



**Meeting No. 144**  
**Wednesday, 2 December 2020**  
**9.00 a.m. – 10.30 a.m.**

**Inside Industry Visitor Centre**

## Minutes

Attendees	
<p><b>Community members</b> Ron Hales Philip Laird Peter Maywald Mark Peterlin</p> <p><b>Business Representatives</b> Andy Brownjohn – BOC Gases Michael Graham – Pacific National Nigel Harpley – Ixom Brian Kiely – PK Gateway Dene Ladmore – Quattro Ports Dylan Clarkson – GrainCorp Luke Pascot- PK Coal Terminal Cherie Sammut – BlueScope Lorrie Zammit – BlueScope Greg Newman – EPA Marika Calfas – NSW Ports</p> <p><b>University of Wollongong</b> None present</p> <p><b>NSW Ports representatives</b> Trevor Brown Sarah Downey</p> <p><b>Port Authority of NSW</b> None present</p>	<p><b>Wollongong City Council</b> None present</p> <p><b>Dept of Agriculture</b> None present</p> <p>Chris Haley – Chairperson Natalie Murphy – Minute Taker</p> <p><b>Apologies</b> Vida Cheeseman – NSW Ports Sharad Basin – Port Authority of NSW Paul Bollen – Morgan Cement Evan Wissell – AAT Michael Curley - PKCT Brendan Moss- GrainCorp Allison Broad – UoW Andy David - UoW John Morrison – UoW Luke Pascot – PKCT Doyle Cook – PKGateway Michael Graham – PN Cory Page - LINX Robyn Simpson – LINX Renee Winsor – Wollongong City Council</p>

1. **Introduction & Apologies:** Chris Haley welcomed attendees to the meeting and noted apologies.
  
2. **Presentation – NSW Ports CEO update – Marika Calfas**
  - NSW Ports manages two ports - Port Botany and Port Kembla and two rail intermodal terminals, one at Cooks River (8km from Port Botany) and Enfield (18 km from Port Botany), both on dedicated freight rail. Our two ports handle very different trades and have different operating environments.
  - Overview of trades handled by NSW Ports' assets – Port Botany is very much a container port and bulk liquids, mostly refined fuels and gas. Port Kembla is Ro-Ro (Roll on Roll off) motor vehicles, agricultural bulk, mineral bulk, construction bulk materials and mining as well. And when it comes to the future it will be a gas port also.
  - NSW Ports manages the two ports in similar ways – we don't handle the trade. We lease the land to stevedores and other operators who manage the transfer of cargo to and from the ships, in addition to managing the storage of cargo.
  - We do have some operational components to our role – in that we manage the common user berths at our ports, but to this end we don't load and unload the ships. We are responsible for wharf infrastructure, channel and berth depths, common road and rail infrastructure and landside security on common user land (not within the terminals).
  - NSW Ports' role differs from the role of port operators. Important to note the distinction with the Port Authority of NSW (a government entity) – they manage the waterside component (security, safety and pilotage). NSW Ports manages the land and infrastructure of the port, acting as landlord and port developer.
  - Economic contribution: collectively the two ports contribute \$4.4 billion to NSW Gross State Product. Port Kembla adds \$540 million to Gross Regional Product. Both ports collectively employ about 30,000 people and in Port Kembla 99% of port workers live locally. The ports are good local employers.
  - COVID-19 has presented a whole range of challenges, some which we had not previously faced. An example of this includes the different maritime trade rules at the Commonwealth and the state level, as well as differing rules between states. In addition, as shipping is largely a global operation, this too added significant complexity to the management of worker safety and the efficient servicing of vessels. Some of the earlier restrictions regarding shipping operations were quite stringent to the point of impacting on the crew's ability to service the ships effectively. Prior to the updating of the state imposed public health orders which prevented crew disembarkation for example, approx. 1000 ship movements needed to seek special exemptions to carry out essential activities relating to the loading and unloading of cargo. Despite the incredible challenges, ports have continued to be very resilient and operate well 24/7.
  - Australia is in a good position now as regards COVID however at the beginning of COVID, it was very challenging to work through the differing rules. The Government and public now have a better understanding of the importance of shipping and freight. Need to use that understanding to get the changes we need for better operations of the ports. There have been some good examples of short-term planning changes as a result of the greater understanding of the importance of the supply chain industries. One example of this includes the temporary removal of curfews for freight deliveries, to help with ensuring the efficient delivery of goods due to increased demand during the height of the pandemic earlier this year. Pleasingly this remains in place.
  - Trade has broadly remained consistent across the board for the most part. Motor vehicles have been soft (a continued trend, not necessarily COVID related, but of course it wouldn't have helped). For AAT there's been a shift towards large amounts of project and general cargo e.g.: Bango windfarm components, Snowy Hydro equipment, rail carriages etc.

- Despite COVID, NSW Ports has continued its capital investment program and it appears to be the case also for our tenants which is good news for investment in our ports.
- Grain – expecting a good harvest. Expecting grain shipments very soon.
- Out of interest, related to Port Botany, refined fuel (petrol and jet fuel) is down but diesel is up (farmer related). From a container perspective there's been an increase in disinfectant imports, and electronics e.g.: computer monitors, most likely linked to more people working from home. Container activity has for the most part, matched what is happening as a result of the pandemic.
- Future – You will have heard that NSW Ports recently signed a long-term lease with Australian Industrial Energy (AIE) for a Liquefied Natural Gas (LNG) import facility into Port Kembla, to be housed at berth 101 and this presents a great new diversified trade for the port. This development will bring more shipping movements helping to sustain shipping support services such as towage and pilotage operations in the port. Also, there is strong potential to link into a hydrogen power station which AIE are very keen to pursue. We continue to look for new opportunities and this is an example of one which has been a two-year journey for our team. Initial works are due to start soon.
- We are in continued talks with other parties with regards to bringing new trades into Port Kembla and we continue to plan for the long-term future around containers in Port Kembla.
- We are strong supporters of the Illawarra Business Chamber's efforts with regards to the road and rail access initiatives e.g.: Picton Road and Mount Ousley Road as well as the recent launch of the SWIRL report.
- Finally, hopefully you will have seen we've improved our website this year and have taken your valued feedback into account. We've also recently launched our Facebook page and I have it on good authority that our stories relating to Port Kembla receive our best engagement scores.

**Q: PL:** Please outline the initiatives underway to get more containers on rail and will the use of HPVs be supportive of the efforts to get more on rail?

**A: MC:** There are a couple of initiatives underway to get more containers on rail at Port Botany. NSW Ports can best influence this goal by increasing the capacity for rail. We are investing in capacity inside each of the rail terminals at Port Botany, in partnership with the terminal operators. This will result in each of the three terminals having a 1 million TEU capacity on dock rail terminal facility following completion of this project. Stage 1 is well underway at Patrick's Sydney Terminal. DP World and Hutchison will follow when they are ready to invest. This gives us significant capacity at the port and is being matched by gradual investment in rail capacity through the freight rail system and the intermodal terminals. NSW Ports continues to invest in capacity at our Enfield terminal and various other intermodal terminals are well under way. All the investment which has been going on since the freight industry advisory board released their plan in 2005 is now starting to reach a point where it's providing the impetus for the shift to rail mode share. We think HPV are going to be necessary as container numbers are going to increase over time. We want to mitigate the growth in the number of the trucks on the roads and the only way we can do that is to have a shift to rail but also to have better productivity on the roads – through the use of HPVs but also the better utilisation of those vehicles (i.e.: loaded in both directions).

The key thinking needs to be in ensuring the encouragement of rail shift and ensuring it's not disadvantaged against the HPVs at the early phases. Rail in and of itself has some advantages over road and it will grow as usage is taken up.

**Q: MP:** What were the nature of the industrial disputes? I am led to believe there were no COVID-19 planning in place by the stevedoring companies and the workers were asking for this. Is it true that the lack of processes in place for COVID was the reason for the dispute?

**A: MC:** Not the core of the industrial dispute that caused significant disruption in the supply chain. It's true that there was significant uncertainty and anxiety around COVID when it first came about. There were lots of questions about the best ways in which to protect workers. We had weekly phone meetings with port operators and government agencies to share information and challenges to ensure we came up with workable solutions to keep trade flowing as well as to protect workers. The initial concerns about worker safety were relatively short term and had less of an impact to the supply chains than the September industrial action. The cause of the industrial concern was that all three stevedores were off their EBAs in September 2020 and were going through industrial action at the same time. Usually if one operator is disrupted, then the other operators can pick up the slack. With all three operators going through a period of disruption at the same time caused significant impacts including congestion, large backlogs, supply chain backups etc.

**Q: MP:** Is there a proposed site for a hydrogen facility?

**A: MC:** No not that I am aware of where AIE have located. The ideal is it's in the Port Kembla area due to good access to water and the pipeline too. AIE have indicated they'd like to use LNG and hydrogen as a hybrid feedstock for a power station and this forms part of their discussions with the government regarding the energy underwriting scheme. This project is contingent on energy policy in NSW and at the commonwealth level.

**Q: RH:** Is there an easy resolution to the issue between the security of that area generally and the public access of the foreshore? (referring to Seawall Road)

**A: MC:** Thank you for your question - This is at the top of our minds. We are looking at how we can best facilitate public access with the potential risks that go along with mixing people and private cars with trucks. Also looking at what it means for the gas terminal and their requirements in order to be able to operate. Unfortunately, there is no answer to that right now, but we are very conscious of it and want to get the best possible outcome around access and public safety. We cannot guarantee that it will mean ongoing access to the breakwater at the end of Seawall Road. But we are looking at options for better access to the beach in this area.

**CH:** Thank you for your time. Can the group send some other questions through following your update?

**A: MC:** Yes, that is fine – please get in touch via my team or via Chris the Chair.

### **3. Key Initiatives and Actions: Refer to Appendix A – TB**

- Prepare Sustainable Development Guideline – In progress
- Prepare NSW Ports Sustainability Plan 2018 - Complete
- Collate Port Kembla Stormwater / Wastewater management information -Complete
- Guideline for Stormwater / Wastewater Management – To be included with Sustainable Management Guide
- Coordinated action for illegal dumping and litter reduction – Complete
- Assess feasibility of Allan's Creek Litter Boom – pending funding
- Coordinated plan for weed and feral pest control – In Progress
- Research towards sustainable anchorage practices – Phase 1, habitat identification – Complete
- Develop educational resources for schools regarding ports – Not progressing
- Develop educational resources for schools regarding ports – Complete with ongoing improvements

### **4. Climate Change**

#### **4.1 Proposed discussion topic for first meeting of 2021 – CH**

CH: There are commercial organisations that are members of this group. State government has a policy to reduce CO<sub>2</sub> emissions to reduce to net zero by 2050.  
**ACTION:** Would like to hear how each of the commercial organisations are going to reduce CO<sub>2</sub> emissions by 2050, either personally or at the next meeting in February.

**Q: MP:** Could we prompt council for a response re: Allan's creek  
**ACTION:** Trevor Brown to follow up

**PL:** Extreme weather events and reducing emissions. A lot to think about.

## 5. Legislation and Policy

### 5.1 Marine Pollution Amendment (Review) Bill 2020

- **LZ:** No changes that affect Port Kembla. Change to Vic legislation but will not flow onto NSW
- **SD:** The details relating to this amendment were posted in the private LinkedIn group. Please contact Sarah if you require assistance with the LinkedIn group.
- **TB:** Marine Pollution Act is a state parliament act aiming to give effect to IMO conventions around environmental impacts of shipping i.e. sewerage mgt, waste mgt, waste from scrubbers. Ensuring shipping stays in line with IMO as it evolves. Review was done 2019 and there was an amendment.
- **Post Meeting Note:** According to the Parliament of NSW website, the Marine Pollution Amendment (Review) Bill 2020 has been passed by the Legislative Assembly and is currently before the legislative Council. According to the Explanatory Note provided the objects of this Bill are to amend the Marine Pollution Act 2012 (the Act) to—
  - (a) address recommendations of the 2019 statutory review of the Marine Pollution Act 2012, and
  - (b) ensure consistency between the Act, the Protection of the Sea (Prevention of Pollution from Ships) Act 1983 of the Commonwealth and the International Convention for the Prevention of Pollution from Ships (MARPOL), and
  - (c) provide for enforcement powers about the maintenance of sewage pollution prevention equipment, and
  - (d) provide for preventative action against marine pollution in relation to abandoned, derelict or out-of-commission vessels, and
  - (e) make other minor and consequential amendments.
  - For further details refer to <https://www.parliament.nsw.gov.au/bills/Pages/Profiles/marine-pollution-amendment-review-bill-2020.aspx>

## 6. Round Table Reports (update on Harbour related information)

**Including:**

### 6.1 EPA update on media reports regarding water contamination, flowing into PK Harbour – GN: Appendix B

- Darcy road water samples. Sample results this week. See presentation, Appendix B.

**ACTION:** GN to provide an update on the work that has happened at the copper site and what is still going on there now. What is happening – future plans for that site?

- AIE have offered to come and present to the group in February if there is interest
- GN & EPA rep are working on the water samples and will present at the April meeting

## **6.2 PK Gateway: BK**

- Resealed area adjacent to rail siding with bitumen to reduce dust.
- Dry fog system has been fully commissioned and working for the last 2 months.

**ACTION:** BK to bring in video to show the group. Dry fog is also being used in Adelaide Port and Townsville.

## **6.3 Quattro & GrainCorp – GrainCorp terminal 2020 harvest updates – DL & BM**

- GrainCorp – Lots of publicity about exporting again. Looking at 1.5-2 mill tonne exporting. Rail movements are happening
- Still shipping through Brisbane – southern QLD has had a good harvest and will export out of that area. Supply and demand moving into different markets.
- Shipping to start Tuesday next week.  
A lot of grain on farms that needs to get onto trains

## **6.4 IXOM: NH**

- Soft demand during the year but picking up
- Shut down middle of year May to mid Oct as couldn't get equipment needed
- Temporary fencing on Foreshore Road as the fence came down.

## **6.5 NSW Ports: TB**

### **AIE Gas Terminal Development**

- Gas terminal development – working through process of reviewing mgt plan of construction process. Initial works essential. PKCT relinquishing berth 101 and associated stormwater infrastructure and dust monitoring around that area.
- NSW Ports are assisting the Coal Terminal to relinquish the licence of that site. Construction of gas terminal will start next year

**Q: PL:** Any cooling of gas terminal

**A: TB:** No

### **Environment Shipping Incentive Update:**

- The incentive rewards vessels whose emissions performance is lower, better energy efficiency. Ships with emissions that are lower than IMO requirements receive incentives from NSW Ports. The proportion of vessel visits receiving rebates has increased to 26% under that scheme. Reviewing the scheme moving forward.

**ACTION:** TB to provide an update later.

### **Vegetation Restoration Program**

- Reclamation works to offset loss of wetland in Outer Harbour. Working on an offset package. More detail to come at the February meeting.
- **Q: PL:** Vegetation program is for the Harbour?
- **A: TB:** No real scope for vegetation or habitat in the harbour so looking at surrounding areas to offset.

## **7 General Business**

### **7.1 Actions from previous meeting**

- Nothing noted

### **7.2 Marketing and Communications - SD**

- As Marika mentioned we've boosted out community communications channels this year with the launch of our new website and Facebook. It is much easier to get news and new content notifications from our new website – any news and/or updates gets sent to your email. Sign up on the Contact Us page.
- Focusing next year on the role of the Port and working on some programs around that. We are interested in your feedback on how these meetings are going, or any

topics you are interested in hearing about in this forum. Corporate Affairs will send a survey for completion in relation to this and we'd appreciate your input.

- In 2021 we will be launching a new community grants program.
- Finally, we are working with the local Mission to Seafarers branch on some gift packs for seafarers to be distributed on Christmas Eve. Please contact Sarah if you feel your business could help in some way.

### **7.3 New Business**

#### **Public Access to Northern Breakwater – CH, TB**

- Eastern break water is still open. Heritage park looks great

#### **Stormwater controls – PM, TB**

- **Q: PM:** Agencies involved can indicate where the pollution traps are but how often those traps are cleaned?
- **A: TB:** Port traps are cleaned every 2 years by NSW Ports. Might need to pursue through council storm water quality controls for the wider catchment
- **RH:** There is a works program and checked out periodically in normal weather but in bad weather would be required more.
- **Q: LZ:** What part of the port are you talking about?
- **A: TB** has a map of the Port and storm water outlets for viewing

**ACTION:** TB to go back through the minutes earlier this year re: Isabelle from Wollongong City Council presentation.

#### **Traffic management and new developments – PM, TB**

- **PM:** How are the developments around the harbour going to affect the traffic for the community? – just a comment rather than a question

#### **NSW Budget outcome for transport infrastructure links to PK – PL, SD**

- No response from the State Government or Council.

**ACTION:** PL to Draft letter to Illawarra business chamber

**ACTION:** PL Draft letter to state government for Illawarra infrastructure grant

#### **Rail Corp Cargo – PL, TB**

- **TB-** 2020 handled 3.1mil tonnes on rail. A decrease in coal.

#### **Document formerly held on PKHEG website – CH, SD**

- There are a few old university research studies which can be made available to the group if there is interest. Sarah asked the group if there was interest and there was no response. Sarah will work with Chris on a workable solution based on this feedback.

**ACTION:** SD and CH to discuss drop box as option.

#### **Amendment to last minutes dated 7 October 2020.**

- Noted that Lorrie Zammit was marked as an attendance but was an apology.

#### **Appendix C: Chris Haley attached some additional information for reading**

- Cybercrime
- Plastic Waste Reduction
- Recycling Process

**1. Next Meeting:**

**DATE:** 10 February 2021  
**VENUE:** TBC  
**TIME:** 9.00 a.m. to 10.30 a.m.

RSVP: Sarah Downey on Telephone: 9316 1120  
or E-mail [sarah.downey@nswports.com.au](mailto:sarah.downey@nswports.com.au)

**APPENDIX A**

**Port Kembla Harbour Environment Group**

**Key Initiatives and Actions 2018-2020 as at December 2020**

<b>Initiative/ Action</b>	<b>Responsibility</b>	<b>Expected Completion</b>	<b>Status</b>
<b>1. Planning for Sustainability</b>			
1.1. Prepare Sustainable Development Guideline	NSW Ports	Jun 2021	In progress
1.2. Prepare NSW Ports Sustainability Plan 2018	NSW Ports	Aug 2019	Complete
<b>2. Stormwater / Wastewater Management</b>			
2.1. Collate Port Kembla Stormwater / Wastewater management information	NSW Ports & tenants	April 2020	Complete
2.2. Guideline for Stormwater / Wastewater Management	NSW Ports	Jun 2021	To be included within Sustainable Development Guideline
<b>3. Illegal Dumping and Litter Reduction</b>			
3.1. Coordinated action for illegal dumping and litter reduction	NSW Ports & tenants	June 2019	Complete
3.2. Assess feasibility of Allans Creek Litter Boom	Council	TBA	Pending funding and resources to assess feasibility
<b>4. Weeds and Pest Control</b>			
4.1. Coordinated plan for weed and feral pest control	NSW Ports & tenants	June 2021	In progress
<b>5. Conserve the marine environment</b>			
5.1. Research towards sustainable anchorage practices – Phase 1, habitat identification	UoW, NSW Ports	Feb 2019	Complete
<b>6. Promote awareness of Port Kembla and its environment</b>			
6.1. Develop educational resources for schools regarding ports	NSW Ports	Apr 2019	Not progressing - in lieu of the school education program, we have focused our efforts on: <ul style="list-style-type: none"> <li>- Investing in school programs and partnerships, including Permaculture Partners program</li> <li>- Creating a range of easily accessible information, video content and photo libraries (now live on the website)</li> <li>- Planning for a Port Kembla “port open day” in 2022.</li> <li>- Launching facebook with a steady stream of content</li> <li>- Ongoing media coverage of the port and the various initiatives underway.</li> </ul>
6.2. PKHEG website	All members	TBA	Alternate proposals to: <ul style="list-style-type: none"> <li>- include materials on NSW Ports website; and</li> <li>- establish a LinkedIn group for sharing reports, research articles, etc among the group</li> </ul>

# Cybercrime

Recently the four largest container carriers were attacked:

1. June 2017, A.P. Møller–Maersk, No. 1, was debilitated by a cyberattack that impacted its bottom line by approximately \$300 million.
2. No. 3 COSCO was hit in July 2018 in a cyberattack that resulted in network failures in the United States, Canada, Panama, Argentina, Brazil, Peru, Chile, and Uruguay.
3. No. 2 Mediterranean Shipping Co. (MSC) was knocked offline for five days in April 2020. The network outage was a malware attack that affected digital tools, including msc.com and my MSC.
4. No. 4 CMA CGM is the latest container shipping line to be hit with a ransomware cyberattack in September 2020

## Plastic Waste Reduction

PKHEG has expressed its concern previously about the level of plastic reaching the oceans around Australia and elsewhere in the world. There are some techniques that you personally can use to reduce the amount of plastics that are used – some of these are mentioned below.

Our beautiful oceans are part of our collective heritage. Every time we refuse to use a piece of plastic, it is one small victory for our marine life — but we need to pressure governments and corporations to act too.

Oceans are fundamental to our lives on earth – the lungs of our planet. But the balance of life within our oceans is delicate. Right now, plastic bags, plastic bottles and micro-plastics are choking Australian sea life and clogging our marine ecosystems.

With one simple decision — to reduce the amount of plastic we use in our daily lives — we can turn the tide on plastic pollution and give our majestic sea creatures a healthier future. Did you know the average plastic bag is used for 12 minutes but essentially lasts forever? You can avoid plastic bags easily:

- Say yes to reusable bags and bring your own from home
- Shop at local markets and don't use plastic bags for loose vegetables – take your own reusable, washable **Onya bags**, or paper bags
- Support your local clean/bulk foods store

Plastic packaging in the supermarket is rampant, whether it's fresh fruit on a styrofoam tray, wrapped in cling wrap, plastic squeeze bottles or over-packaged lunch options for kids. It does not have to be this way:

- Choose the unwrapped produce where you can
- Bring your own veggie bags from home
- Choose bulk products where possible
- Choose glass bottles or buy containers only where they are made from recycled plastic
- Sign petitions to reduce or ban plastic packaging in supermarkets

Australians use 1 billion “disposable” coffee cups a year and millions of straws. But the coffee cups have a plastic lining and can't be recycled and the straws end up in the ocean and are eaten by unsuspecting fish. You can turn the tide:

- Remember to bring your own reusable cup;
- Some cafes will let you bring your own mug;
- Introduce your local cafe to '**Responsible Cafes**' and start saving money on each drink!
- Say no to plastic straws. Either bring your own metal straw or just drink from the bottle or glass

## Plastic recycling

We've all seen the recycling symbol on plastics. But remember the guide is reduce, reuse, recycle — in that order of priority. First, think about whether you really need the plastic or if there's another option; then choose to reuse the plastic product as many times as you can, including buying products that are already recycled; then buy a new product and recycle it if there are no other options.

- Check for the recycling symbol on all plastics you purchase and don't buy the product if there isn't one
- Take plastic bottles back to redeem the container deposit if you live in a state that has a container deposit scheme, and help campaign to introduce a scheme to Victoria & Tasmania
- Look for a program like **RedCycle** in your state that will recycle post-consumer soft plastic waste like plastic bags and bread wrappers into large-scale recycled products like fenceposts and bridges
- If you are a company buying large scale plastic such as signage, check whether there is a commercial recycler who will buy your materials from you when your campaign is finished.

Source <https://www.marineconservation.org.au/how-to-reduce-plastic-use/>

## Plastic Use in the World

This week, Great Britain's Royal Statistical Society announced **its statistic of the year**. It's 90.5%, the estimated amount of plastic waste ever made that has never been recycled. Estimated at 6,300 million metric tonnes, scientists calculated that around 12 percent of all plastic waste has been incinerated, while roughly 79 percent has found its way into landfills or become litter. That fact comes from a study published in Science Advances, "Production, Use, and Fate of all plastics ever made," by scientists Roland Geyer, Jenna Jambeck.

"We all knew there was a rapid and extreme increase in plastic production from 1950 until now, but actually quantifying the cumulative number for all plastic ever made was quite shocking," Jambeck,

The pdf file can be downloaded here:

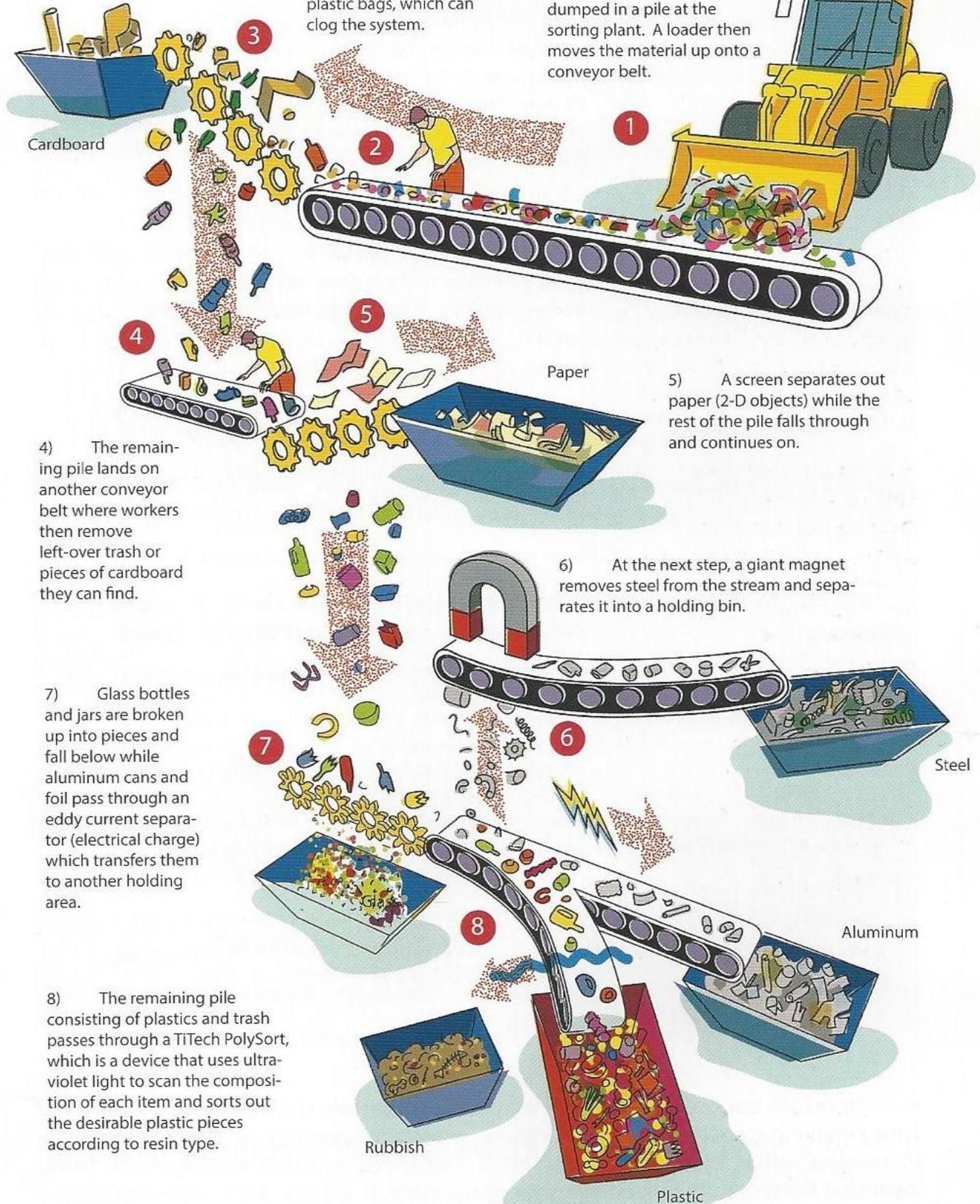
[https://www.researchgate.net/publication/318567844\\_Production\\_use\\_and\\_fate\\_of\\_all\\_plastics\\_ever\\_made](https://www.researchgate.net/publication/318567844_Production_use_and_fate_of_all_plastics_ever_made)

# THE RECYCLING PROCESS

3) Using rotating discs, cardboard is separated from the pile while smaller objects fall through and continue on.

2) Workers then proceed to remove trash, bulky items and plastic bags, which can clog the system.

1) Recyclables are dumped in a pile at the sorting plant. A loader then moves the material up onto a conveyor belt.



4) The remaining pile lands on another conveyor belt where workers then remove left-over trash or pieces of cardboard they can find.

5) A screen separates out paper (2-D objects) while the rest of the pile falls through and continues on.

6) At the next step, a giant magnet removes steel from the stream and separates it into a holding bin.

7) Glass bottles and jars are broken up into pieces and fall below while aluminum cans and foil pass through an eddy current separator (electrical charge) which transfers them to another holding area.

8) The remaining pile consisting of plastics and trash passes through a TiTech PolySort, which is a device that uses ultraviolet light to scan the composition of each item and sorts out the desirable plastic pieces according to resin type.