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*The Science of Kindness
Bending rules by order
Paritutu evidence ignored
Dust: can we ignore it?
Think Big to Think Planet!
Haz substances kill rate...*



**NZ INSTITUTE OF
HAZARDOUS
SUBSTANCES
MANAGEMENT**



GLOBAL WARMING

USEFUL ORGANISATIONAL CONTACTS

NZ Institute of Hazardous Substances Management

www.nzihsm.org.nz

The official home of professionals committed to the safe management of hazardous substances and dangerous goods. The NZIHSM is a 'not for profit' industry association specialising in improving safety, health and (site) environmental performance, particularly the safe management of hazardous substances in the community.

Responsible Care NZ

Box 5557 Wellington 6145

Responsible Care NZ works with industry partners to implement the hazardous substances legislation.

WorkSafe (MBIE)

www.worksafe.govt.nz

Government agency formed to provide compliance and enforcement of hazardous substances. Responsible for hazardous substances certificates.

EPA

www.epa.govt.nz

The EPA administers the HSNO Act and supplies extensive information on working with hazardous substances.

Ministry for the Environment

www.mfe.govt.nz

The Ministry administers the HSNO Act, and provides policy, publications, technical reports and consultation documents.

HAZANZ

www.hazanz.org.nz

An association of the safety organisations in New Zealand.

Institution of Chemical Engineers

Since 1922 the multi-national IChemE has advanced chemical engineering's contribution for the benefit of society. Its offices include UK, Australia and New Zealand.

Local Government NZ

www.lgnz.co.nz/lg-sector/maps/

Local Authorities have responsibility for policing building controls. Some local authorities are contracted to Department of Labour to provide enforcement of the Hazardous Substances legislation.

Working towards reality!

Life seems to have abandoned boring of late with items like Covid, cyclones and general chaos causing much excitement for many.

But life is gradually heading back towards normal and most are heading back to a working world, recommencing planetary travel and overseas immigration is reaching new highs, as many offshore folk flock towards the perception of peace that is New Zealand.

In this winter edition of Flashpoint our NZIHSM team too continue in our goal of "protecting, people, communities and the environment", commenting on our society and planet in articles as follows:

- (i) The Science of Kindness – has 'BE KIND' generated any reward?
- (ii) Cleaning up after the Cyclone Gabrielle – a change of rules;
- (iii) The stock-market as a hazardous area;
- (iv) Solar farms being 'fast-tracked' as our 'oil age' is slowing;
- (v) Hazardous substances a deadly exposure;
- (vi) Life-changing caustic burns through incorrect PPE;
- (vii) NZ Steel – changing 'Think Big to Think Planet';
- (viii) Compliance updates;
- (ix) Archie's ramblings.

Hazardous substance certifiers required

As the Hazardous substance/HSNO regime has passed 25 years, our safety workload is also growing and we are searching for additional HS Compliance certifiers. To assist with this, Worksafe, NZIHSM, HSPNZ and HASANZ are investigating marketing strategies and Massey University has offered some initial training courses providing knowledge on the treatment of hazardous substances. For more information on this see www.hazsafe.org.nz – certifiers – a job for you?

All of the articles are interesting reads as we look forward to all living with each other and mother nature so we can all enjoy the wonders of our Earth for many generations to come. Enjoy!

John Hickey
President NZIHSM



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Cover photo: ***There is a house under this! This photo from Neil Reid shows a few pieces of a buried house poking up through the silt in the Esk Valley, post-Gabrielle.***

Illustrations are credited where we are sure of the source.

Flashpoint

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The Science of Kindness

Kindness is an under-used scientific tool! - What nonsense is this?

As we all know science is about numbers, gravity and molecules which can only be expressed in calculations, iterations and fancy equations, whereas kindness is a human concept – to understand and co-operate with each other and our surroundings. Just try and work out the equations on that!

But perhaps if we have learnt lessons from science, it is the art of understanding reality and survival. Humans have been in control of our beautiful planet Earth for as long as most of us can remember, but shouldn't we use scientific method and look at the numbers to see if there is a case for kindness as a scientific tool.

The Scientific hypothesis

So, what is the scientific hypothesis and are there any numbers to back this theory?

The concept recently proposed to get New Zealand away from one of the most deadly viruses to strike the human population in a generation was "BE KIND".

So the scientific hypothesis is 'That by being kind humans can solve many of their earthly science issues'

This of course is a vast topic, so initially to test this theory in one article, we will just restrict our issue analysis to recent weather and disease.

The numbers

So how big is our system and what has been our human role within this.

From what we have learnt from our study of Science over the past few hundred years is that our Human race are only comparatively new arrivals to our role of "Masters of Planet Earth"!

We evolved in a similar manner to other 'life on earth' from living organisms, and much of our authority has been gained from co-operation with other humans as our ancestors rose upright on our hind legs and learnt to reason, systemise and evolved other methods of living in our environment.

So, how are we going and what effect are we having?

The earth first took form approx. 4500 million years ago and life commenced on our planet around 3000 million years ago. Mind you, life was pretty simple at this time!

The fish and the dinosaurs were relatively recent arrivals only being present in the Mesozoic Age some 250 to 100 million years ago and upright humans are even more recent arrivals, being on Earth for approximately five million years with many of Earth's upright apes only leaving Africa to the rest of the planet over the past 200,000 years.

These all seem like big numbers so for perspective it may be useful to limit the total time that the Earth has been around to a single day.

On a 24-hour day basis our ancestors have been here for around two minutes and our modern civilisation of 8000 years is less than a blink of the eye (or a thousandth of a second). We are very new arrivals indeed, and yet it is now believed that as recent as we are, our effect on the planet and environment, especially over the past 300 years, is dramatic.

Affect on the weather

One issue that has been very noticeable in New Zealand of late is the weather process. Over 200 years ago when a French scientist Jean Baptiste Fourier concluded that something in the atmosphere must have been trapping the heat in.

Many years later with our increased knowledge we now call these things, such as carbon dioxide, the greenhouse gases as they allow short-wave ultraviolet energy through but trap longer infra-red heat energy on the earth much like a greenhouse.



This change in our surrounding greenhouse gas atmosphere is leading to some dramatic changes such as:

(i) The planet has been running at an energy deficit in that we consume more than we can create since the mid nineteen-eighties which is not good for a self correcting sustainable process. (i.e.: Spending capital to fund operating expenses)

(ii) Carbon based fuels release CO₂ and water when they burn which is increasing the planets temperature and creating more droughts in some areas and rain in others.

(iii) Hotter air holds more water, so more water or intense rain comes down when it does rain. (This seems to have been very noticeable in New Zealand over the past few years)

(iv) Some species of plant and creatures that cannot adapt fast enough to the changes are disappearing.

(v) Nine of the 10 hottest years recorded have been since 1990 and the rate of carbon fuel burning has increased in line with a doubling of the Earth's population since 1961 and has ramped up in the past 15 years.

We humans, do need to use our science to rapidly balance this energy process if we are to preserve our recent planetary environment as we have known it.

So how have we managed to control our little corner of the Universe to become 'Masters' of our Planet over our recent occupation?

Arguably we humans have achieved the most is where we

- have worked alongside and with each other.
- worked alongside and with our planet and surroundings.

That is, we have employed the "Science of Kindness". As 'Kindness' is Working with others and our surroundings for the mutual benefit

of all. Older texts tell us that that the best method is to "treat others the way you want to be treated ourselves" or mutual co-operation.

We will always have science issues, such as; life on Earth, food and housing, gaining chemical benefits safely, global warming, viruses (Covid), or just ensuring that we do not attract unkind off-planet attention from our billion planetary neighbours.

But how can kindness assist our species with these?

We use our knowledge of reality and/or our surroundings through science to try and control our human and planet's positive future. We have done our best at this when we have learnt to understand and not-fight but to co-operate with the planet and our environment. It is perhaps this human ability to work together, be kind and to co-operate with each other which has allowed us to work with our surroundings to gain our current influential planetary-position. (eg: tigers are bigger, but not so co-operative).

This ability to co-operate together or show kindness to one another and the environment has allowed us humans to be the major player on our planet for the immediate past. But 'the kindness hypothesis' would

indicate that to remain successful it is important that we continue in our learnings to co-operate and 'Be kind' to all our neighbors and earthly surroundings.

Our disease experience and kindness results

Perhaps a good example of this 'kindness theory' in recent New Zealand experience was the attitude of a recently retired Prime Minister who faced with the biggest potential virus threat to humanity in a generation told us to "BE KIND".

Her 'kindness' philosophy that by using this science of 'mutual co-operation and virus isolation' we could achieve possibly the World human's best result against a deadly Covid human virus. So did this 'kindness science' work, and for that we look at the number results where it appears that:

New Zealand had only 0.02% number of cases/population and only 0.2% deaths/case when compared with 12% UK and 6% USA.

Wow, somehow this 'co-operative kindness worked' and many more human lives may have been saved if all humans had adopted the 'work together philosophy' until conventional science had delivered suitable 'anti-viral' vaccines.

So perhaps this result of the 'Science of Kindness and co-operation' may even solve weather and other issues to allow us all to enjoy our beautiful earth for much longer, and shows far more cleverness and understanding than some have given credit for!

But then as our Mums told us, perhaps we are just clever but cheeky monkeys!



The stock market as a HSNO area

As HSNO specialists we pride ourselves in our ability to analyse and classify an area containing materials of a flammable, toxic, corrosive or otherwise hazardous nature to facilitate appropriate equipment selection; key to reducing risk and keeping work environments safe, and critical in protecting people, plant and equipment.

It seems to the writer that, given its vagaries and the fortunes made and lost within it, the hazards of the stock market should be amenable to similar such analysis and classification; for the protection and enhancement of those who chose to invest in this environment.

To anyone with an engineer bent, the up and down movement of the stock market represents a signal that just begs to be measured and analysed. One would think that the typical "measure twice, cut once" mantra of engineering should be able to wrap some discipline around the wild and woolly world of the stock market. Besides engineers are good at numbers; the stock market is made up of numbers; so we should be good at understanding the stock market!

The stock market typically attracts people with a financial background. These people engross themselves in all sorts of technical analysis, graphical evaluation, and prediction of the performance of a particular stock or the entire stock market based solely on its price behaviour. But these so-called traders to get it wrong almost all of the time.

The idea of solving the ultimate puzzle of how to consistently predict stock markets (the Holy Grail) is a challenge that's hard to resist; both from a mathematical standpoint, and the further appeal of course is that solving the puzzle means making money!

Any model of the stock market has to accommodate the wide diversity of factors that can affect the price of any stock. These fall under four main headings: At the company level, is its profitability and growth outlook; the outlook for the industry in which the company trades; the broader economic conditions; and investor confidence or sentiment in a bull or bear market.

Over time any number of engineers have dabbled in this quest for the Holy Grail. Approaches have included the use of Fourier analysis to reduce the cyclical behaviour of stock price movements into a series of simple trigonometric functions;

the use of chaos theory to find order where there is seemingly none; and the use of the concept of entropy to quantify surprise and uncertainty, two daily phenomenon in the stock market.

Others have taken the view that just as energy is the driver in fluid flow, information drives all movements in the stock exchange. They have derived a numerical analogue of the Reynolds number used by engineers to quantify fluid dynamics; a number that can be seen as a measure of stock market dynamics or phases (viz: laminar, transitory, or turbulent). The assumption in this concept however, is that the price of a stock at any point in time has factored into it, in every piece of relevant information known at that point in time; which may or may not be true.

A difficulty in quantifying the stock market is that it is largely controlled by humans making emotional decisions and not some calculable reason or logic. Also, thinking about it logically, if there was an algorithm able to predict stock prices with reasonable confidence, what would prevent everyone from using it?

That said, if anyone ever does discover that elusive Holy Grail of how to consistently predict the vicissitudes of the stock market, I bet it'll be an engineer skilled in the area of hazardous areas analysis; because they know the science behind anything that's being manufactured or the services being offered.

- Dave Lascelles

PS: Nothing in this article should be construed as financial advice.



The Wall St bull market statue in Lower Manhattan.

Bending rules by order

An Order in Council is being drafted by MfE as a possible solution to disposing of post-Gabrielle rubbish. Orchards, vineyards, back yards and riverbanks were all thickly coated in silt in many parts of Hawkes Bay, in particular, as Cyclone Gabrielle swept across the North Island.

Months later the silt problem still exists in some places. In late April it was calculated that eight million cubic tonnes of silt still lay thickly in Esk Valley, north of Napier. It's not necessarily the silt that is the problem in one respect, ... it's all the manky stuff that lies trapped or hidden it, like trees, vines, silt, treated posts, wire, irrigation pipes, plastic sheets and plastic netting, portaloos, appliances such as refrigerators, quite apart from any drums of agricultural chemicals.

Destruction of this detritus poses an environmental problem for local councils as burning of it is strictly against the rules, and it be very selectively handled if it is going into landfill. But for once the rules may have to be bent and an

Order in Council is being prepared with power enabled by the Severe Weather Emergency Recovery Legislation Act, as a solution to allow growers to selectively burn orchard and vineyard flood waste with pollutants in it.

MfE said the possibility of allowing the controlled open-air burning of some waste has been raised. Hawke's Bay regional councillor and orchardist Xan Harding said growers are trapped in legislative limbo, unsure how to address the piles of rubbish they aren't able to dump, burn or recycle in time for the next harvest. If burning of orchard waste isn't loosened this winter, the costs will be significant. He said Hawke's Bay Regional Council estimated the recovery of destroyed orchards and vineyards via recycling would mean a cost of \$120 million for growers, ratepayers or taxpayers.

"HBRC ran a sorting trial on a Twyford orchard, which demonstrated that separation of posts and some plant material was possible but that wire and plastic

were practicably inseparable, all at a very high financial cost," Harding said.

"Burning items such as treated timber, coated wire and plastics is a prohibited activity for good reason. It releases toxins into the air that can be hazardous to health and can leave behind long-term soil contamination. On the other hand, failing to quickly recover destroyed orchards and vineyards has its own consequences, both to the growers, their employees, the regional economy and wider public health."

Kokako Farms general manager Bruce Nimon said he and his workers had cleaned up everything they could on their vineyard but were left with several piles, including 17 km of irrecoverable muddy netting, rubbish, irrigation pipe, wire, posts, nets and vines. "How do you try to return that to some sort of recyclable stream, how do you get the wire out?"

"We did some trials, and it is just not feasible. If we do nothing, then come next summer, we are going to have dust storms. All this silt that should have been incorporated somehow into the soil will now become a dust hazard, and those potential contaminants will blow everywhere."

MfE said it is looking at which parts of the Resource Management

Act could be changed to give landowners and occupiers flexibility to dispose of this waste.

Thanks to The Country



Paritutu evidence suppression claimed

The Ivon-Watkins-Dow story will not lie down...

In the latest revelations authorities have been accused of conducting a long-standing campaign to suppress evidence about the health impacts of dioxin emissions from the production of the herbicide 2,4,5-T in New Plymouth during the 1960s.

Victoria University lecturer Sarah Monod de Froideville argues that at best officials are guilty of 'strategic ignorance' when investigating emissions from the Ivon Watkins-Dow agrichemicals plant at Paritūtū, and at worst, of a cover-up.

From the 1960s through to 1987, Ivon Watkins (later Ivon Watkins-Dow) made the herbicide 2,4, 5-T at Paritūtū, which contained the toxic dioxin TCDD, and was a key component of Agent Orange - the defoliant used by the US military in the Vietnam War, which been linked to cancers and birth defects.

Paritutu resident Steven Parkes said he could remember his mother hanging her white sheets on the clothesline and all this orange

foamy stuff would come across the sky and you'd hear mum go 'oh bugger it I've got to wash the sheets again'.

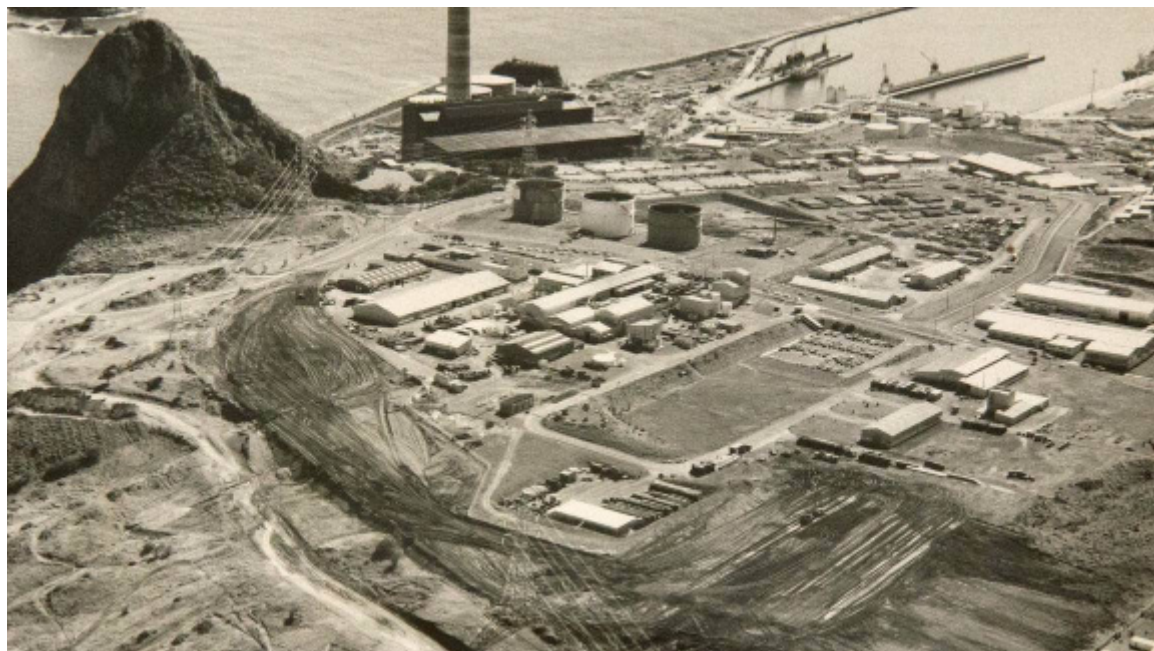
"I can remember taking my surfboard over to Back Beach and seeing this orange liquid coming down the footpath and we used to paddle through it. And I used to see 44-gallon drums from Ivon Watkins on the other side of the road. I'd see the drums and look in them and they'd be bubbling and they were just sitting there."

Since then he has seen neighbours and friends die of cancers. "Six months ago I've just had bowel cancer myself." Parkes said his sister had also had children with birth defects.

Sarah Monod de Froideville, criminology lecturer at Victoria University, said each time authorities investigated 2,4,5-T they looked in the wrong place, examined the wrong population or used the wrong figures.

The IWD plant in the 1960s.

Photo: Puke Ariki



EPA plan for reassessments

The EPA has released a work plan for all EPA-initiated reassessments of hazardous substances over the next three years.

The plan includes indicative start dates for each reassessment, reasons for reassessing a substance, and the existing hazardous substance approvals that may be affected. The aim of the work plan is to help streamline the assessment and reassessment processes and increase transparency in this area of the EPA's work.

There are 15 reassessments currently in progress or due to begin in the next three years, including for aquatic herbicides, synthetic pyrethroids used in insecticides, and domestic use of vertebrate toxic agents (used to kill or control pests such as rodents).

"We carefully reviewed the substances to be reassessed and then looked at various factors, including current use in New Zealand, new information on the substances, and previous regulatory action in New Zealand, to prioritise our reassessments," said Dr Shaun Presow, Hazardous Substances

Reassessments Manager.

"Further reassessments will be added to the work plan, based on the impact they will have on regulating a substance and whether the substance poses an immediate risk to people or the environment."

Solar farms fast-tracked

The Government has referred two more proposed solar farms into the fast-track consent process while it draws closer to revealing new plans to make renewable electricity generation consents simpler.

The fast-track consent was created in the early days of the response to the Covid pandemic. It legislates for an independent panel to consider the consent, shortened timeframes and a reduced number of parties that can make submissions. Its initial sunset clause was extended and is now planned to be part of the reformed resource management system. It allows ministers to send projects straight to the panel, which is administered by the EPA.

The Rangiriri and Waerenga solar farms are planned to produce about 220GWh and 300GWh, respectively, of electricity a year. Transpower, as the operator of the national grid, is named as a joint applicant as it handles the associated infrastructure.

Environment Minister David Parker said fast-track consenting will become a permanent part of the resource management system through the proposed Natural and Built Environments Bill. It has already reduced consenting time by an average of 15 months per project, saving infrastructure builders time and money," Parker said.

There has been a rush of solar farm projects in recent years, but so far only a few have got off the ground, with energy sector experts saying not all of the projects will. But they do represent another shift up in gear as the sector looks to diversify New Zealand's renewable portfolio.

Rangiriri Solar Farm will be a 200,000 solar panel facility and electricity substation on 275ha near Rangiriri, Waikato. If approved, construction will take about 18 months and create up to 120 full-time jobs. The farm will also employ up to nine full-time staff when operational. Waerenga Solar Farm will develop a 290,000 solar panel facility to occupy 385ha across three properties near Waerenga township, east of Te Kauwhata.

The other renewable projects sent to fast-track are: Tauhei Solar Farm project in Waikato, Te Rere Hau Wind Farm Repowering project in Manawatū, Waiterimu Solar Farm project in Waikato.

Meanwhile, consent has been granted for a large solar farm in Naseby, close to the space tracking station on the Dowling family farm. Bay Energy Ltd, owned by Australian company Solar Bay Energy, also has

plans for solar farms in Waimate and Albury, in South Canterbury, alongside multiple solar farm proposals in Australia. The consent in Naseby was granted earlier this year after it was previously applied for but was withdrawn because it was going to be publicly notified. The consent had changed as it added a proposed buffer around some facilities and the development was to be staged.

The solar farm could produce 50MW, enough to power about 9000 households.

The planned development consists of about 80,000 solar panels mounted in arrays over an area of about 55ha. Each array will be ground-mounted, and geared to allow the panels to turn to face the sun as it travels across the sky. The maximum height of each array is about 4.5m.

Landscape screening is proposed along the southern sides of the development, between the solar farm and nearby public roads, including the Ranfurly-Naseby and Gimmerburn-Naseby Rds.

EPA criticised over info handling

The Environmental Protection Authority has been under fire for withholding information about a leak at a suspended oil and gas well-head at Kupe off the coast of Taranaki. Five years, two official information requests and a complaint to the Ombudsman, the agency has released details of its investigation, but only after Climate Justice Taranaki got wind of the inquiry while preparing a submission a separate issue.

The released documents included a 2018 EPA inspection report, which found 'harmful substances' were leaking from a suspended well at Kupe - recently bought by Beach from Origin Energy - and that the leak had not been reported in a timely fashion. Adding insult to injury, when Climate Justice made a follow up enquiry - it was rebuffed once more. The EPA said Beach Energy had produced reports related to mitigation and abandonment of the well and installed equipment to monitor the discharge. "We continue to communicate with Beach Energy on the KS-2 well discharge and other regulatory agencies with responsibilities in relation to the status of the well-head." The other document released was a 2018 Maritime NZ audit of Kupe, which revealed a list of 'failures'. These included the absence of a valid Certificate of Fitness reflecting the new ownership, an out-of-date oil spill contingency plan and failure to comply with its internal Emergency Management Plan.

Think Big to Think Planet!

In an interesting co-operation between politics and industry recently, the Government announced it will assist NZ Steel in a project to reduce carbon off-gases and reduce global-warming, while at the same time maintaining the NZ steel industry and create local metal-recycling so we can maintain some New Zealand industrial and planetary independence.

All of this using funds from the carbon-tax budget, so is self-funding.

This all sounds almost too good to be true, so we will let the NZ Steel press release speak for itself.

The Electric Arc Furnace secures the future of steelmaking at Glenbrook. It will enable New Zealand Steel to

shrink its carbon footprint and will enable New Zealand to be as close to self-sufficient as possible, using renewable energy and recycling scrap steel.

Key facts are:

- the \$300m (approx.) project spend will be co-funded by New Zealand Steel and Government.
- The EAF will enable New Zealand Steel to produce steel with an average embodied carbon per tonne below the world average of 1.9 tonnes CO₂ / tonne steel.
- It will result in approximately 50% less coal use – a reduction of 400,000 tonnes.
- This move will reduce Glenbrook's carbon footprint by 800,000 tonnes from day one - that's 1% of the country's annual

emissions and the equivalent of taking approximately 300,000 cars off the road permanently.

- The EAF will reduce New Zealand Steel's emissions by more than 45% and sets the platform for our net zero goal by 2050.

- It will avoid the cost and carbon miles of exporting about half of New Zealand's scrap steel - about 300,000 tonnes a year.

- It will be powered by an average of 30 megawatt hours firmed renewably generated power.

- The EAF provides stability to the electricity system with steady high demand and an ability to 'turn it down' and provide electricity back into the system at times of peak demand.

- Steel has been produced at Glenbrook for almost 60 years and this will help secure the plant's future for generations to come.

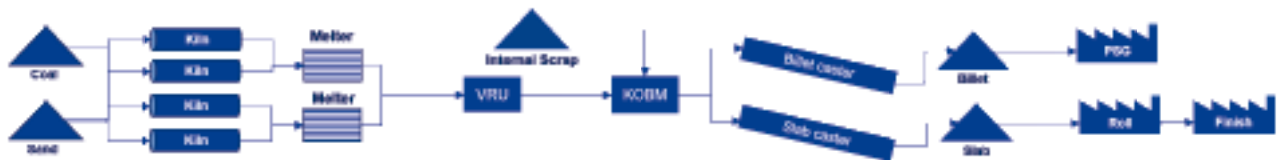
If this even half works, as shown in the attached process diagram, it will be a major NZ planetary improvement, good on them ALL for co-operating !

Electric Arc Furnace THE FUTURE OF STEELMAKING

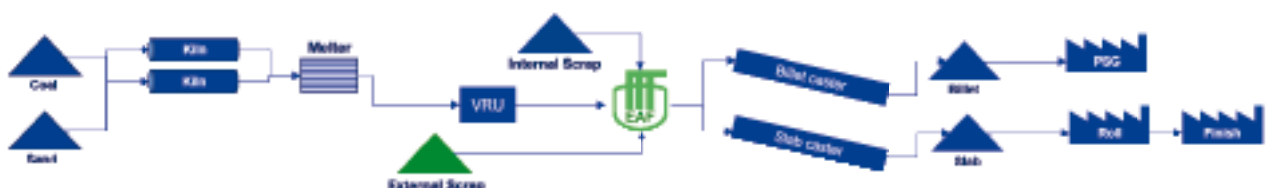


The Electric Arc Furnace (EAF) is a source of electricity at Glenbrook. It will enable New Zealand Steel to shrink its carbon footprint and be as close to self-sufficient as possible, using renewable energy and recycling scrap steel.

Current Process



EAF Process



KCBM - Vacuum Remelting Unit | KCBM - Continuous Casting and Billet Making | PCC - Primary Cooling Coil

\$242k fine for caustic burns

A process worker was working in a manufacturing plant and thought the liquid he was standing in was water. However, it was actually caustic soda and within hours black blisters covered his feet as the corrosive liquid began to eat away at layers of skin and flesh.

He was working at a rigid plastic manufacturing company at the time of the December 2021 incident. Unbeknown to him the substance, also known as sodium hydroxide and commonly used as a heavy duty cleaner, had leaked onto the floor of the Hutt City workplace.

Almost 18 months on, he has lost the tips of two of his toes and his recovery continues.

In failing to issue its employees correct PPE and appropriate training and information when working around caustic soda, the manufacturer breached the Health and Safety at Work Act 2015. After its investigation, WorkSafe charged the company with breaching three sections of the Act by exposing workers to a risk of serious injury or death.

The manufacturer pleaded guilty and the Judge convicted and fined the company \$242,000 and ordered it to pay the worker an additional \$50,000 in emotional harm reparation.

Speaking to the *NZ Herald* following the sentencing, the 62-year-old man said the money wasn't a patch on what he and his whanau endured in the aftermath of the workplace incident.

"I had no idea what was involved in getting better ... it took more of a toll on me than I thought. This will be with me for the rest of my life." The worker, who said he'd asked for a pair of gumboots was told no because he was only a 'temp' said his injuries could have been much worse.

In the early hours of December 16, 2021, a night shift supervisor noticed a container that fed caustic soda, a cleaning agent, into a vat was empty and a step nearby was wet. A hose that helped the flow of the toxic material was split, causing fluid to leak onto the ground.

The system was fixed and a safety chain was put in place to block of the area which was hosed down to dilute the liquid.

The supervisor also told the team to keep away from it because,

according to the summary of facts, "he was not 100% sure it was safe". But when the morning staff started their shift, a 'communication breakdown' meant the worker, who worked as a labour-hire on placement from a recruitment agency, was unaware of the potential risk.

He had only been working at the site for 10 weeks when the incident occurred.

On his feet that day were steel-capped 'safety shoes' brought from home that the worker said looked like sneakers. There was no safety chain in place when he began his shift and he entered the affected area at 7.30am. It took minutes for the worker to complete his task and shortly after he began to feel discomfort in one of his toes.

Assuming it was gout, a condition he suffered from, he went home to take medication as the ache worsened. He returned to work but at that stage, both of his feet were causing him agony.

The worker went home again and removed his shoes. Black blisters covered his feet and when he went to the hospital, an Emergency Department nurse immediately recognised his injuries.

"She just leaned over the counter and said to me straight away 'that's chemical burns,'" he recalled.

The wounds were washed and tested and returned readings on the highest end of the pH scale, which measures acidity in water. The worker did not understand the severity of the burns until he was told he might lose his toes and would need to learn to walk again. "I thought 'Oh, I'm not going home today'."

While the worker had spent just three-and-a-half minutes in the area of the spill, he spent more



than a week in hospital where he underwent invasive skin grafts and scraping.

He was released on Christmas Eve. Christmas Day was a struggle with little things like not being able to pick up his grandson for fear of falling over. "When he goes to bed at 7.30pm everybody gets a hug," The worker said. "I couldn't pick him up and he noticed that."

Following the incident, the once active grandfather was confined to the couch and visited by an ACC funded nurse multiple times a week. He had to take extreme care not to knock the skin grafts, and was unable to sleep in his bed for almost a month as he could not climb the stairs to reach his bedroom.

The worker lost the tips of both of his little toes and his balance was impacted.

He felt his recovery put pressure on his whanau who had to take leave from their jobs to assist him with daily tasks such as showering and using the bathroom.

When he returned to work six months later, the worker was the target of "ill-informed, negative comments" from his co-workers, the Judge said.

Time to move on

The worker said the memory of a family member who had died since the incident has inspired him in his recovery.

"When I got down and out he picked me up," he said. "He inspires me to get better. I want to get better not just for me but for him."

The worker no longer works for the manufacturer who has since closed their Wellington facility.

Dust: can we ignore it?

Haz substances kill rate 10 times the norm

Hazardous substances kill workers at 10 times the rate of workplace accidents. Chemicals cause much of the difficulties but asbestos and silicosis are proving to also be of grave concern. Today we consider the often forgotten subject of silicosis.

In 2018 a Worksafe speaker told a conference that New Zealand workers die 10 times more often from exposure to harmful substances than from accidents.

As the then Worksafe CEO Ms Rosie noted, in a *RNZ* report, that about 60 people die each year from accidents at work, but research carried out for Worksafe in 2012 showed that between 600 and 900 die each year from work-related illnesses.

While Workplace hazardous chemicals appear to be getting some control under the hazardous substance certification regime, asbestos and silicosis are often outside the existing hazardous substance regime with matching poor results.

Nicole Rosie said the number one killer was cancer linked to exposure from asbestos. "Second in there is silicosis, then exposure to other hazardous substances and fertilisers fit into this category.

She said that in 2018, New Zealand averaged 2.6 deaths per 100,000 workers annually in workplace incidents compared with 0.5 to 0.8 deaths per 100,000 workers in the UK and 1.5 deaths per 100,000 in Australia.

Ms Rosie said it was not correct that New Zealand had higher risk industries than others, but "all countries that have put a focus on health and safety have seen reductions in statistics. There is a method to improving health and safety and there's no reason why New Zealand can't be world-class."

A deadly dust

So how does silicosis fit into our accident statistics?

Silica is found in stone, rock, sand, clay and many building materials. When its dust is inhaled, it can cause scars in the lungs which makes it difficult to take in oxygen. The dust is also absorbed, causing damage around the body.

Silicosis, lung cancer, chronic obstructive pulmonary disease, kidney disease, autoimmune disorders and cardiovascular damage can be caused by silica dust.

The symptoms of silicosis may include a persistent cough, shortness of breath, fatigue and weight loss. These develop after exposure has already done significant damage. The health risks from dust created during stonemasonry, tunnelling and concreting have been known for more than a century.

However, more dangerous is dust from engineered stone (sometimes called reconstituted stone), which is a man-made composite of different materials held together by polymer resin.

This is because it contains up to 95



per cent silica, compared to 2 to 50 per cent in most natural stones. That concentration has fuelled an alarming rise in silicosis cases where the onset of symptoms is faster, sometimes within a year of exposure (silicosis developing within 10 years after first exposure is defined as accelerated silicosis.)

Among the first to make the connection were doctors working for Israel's National Lung Transplantation Programme who in a 2012 report realised that "a remarkable number of patients with life-threatening lung problems had worked with engineered stone".

The warning did little to slow the global rise of engineered stone, which as well as being budget-friendly, the man-made material is easier than granite or marble to acquire and fit, and more durable. However, as its use expanded, so too did the number of tradespersons breathing in silica dust – often with little understanding about the risks to their lungs and bodies.

Big numbers at risk

Big numbers are at risk: already in Australia, more than 600 people have been diagnosed with silicosis as a result of exposure to dust from engineered stone. In addition, the same exposure could cause up to

100 lung cancer cases, modelling by Curtin University in Perth estimates.

Health experts are increasingly worried about silicosis, a deadly lung disease caused by exposure to tiny particles of silica dust. And it is the workers of engineered stone, who are most effected.

Curtin University has estimated that 270,000 Australian workers are exposed to high levels of crystalline silica every day, and that 103,000 workers will be diagnosed with silicosis.

New Zealand health experts have been keeping a close eye on the situation in Australia, after realising it must also be going on under the radar here. WorkSafe estimates about 600 current and former workers in New Zealand who fabricate engineered stone, who are at risk and should get a health check.

However it is not always obvious that lung diseases may be caused by abnormal silica dust exposures and not until you are specifically asked about a patient's workplace exposures that doctors know it's that."

Similar issues were addressed with workplace paint solvent exposures

Engineered stone is a far less expensive material than actual natural stone. It is a mixture of real stone chip and requires less maintenance, but the manufacture of it and the manipulation of it into bench tops etc is being blamed for many deaths.

about 10 years ago when a high rate of cancers had been found in vehicle spray-painting operations during the "Gloves-off campaign", which are now included in annual Workplace hazardous substance reviews.

New Zealand imports about 60,000 engineered stone slabs a year, and WorkSafe estimates at least 132 businesses that fabricate them into benchtops.

In 2019 Worksafe issued 113 notices to 64 businesses, including 21 prohibition notices and 71 improvement notices. But the very next year it issued 166 notices to 75 businesses – just three prohibitions, but 115 improvement notices.

Overseas the levels of dust allowable in the air have been lowered, and New Zealand should also consider this so that all of our 'Workers come home safe!'

Uncle Archie

Kia ora HS professionals!

Artificial intelligence!

We have all met a few people who are very bright, but lack intelligence. Technology leaders have raised concern about the rapid rise of artificial intelligence (AI) in recent times as machine information processing speed and capacity starts to exceed that of the human brain.

This could be good, but also be a major problem where machines start to think for themselves but don't see the need to cater for their weak and feeble human hosts.

Global weirding and the cyclone zone

Up north the cold seas are gone, and the tropical cyclones are here! Flooding seems to have become the norm for west Auckland, Waihi, Esk valley, etc with 'Budget blowouts' to suit and only Wellington has been said to be in 'normal' weather! Must be all of that wind pushing the clouds along!

Big rains need big drains!

As hot air holds more water, like the tropics, warmer air drops more rain during the rainstorm. Many drains designed 100 years ago are too small for the more intense rainstorms causing flooding. Bigger pipe and drains may be/are required now!

We have a new King

The coronation of Charles III and his wife, Camilla, as king and queen of the United Kingdom and other Commonwealth realms, took place on 6 May, 2023, at Westminster Abbey. Charles acceded to the throne on 8 September, 2022, upon the death of his mother, Elizabeth II. We hope that Charles can be a great influencer like his mother!

Our Dame has departed

Shortly before Charles had his coronation another 'Royal icon', Dame Edna Everage, passed on to follow the Queen to the great showcase in the sky. Dame Edna, aka Australian Barry Humphries, was famous for his characters



Dame Edna and the impolite Sir Les Patterson. He died at 89 following health injuries from a broken hip and received many condolences including from the new King as he passed. Royalty may never quite be the same but then, "She'll be right, Possums!"

Hazsub certifiers

Compliance certifiers seem to be referring jobs through to each other which may be a sign of great cooperation, but perhaps also a sign that certifiers are all very busy. We of course hope that it is a sign of ongoing professional standards and co-operation.

Certifying reminder

Compliance certifiers have been formally reminded that in addition to just 'helping society against the adverse effects of hazardous substances', they should notify the authority when things don't appear to be being corrected and may perhaps go wrong.

Steel mill recycling and carbon cutting

The Government has announced a shared project with NZ Steel in which it will pay \$130 million towards a new arc-furnace. This

should cut 330 thousand cars' worth of CO₂ emissions as part of the steel-making process. As part of the deal NZ Steel will commence recycling! This should be a great help in reusing our planets resources.

Recycling ruckus

Unfortunately, a side effect of recycling large steel products, such as cars, is that there can sometimes be hidden batteries, fuel tanks, etc which can lead to fires in scrap piles as was seen at an Auckland scrap metal site recently

This 'fire' experience may become even more prevalent as lithium car batteries get recycled. So, while recycling of plastics, metals, etc will be critical to human survival, don't store recycled metal piles too close to the public or gas bottles.

Renewable energy storage

Sources of alternate renewable energy include the production of electricity through wind, waves, water or the sun. A major issue is how store the created energy for later use when the energy source may not be available. Oil-based fuels had an energy advantage in that oil-fuel stored its own energy. The safe and cheap storage of energy, such as batteries, dams, etc will be an issue with all fuel alternatives going forward.

Kindness and the wallet

Our 'Presi' has been banging on recently about kindness, and the professional spirit – perhaps he should be reminded that I kinda need a pay-rise!!

If you want to send your comment, you can send it to archie@NZIHSM.org.nz.

The ideas expressed in this column are not necessarily the views of the NZIHSM or Flashpoint and in some cases the NZIHSM frankly does not approve!



NZ Institute of Hazardous Substances Management (Inc)

MEMBERSHIP APPLICATION FORM

1. **Name:**
First Name Surname

2. **Employment:**
Business/Employer's Name:

Position and Contact Details:

Position Held:

Qualifications:

Experience in HS:
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.....
.....

3. **Preferred mailing address:**

Telephone Contacts: (Bus)

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Email: Web:

4. I have previously been a member of the Institute: Yes..... No
If No, I am applying to be a

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5. Return to: PO Box 10-385, The Terrace, Wellington
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