used as infill for sporting fields and playgrounds -- but is not limited to this
- that is how it started, it should be how it ends. alternatively it could be crumbed and reused but I could only select one box
- The above process closes the cycle for the product and should mean less new oil is required to be used and the technology is available in Australia.Note steel is also a product of this process
- closest to closed loop sustainability - recycled
- are there enough sporting fields and playgrounds to use all the recycled tyres ?? any recycling, as long as it is local, not offshore, and is useful, and it can be done for all tyres. I like the idea of being processed back into oil and carbon, but don't know much about it. is it energy efficient ? great idea to leave oil in the ground and use what we already have.
- Used for purpose in which should not be as devastating to land on
- not burnt or sent off shore
- I know that industry uses waste tyres as a fuel
- Environmentally least polluting except for fuel involved in processing
- best opportunity to turn the product into a resource rather than a by-product or being landfilled. I'm not sure of the filtering capabilities of furnaces to capture the noxious gases generated by burning this product.
- If Councils can use the old tyres in their road/asphalt mix WHY NOT use the old tyres as we know how much road works Councils have to do??!!
- Known to have been used by some Councils or road constructions
- Believe it is a proven process and more cost effective than other forms of road base
- Some of the above uses are OK (e.g. back to oil and carbon or use in sporting fields and playgrounds) but more uses must surely be possible. I am aware tyre material can be used in road surfacing material-is not mentioned in your choices; presumably many more uses possible. Artificial reefs along the coast to provide substratum and shelter? Make rubber mats for house entries; think of replacing hard/softwood for pallets and for making construction site temporary floors etc, etc.
- This method of reuse is the most environmental friendly
- I really am not sure but it would seem more environmentally friendly to do something onshore,
- I have absolutely no idea - but this idea, comes across to me as the most appropriate given the other options. Exporting them would leave a carbon footprint, as would further processing, and everyone knows burning rubber is bad for the environment!
- It doesn't release further emissions into the environment, which would create further air pollution. However upon further thought it would use a lot of water to clean them first.
- It provided a 2nd use industry

- Have read about playground bases being manufactured from recycled tyres. Trust that's what's happened to mine!!
- The amount of tyres being recycled there are only so many ways we found you use them in sporting and recreational use. I see a lot of oil being drilled from the ground. I see that it will run out. Tyres are a look based product as a solid form. Breaking it down and using a waste product as fuel can in one way be a help to the world oil supply.
- This should be the highest value use for the tyres (but does not always happen due to low use of the end product)
- Recycling should happen in Australia and be a product that will not breakdown any further. A better source of oil and carbon than extraction.
- Seems the most sensible option environmentally and I love repurposing
- They cease to exist
- The one I am most aware of.
- Reuse to extend product life
- Stockpile for 50 years till they have a value in the open cut mines in the Hunter Valley.Rail networks,roads,security of the sites already exists.Miners have the responsibility to rehabilitate the site and could absorb the cost of burying the tyres.Fire is the only danger but with no bush fire threat , tyres in a hole and being constantly being covered with earth the danger of fire can be minimized.By placing all the tyres of NSW in one location we make it economically viable to turn todays rubbish into tomorows resourse.
- this is a use for them that means they are actually recycled and hopefully the CO2 they store is not released into the environment (as opposed to them being used as fuel).
- This process will help reduce the demand on our diminishing oil reserves.
- Old tyres shouldn't be recycled for purposes such as growing food because they can have toxins that plants can potentially uptake. However it's important to find a use for old tyres. Why send them overseas? Australian tyres should be recycled locally, by local industry, for use back on Australian roads to keep Australians safe (eg traffic calming devices such as speed cushions, round a outs etc). See Traffic Calming Australia website, who use recycled products.
- Yes they are sent to a recycler but I don't know what they do with after they pick it up
- Limited domestic markets
- We need to avoid oil and carbon, landfill, furnace fuel and export. There should be a compulsory product stewardship scheme that has a mandatory price on each tyre for the end of life program. Producers should be responsible for zero emissions ways to reuse or recycle these items. The fund should also report illegal tyre "recycling" to the authorities to eliminate this process.
- least polluting
- No toxic emissions are released.
- Local reuse is the best option, followed by recycling, then energy from waste, then landfill.
- As long as they can be recycled in some way that is economical and viable
- We are aligned with Tyrecycle and I am aware they do the above process.
- Reusing (repurposing) tyres least harmful with better environmental outcome
- Closes the recycling loop and reduces demand on raw materials
- I imagine there are several appropriate uses for old tyres. I have no idea of the pollution from furnace fuel or processing back to into oil and carbon
- Its a good reuse and second life for the material, use as fuel sounds like a reasonably good result as well
- I think it would be the most economical to shred and use in other ways. I do not know about processing back into oil and carbon of what is involved.

- restoration of eroding river and stream banks, roadside protection, use as railings instead of metals, new road construction to hold road base, etc. Burning for oil and carbon may consume more power, hence no net-carbon-efficiency
- They should be processed in the most environmentally friendly, efficient method that has the most beneficial application.
- market for crumbed is too small export & furnace fuel is wasting a resource landfill should only be an option if its dedicated landfill capable of being 'mined' in the future once technology has caught up
- The embodied energy is kept intact (or seems to be) for a long time, and seems to require less energy to process compared to others, and doesn't generate toxins and ghg emissions as infill. Also better oversight of potential contamination issues within Australia rather than overseas.
- Useful
- Softfall made from old tyre is so better than concrete. However there is an issue about removing the wire. It has to be done. Im not sure about reusing as furnace fuel or oil but is also a good option but not sustainable.
- Tyre recyclers ship it overseas to be burned. I have spoken with people from within the profession. In much the same way it is not common knowledge that plastic bottles are used for their carbon content.
- Better to reuse. No energy is spent. Recycling requires energy use.
- I have no idea, I don't know enough about it? I am guessing that we produce much more than can be repurposed.
- ??
- This would probably be the best option for the environment, rather than creating more oil, but it all depends on where it happens and the environmental monitoring
- It depends on whether there is enough demand for this or any other use, where the best demand is should determine what the best end use is. I'm aware of the tyre recycling scheme so perhaps the tyre/car seller does recycle- I can't be sure.
- Repurposing it in a useful manner
- Crumbed - too toxic better to recycle back to original state and reprocess to a high value product.
- For Q2 I wrote 'yes' but my answer is actually 'I don't have a clue'. For my answer to 'crumbed - playgrounds', it is because we need to find a useful recycled use in Australia and not ship our problems overseas where we have no control / big transport footprint. However, I'd like to know if there are any toxins in the tyres that could be a potential danger for children / sports people. Burning for fuel adds to CO2 (and other toxins?) so doesn't seem like a clean solution. Maybe processing into oil & carbon would be an option but I don't know enough about pros & cons of that. Landfill does not solve the problem of waste, especially if we are actually meant to be paying a recycling fee, which I had not been aware of! (but fully support)
- This would provide a fuel for generation of other material. Not sure if it would be of benefit to transport overseas for processing. Has a cost / environmental impact study been completed for any of the options listed.
- limited processing facilities in AU
- Maximise the recovery of consumables, reduce the need for new material mining
- A good use for tyres having a direct benefit for people
- saves using other materials, plus has a cushioning effect.
- I don't believe in exporting our environmental problems overseas. There are a limited number of sporting fields and playgrounds to service. It depends on councils purchasing the product. Landfill is out of the question. My response choice for the above question is

based on my desire for us to reuse appropriately. This seems the best option and allows for the retrieval also of the steel present in most tyres.

- Putting our disused items to productive uses
- Seen trials of this use and think it practical.
- We should not produce resources that can not be reused
- reuse is better than landfill
- Assume the crumbing process uses the least amount of energy to recycle/ reuse
- this is the ideal, at the moment i dont think it is feasible but hopefully technology will evolve to make it the most environmental friendly option
- Recycle responsibly
- It would be great to see that the tyres are recycled into something else that is as ecologically friendly as possible
- My uneducated opinion that is the most environmentally friendly outcome.
- less pollution, contamination or leaching of heavy metals into the environment and/or social settings
- The other options are not actually dealing with the problem - nor using the material for a purpose that is good for the environment.
- Processing back to oil will prevent use of other resources.
- Need to retain as much of the resource values from the tyre as possible. So reuse of tyre is better than reducing it to fuel value. Refer to the waste hierarchy
- Hopefully then the oil and carbon can be used again,
- Aimed at a circular economy and allows tyres to be recycled in a safe and sustainable way
- reuse is important
- Reuse ahead of recycle. every time. And if it displaces the need for fill that's a bonus.
- The selected choice will ensure the lifecycle of the material is assessed and the material is repurposed and reused in a different capacity as opposed to having an end of life use.
- I would prefer old tyres were used as road base actually. It's useful and not in the usable earth like sports fields.
- That and sending to landfill are the most conservative options in terms of carbon and energy. I prefer reuse for building materials, artificial reefs and potato growing etc etc etc
- It may have the least environmental impact (not sure) and may be a more practical option - but I don't think it would be suitable for the volume of 'old' tyres.
- They have a productive 2nd life and save the use of virgin materials
- Because you allow only one choice.
- Good to see it reused in the community
- Will save using non renewable products
- This makes use of the old tyres using the minimum amount of energy.
- Innovation required
- i THINK THIS WOULD REQUIRE THE LESS PROCESSING
- As it seems like the most useable. Using it for playgrounds means micro plastics continue to enter waterways
- chosen without knowing the actual energy consumed to make all the other options. Crumbing may be more environmentally beneficial than processing back into oil and carbon or using as furnace fuel.
- Is used locally and we can evaluate and know it is actually done rather than shipped to poor country where it may end up being burnt or put into landfill. We should take care of our own waste
- Keep them out of landfill and especially keep them from being exported and burnt
- Not used as landfill then.
- Seems .most sustainable and cost effective